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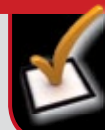
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SHUBHENDU
PARTH

[OPENING NOTE]

Gear up for the next wave of connectivity and innovation

In India's ever-changing tech landscape, 2024 promises an exciting wave of new-generation connectivity, poised to redefine how people and businesses will experience the digital world. Leading these transformative trends is the 5G technology rollout, which is set to revolutionise communication.

Beyond delivering faster and more reliable connectivity, this advancement lays the foundation for the widespread adoption of emerging technologies such as Augmented Reality (AR) and Virtual Reality (VR). With the proliferation of 5G networks, the anticipation is for a communication experience that will seamlessly integrate into our lives, fostering innovation across diverse industries.

Artificial Intelligence (AI), once a distant concept, is set to seamlessly weave itself into the fabric of daily life in 2024. The year is likely to witness AI playing a more significant role in communication, ushering in personalised and intelligent interactions. From chatbots providing instant customer support to AI-driven content curation, the integration of AI technologies is expected to elevate efficiency, accuracy, and the overall user experience within communication platforms.

The sophistication of cyber threats has underscored the paramount need for secure communication, giving rise to the fascinating realm of quantum communication. Leveraging the principles of quantum mechanics, this technology promises unbreakable encryption and heightened security. Anticipated advancements in quantum key distribution and quantum-resistant cryptography in 2024 herald a new era of secure and confidential communication.

Besides, the rise of edge computing is likely to redefine the architecture of how data will be processed and delivered. Bringing computing closer to the data source will help minimise latency and enhance the speed of communication, particularly crucial for applications requiring real-time responsiveness, such as remote surgery, telemedicine, and the use of sensor-based technologies for smart cities, smart agriculture, and Industry 4.0 applications.

Extended Reality (XR), an umbrella term encompassing AR, VR, and mixed reality, is set to redefine the parameters of how digital content will be perceived and engaged. In 2024, communication platforms are poised to leverage XR technologies, crafting immersive virtual environments conducive to remote collaboration, training simulations, and virtual social interactions. This shift towards virtual presence holds the potential to bridge geographical gaps and elevate the overall sense of connectedness.

Amidst this whirlwind of technological strides, sustainability emerges as a central guiding theme. The tech industry's commitment to sustainability, spanning from optimising supply chains to integrating AI-driven efficiency measures, positions itself as a transformative force for sustainable solutions. This commitment must seamlessly align with global regulations on climate change, underscoring the pivotal role of technology in mitigating environmental impact.

As we stand on the threshold of 2024, the communication sector is geared up for a transformative journey, a symphony of innovation and interconnected intelligence. Embracing these technological innovations will not merely redefine how communication takes place but will pave the way for a future that is both interconnected and intelligent. The road ahead is thrilling, and as we navigate the horizon of technological progress, let us remain vigilant and open to the boundless possibilities that these trends will bring to the world of communication.

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It's time for Telecom to go green

Green telecom aligns progress with environmental responsibility, ensuring a sustainable future for India's booming telecommunications sector



BY TR DUA

India stands as the world's second-largest telecommunications market, boasting a rapidly expanding network infrastructure and a massive consumer base. The country has made significant strides in extending the reach of telecommunications services, providing access to millions of people nationwide. Nonetheless, challenges persist, including the need to enhance network quality, increase broadband penetration, and promote digital literacy.

Over the past few decades, two overarching forces, namely, technology and the environment, have converged into a symbiotic predicament. The integration of technology without due consideration for the environment may lead to undue strain, just as the environment cannot be protected and rejuvenated without leveraging technological feats.

The country currently has over 7.7 lakh towers, each housing an average of 2-3 base transceiver stations (BTSs) from various telecommunications companies. Despite significant progress in grid availability and expansion into rural areas, approximately 35-40% of sites still rely on diesel generators as backup sources. Notably, telecom companies have undertaken efforts and conducted trials to make solar power solutions economically viable.

Keeping in tune with the global focus on climate change, it was imperative to undertake measures that would safeguard India's environmental resources while maintaining steadfast progress in technological advancements. The inception of Green Telecom is seen as a key solution to the interplay between technology and the environment.

Despite significant progress in grid availability and expansion into rural areas, nearly 35-40% of sites rely on diesel generators as backup sources.

IN BRIEF

- India, the second-largest telecom market, grapples with 35-40% reliance on diesel backup, prompting green telecom initiatives.
- Government policies, including TRAI recommendations and NDC, advocate voluntary adoption of Renewable Energy Technologies for telecom.
- Telecom operators' shift to renewable sources, like solar and wind, can help in reducing carbon emissions and operational costs.
- India excels in renewable energy deployment, with solar capacity exceeding 70 GW, wind surpassing 43 GW, and biomass contributing over 10 GW.
- Despite progress, challenges like grid integration and land acquisition persist, but India targets 500 GW of renewable energy by 2030.



For telecom operators, adopting green practices has become imperative as energy costs constitute approximately 30% of the operational expenditure. The rise in diesel prices, coupled with environmental concerns regarding greenhouse gas emissions, has prompted government authorities to swiftly introduce provisions for non-conventional energy sources such as solar and wind power, both for remote off-grid sites and grid-connected sites.

GOVERNMENT INITIATIVES

The Government of India has played a crucial role in promoting renewable energy development. The Ministry of New and Renewable Energy has implemented various policies and programmes aimed at encouraging investment in renewable energy projects. These initiatives have provided financial support, tax benefits, and regulatory frameworks that have significantly driven the growth of the sector.

In 2017, the Telecom Regulatory Authority of India (TRAI) recommended that the adoption of Renewable Energy Technologies (RET) should be made voluntarily, considering the feasibility and viability of RET deployment. Additionally, TRAI proposed a Carbon Credit policy and recognition of RET deployment as a measure of reducing overall carbon emissions.

As a result of the TRAI recommendations, made in consultation with various industry bodies, the Department of Telecommunications announced revised voluntary measures for sustainable telecom practices. These measures establish the voluntary nature of RET targets, a commitment to achieving a 40% reduction in carbon emissions by the end of 2022, mandatory reporting on carbon footprint per user, and the implementation of a Carbon Credit Policy requiring a 50% reduction in carbon footprint for rural areas and a 66% reduction for urban areas.

India's National Digital Communications (NDC) Policy 2018 advocates for the digital communications sector to embrace alternative energy sources, including fuel cells and Li-ion batteries, while simultaneously engaging in research and development initiatives to explore additional energy options. Overall, renewable energy, sources such as solar, wind, hydro, and geothermal power are gaining cost competitiveness and expanding their presence within the energy mix. The evolution of energy storage technologies offers promising solutions to address intermittency challenges associated with renewable sources.

To increase the adoption of renewable energy, strategies include transforming the grid supply across states into green energy, thereby reducing the carbon emission factor. Additionally, there is a push for a mandatory share of renewable power usage throughout the network. A defined roadmap outlines the trajectory towards achieving 100% utilisation of renewable power, aligning with the goals outlined in the NDC.

GREEN TELECOMMUNICATION

In recent years, India has actively pursued initiatives to promote green telecommunications. The government, in collaboration with the telecom service providers and infrastructure providers, has implemented various measures aimed at reducing the carbon footprint within the telecommunications sector.

Telecom companies have been incentivised to transition from conventional energy sources to renewable

Continuous efforts by telecom infrastructure providers have led to an annual saving of approximately 550 million litres of diesel in India.

alternatives. Numerous companies have commenced the installation of solar panels, wind turbines, and fuel cells to power their cell towers and other infrastructure. This strategic shift reduces dependence on fossil fuels and contributes to a significant reduction in carbon emissions.

Continuous efforts by telecom infrastructure providers have resulted in a substantial reduction in diesel consumption at sites. Presently, approximately 30% of the sites are diesel-free. The number of such sites has seen a remarkable increase, reaching 2,23,913 as of June 2023, compared to 90,911 sites in December 2016. Consequently, there has been an annual saving of approximately 550 million litres of diesel.

INDUSTRY SCENARIO

India stands among the global leaders in the deployment of renewable energy, showcasing significant progress over the past decade and ranking as the fourth-largest producer of renewable energy worldwide.

Solar power takes the forefront as the most prominent renewable energy source in India, boasting an installed capacity exceeding 70 GW as of July 2023. The country's ample solar resources make it an ideal location for solar energy generation, with expectations to surpass 100 GW by 2025.

Wind power is another major contributor to India's renewable energy portfolio, with an installed capacity surpassing 43 GW. Favourable wind conditions in various regions, particularly along the coast and in the western states, contribute to this substantial capacity. The anticipated trajectory indicates India's wind power capacity is expected to reach 60 GW by 2025.

Similarly, Small hydropower (SHP) has emerged as a significant renewable energy source in the country, particularly in hilly and mountainous regions. Recognised for its cleanliness and renewability, SHP boasts an installed capacity exceeding 4 GW. Besides, biomass energy, derived from organic materials like agricultural waste and forestry residues, holds importance as another renewable energy source in India.

Biomass finds applications in electricity generation, heating, and cooking. The country's biomass power

capacity exceeds 10 GW, contributing to India's diverse and robust renewable energy landscape.

CHALLENGES AND FUTURE OUTLOOK

Despite notable progress, India encounters challenges in its renewable energy journey, encompassing grid integration issues, land acquisition problems, storage limitations, and access to finance for smaller projects. The government is tasked with addressing these hurdles to further expedite the deployment of renewable energy in the country.

India has established ambitious targets, aiming to reduce the carbon intensity of the nation's economy by less than 45% by the end of the decade. Additionally, the country strives to achieve 50% cumulative electric power installed by 2030 from renewables and attain net-zero carbon emissions by 2070. The grand vision includes reaching 500 GW of installed renewable energy capacity by 2030.

Furthering this commitment, India aims to produce five million tonnes of green hydrogen by 2030, bolstered by 125 GW of renewable energy capacity. Notably, 57 solar parks with an aggregate capacity of 39.28 GW have received approval in India. The wind energy sector targets 30 GW from offshore sources by 2030, with potential sites already identified.

As of July 2023, renewable energy sources, including large hydropower, collectively contribute to an installed capacity of 176.49 GW. These targets align with the country's commitment to global climate change mitigation efforts.

With robust policy support, abundant resources, and advancing technological capabilities, India stands poised to emerge as a global leader in renewable energy development. The country's success in this sector carries significant implications for energy security, economic growth, and environmental sustainability. 🌱

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KEY DISCUSSION POINTS

- Connected Future
- 5G and Beyond
- Satcom Innovations
- Monetization and User Experience
- Threats and Countermeasures
- Digital Transformation
- IoT in Business
- Real-world Applications
- Sustainable Connectivity

KEY HIGHLIGHTS

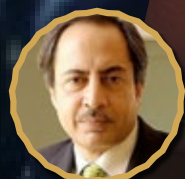
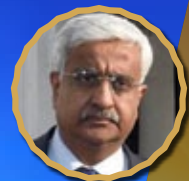
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HALL OF FAME
TELECOM PERSON
OF THE YEAR



Navigating the crossroads of connectivity

Communication service provider CIOs have a plethora of challenges to deal with in 2024. Here is a list of 10 key challenges and solution



BY RAJ GUMMADAPU

The telecommunications industry is currently at a crucial juncture, undergoing significant transformations due to the intersection of groundbreaking technologies and evolving customer needs. In this landscape, where businesses increasingly depend on seamless connectivity and communication, the role of telecom Chief Information Officers (CIOs) has become exceptionally vital.

Looking into 2024, these CIOs are poised to confront a distinctive array of challenges, encompassing the complexities of technological advancements, shifts in regulations, and the ever-changing expectations of customers. The challenges they face are diverse, ranging from managing cyber threats and addressing the exponential growth of data to scaling network infrastructure and ensuring sustainable operations.

CIOs must prioritise cybersecurity, implementing robust authentication, encryption, and intrusion detection systems.

With voice and messaging revenues declining, CIOs must explore new monetisation models, such as network slicing and IoT connectivity solutions.

#1

MANAGING CYBERTHREATS

The expanding attack surface and increasing sophistication of cyber threats pose a significant challenge. Communication service providers have the additional pressure of addressing these threats, especially in a more connected 5G and Internet of Things (IoT) environment. To avoid data breaches, service disruptions, reputational damage, and financial losses, CIOs must prioritise cybersecurity, implementing robust authentication, encryption, and intrusion detection systems.

Solution: Implement zero-trust security models, leverage security automation tools, improve infosec literacy in the workforce, and conduct regular security assessments, penetration tests, and incident response drills.

#2

DEALING WITH DATA GROWTH

The exponential growth of data, fuelled by the IoT, 5G, and cloud adoption, is placing immense pressure on telecom networks. CSPs may face challenges in providing adequate bandwidth and ensuring the Quality of Service for their customers. It could also lead to CSPs losing out on revenue opportunities from new data-driven services. CIOs must implement robust data management strategies to ensure scalability, security, and cost efficiency.

Solution: Implement Software-Defined Networking or SDN and Network Function Virtualisation or NFV, invest in edge computing, and adopt transparent data policies. Robust privacy protection mechanisms can help maintain customer trust.

#3

SCALING NETWORK INFRASTRUCTURE

The growing demand for bandwidth and the increasing complexity of network infrastructures are already

making it challenging for CSPs to scale their networks efficiently. To be ready to handle future demands, CIOs need to find ways to add capacity without compromising performance or reliability.

Solution: Adapt cloud-native networking, leverage network automation, and invest in network slicing for scalable and cost-effective network expansion.

#4

RUNNING SUSTAINABLE OPERATIONS

The telecommunications industry is one of the significant contributors to greenhouse gas emissions. While improving operational efficiency is a constant aim, the energy-intensive industry has an additional responsibility to adopt sustainable practices too.

Solution: Explore renewable energy sources, optimise network operations, and implement energy-efficient technologies.

#5

MAINTAINING QUALITY, MONETISING ASSETS

With traditional voice and messaging revenues declining, CIOs must explore new monetisation models. This includes offering value-added services, such as network slicing and IoT connectivity solutions. CIOs play a critical role in helping their organisations develop and implement innovative monetisation strategies.

Solution: Identify and target new market opportunities, collaborate with manufacturers and other ecosystem players, and embrace data-driven personalised marketing.

#6

MEETING REGULATORY COMPLIANCE

The evolving regulatory landscape, with data privacy laws and spectrum allocation policies, poses challenges for telecom operators. To avoid penalties and reputational

The telecom industry is awash with data, and CSPs need to find ways to automate tasks, analyse data, and gain insights to streamline operations.

damage, CIOs must have the right systems and processes in place to ensure compliance.

Solution: Establish a dedicated regulatory team, implement a regulatory risk management framework, and invest in regulatory tools.

#7

HIRING SKILLED WORKFORCE

The demand for skilled telecom professionals, particularly in emerging technologies like 5G, blockchain, and Artificial Intelligence (AI), is outpacing supply. CIOs must fill these gaps to be able to continuously innovate, deploy new technologies, and provide high-quality customer service.

Solution: Focus on talent development, upskilling and cross-skilling programmes, and employee retention strategies.

#8

MEETING CUSTOMER EXPECTATIONS

Customers of nearly every industry are demanding personalised, responsive, and consistent experiences across multiple channels. Failure to meet customer expectations can lead to customer churn, negative word-of-mouth, and a loss of market share. CIOs play a key role in helping their organisations develop and implement customer-centric strategies.

Solution: Leverage omnichannel strategy, invest in customer relationship management or CRM systems, and deploy AI and Machine Learning for personalised communications.

#9

ENABLING AUTOMATION AND AI

The telecommunications industry is awash with data, and CSPs need to find ways to automate tasks, analyse data,

and gain insights to streamline operations and customer experiences. Failure to adopt automation and AI can lead to operational inefficiencies, missed opportunities, and a competitive disadvantage.

Solution: Develop an automation strategy, invest in AI, and focus on upskilling the workforce.

#10

BALANCING INNOVATION WITH COST OPTIMISATION

Telecom operators face the dual challenge of investing in innovation while maintaining profitability and agility. CIOs must strike a balance between adopting new technologies and optimising existing infrastructure to control costs.

Solution: Prioritise investments, explore cloud-based solutions, and embrace agile development.

EMBRACING THE CHALLENGES

As CIOs in the telecom and CSP sectors grapple with these challenges, it's crucial to approach them not as roadblocks but as opportunities for innovation and growth. CIOs must also adopt a proactive, forward-thinking approach, where challenges are met with resilience and creativity. By addressing these key areas, CIOs can not only navigate but also thrive in the dynamic landscape of 2024 and beyond.

Telecom CIOs in 2024 will face a multitude of challenges, requiring a blend of technical expertise, strategic thinking, and leadership acumen. By embracing technological advancements, addressing regulatory complexities, and prioritising customer experience, telecom CIOs can navigate the crossroads of connectivity and lead their organisations into a successful future. 🌟

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2016	2015	2014	2013	2012	2011
Vijay Sekhar Sharma	Rahul Sharma	Kunal Bahl	CP Gurnani	Francisco D'Souza	N Chandrasekaran

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LT GEN DR S P KOCHHAR

THE TRIPLE 'A' STRATEGY FOR SUCCESS

Affordability, accessibility and technological advancements are the critical aspects that India needs to take care of in its digital mission journey



In the rapidly evolving global digital arena, India emerges as a front-runner. This transformative journey, catalysed by the ambitious Digital India initiative, revolutionises the nation into a digitally empowered society and knowledge economy. The telecom industry, at the heart of this transformation, transcends its role as an economic entity to become a catalyst for societal and technological change. The COVID-19 pandemic demonstrated the indispensable role of telecom in lives today, from education, healthcare, and social communications, to governance, or anything else. It reinforced the sector's status as a lifeline, connecting and empowering societies during times of crisis.

The digital consumer landscape in India is witnessing a democratisation of access, with an increasing digital appetite not just in urban areas but in rural regions as well. This broad-based engagement is bridging the urban-rural digital divide and expanding the market for digital services. With one of the world's largest mobile subscriber bases and a burgeoning internet user community, India's telecom sector is ripe for the adoption of next-generation technologies like 5G, which promises not just enhanced connectivity but a potential revolution in various sectors. However, there are challenges to be met, like infrastructure development, regulatory hurdles, and ensuring accessibility and affordability.

As India stands at this digital juncture, the telecom sector is not just reflecting the nation's aspirations but

also shaping the potential for an inclusive digital future. This article aims to explore the interplay of affordability, accessibility and technological advancements in shaping India's telecom narrative and its impact on the country's digital destiny.

INDIA'S TELECOM SECTOR STATUS

With over 1.17 billion subscribers and the number of internet users surpassing 881.26 million, India's telecom industry is a cornerstone of the nation's socio-economic progress, propelled by the government's progressive push for digital initiatives, aiming to provide digital infrastructure as a utility to every citizen.

India's vast and varied geography, with its mix of urban, semi-urban and rural areas, poses unique challenges and opportunities for telecom expansion. While urban areas boast high telecom density and advanced services, basic connectivity is still being developed in some rural regions. Economically, India presents a contrast between a burgeoning middle class with an increasing digital appetite and significant sections still facing economic constraints impacting digital access.

AFFORDABILITY, ACCESSIBILITY, ADVANCEMENTS

In its report on the connected world, McKinsey categorised countries into four groups based on their rate of progress in the connectivity continuum. These groups are named 'Pioneers', 'Leaders', 'Followers' and 'Trailing Markets'. However, McKinsey assigned China and India to

“The government must explore options to make 5G infrastructure development more cost-effective, easing the financial burden on telecom operators.

In a price-sensitive market like India, where the majority of the population has limited spending capacity, making 5G services and devices affordable is crucial.



IN BRIEF

- India's telecom sector has emerged as a transformative force, connecting societies and catalysing technological change amid global competition.
- Affordability, cost-effective infrastructure, and financial inclusion are vital to propel digital inclusion and effective network development.
- Embracing 5G advancements, including spectrum technologies and IoT integration, is crucial for India's global competitiveness.
- Indigenous research, investment in education, and a robust application ecosystem is imperative for sustained leadership.
- Addressing affordability and accessibility ensures widespread benefits, fostering social inclusion and positioning India as a global tech hub.
- Collaboration between the government, industry, and stakeholders is essential to ensure equitable access to digital transformation.

distinct archetypes, acknowledging their unique status. Specifically, McKinsey described India as 'digitising faster than any trailing market'.

The nation's connectivity providers are contending with price wars, and McKinsey suggests that either price increases or government intervention may be necessary to encourage further network development. Given these unique challenges, India's approach to enhancing digital infrastructure must differ from other countries. A focused and tailored strategy is essential for a more effective digital rollout in India. Each component of this triad – affordability, accessibility, and advancement – has its own aspects, and we must look at them more holistically.

OVERCOMING AFFORDABILITY BARRIERS

Affordability is a pivotal aspect of 5G adoption in India. Consumer pricing plays a crucial role, particularly in a price-sensitive market where the majority has limited spending capacity. Ensuring the affordability of 5G services and devices becomes imperative for widespread adoption.

Cost-effective infrastructure development is another consideration. The Indian government might explore measures to make 5G infrastructure development more economical. This approach would alleviate the financial burden on telecom operators, potentially leading to lower service costs for consumers.

Additionally, fostering financial inclusion is essential. This involves creating financial products and services tailored for low-income groups, enabling them to afford digital services and devices. This strategy contributes to broader digital inclusion, aligning with India's vision for widespread technological accessibility.

FORMULATING ACCESSIBILITY STRATEGIES

Bridging the urban-rural digital gap is a pressing need, making the deployment of 5G in rural areas dependent on innovative infrastructure solutions and government support. Ensuring digital equity requires a focus on digital inclusion for all society segments, particularly marginalised communities.

To enhance the appeal and utility of digital services in rural and semi-urban areas, the development of localised

Efficient and strategic use of spectrum, like the allocation of the potent 6 GHz band for 5G services is important to ensure optimal use of this limited resource.

content and services in regional languages is crucial. Strengthening Public-Private Partnerships (PPPs) is vital for the development of telecom infrastructure in hard-to-reach areas and there is a need to leverage the strengths of both sectors to achieve greater reach and impact.

ADVANCING TECHNOLOGICAL FRONTIERS

To stay globally competitive, India must embrace the latest 5G advancements. This includes adopting new spectrum technologies, Edge computing and IoT integration. There is also the need to support engineering technologies by recognising that 5G's role in driving AI, AR/VR, and smart cities is crucial for India's digital evolution.

Further, encouraging indigenous 5G research and development is vital to reduce reliance on foreign technology and tailor solutions to local needs, while investing in education and training programmes is essential to cultivate a skilled workforce capable of supporting these advanced telecom technologies.

An important initial lesson from 5G implementation is the significance of developing applications tailored to market requirements alongside standards and network technologies. As India looks toward a leadership role in 6G, the young and creative workforce must ideate and develop applications which help propel the uptake and use of these technologies efficiently and optimally. There is also a need for the government to foster a robust ecosystem for application development, much like the recently committed 100 5G labs announced for the development of use cases.

IMPACTING INDIA'S DIGITAL MISSION

Affordable and accessible 5G technology can revolutionise various sectors, including healthcare, education, agriculture and manufacturing, aligning with the goals of Digital India and Industry 4.0. Widespread 5G adoption can significantly contribute to India's economic growth, creating new job opportunities and fostering innovation across industries.

By addressing affordability and accessibility, India can ensure that the benefits of digital transformation are equitably distributed, contributing to social inclusion and national development. Besides, advancements in 5G technology can stimulate an ecosystem of innovation,

attracting global investments and positioning India as a hub for technological innovation.

CHALLENGES AND FUTURE OUTLOOK

While the potential impact is immense, India grapples with multifaceted challenges in its digital transformation journey, encompassing infrastructure limitations, regulatory complexities, and the imperative of ensuring technology's inclusive reach. Addressing these challenges necessitates a concerted effort from the government, industry, and various stakeholders.

Infrastructure scaling: The primary challenge revolves around scaling infrastructure, particularly in rural and remote areas, to facilitate the robust support needed for high-speed internet and the extensive reach of 5G networks.

Regulatory framework: Streamlining the regulatory framework becomes imperative for expeditious technology deployment. This includes supporting the swift implementation of new technologies, ensuring data privacy and security, and effective enforcement of progressive government measures such as right-of-way rules.

Spectrum allocation: The judicious and strategic allocation of spectrum, especially the potent 6 GHz band for 5G services, is crucial. This aims to optimise the use of this limited resource, striking a balance that meets the diverse needs of various stakeholders in the technological landscape.

India's telecommunications sector plays a crucial role in realising the nation's digital ambitions. Balancing the three aspects of affordability, accessibility and technological advancements, will not only drive the sector's growth but also significantly contribute to India's socio-economic development, ensuring that the benefits of digital transformation are accessible to all segments of the population. Collaborative efforts from the government, private sector and civil society are essential to overcome the challenges and harness the full potential of digital technologies for national progress and prosperity. 🌐

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The next frontier for telcos in India

Satellite internet services, expected to commence operations in 2024, is a big opportunity for both telcos in India and the global firms



BY VERNIKA AWAL

On 27 October, Akash Ambani, the Chairman of Reliance Jio Infocomm, the tech and telecom division under Reliance Industries, announced the launch of JioSpaceFiber. Taking the stage on the same day at the 2023 India Mobile Congress, Sunil Bharti Mittal, Chairman of Airtel's parent firm Bharti Enterprises, announced that OneWeb and Airtel's satellite internet services were ready to commence operating in India in November itself.

While neither has started services in the country yet, the announcements stand testament to the approach that the two major telecom operators have taken by signalling satellite-based network services as the next big frontier for the robust telecom industry in India.

But it is not just Jio and Airtel that are vying for a slice of this nascent, yet-to-launch subset of the networking and telecommunications sector in the country – Elon Musk-backed satellite internet services firm, Starlink, has also procured a licence from the Department of Telecommunications in India to offer its services here.

Jeff Bezos and Amazon-backed Project Kuiper, which is a step behind the rest in terms of launching its satellites, has also made a beeline to launch similar services in the country.

All of this makes the satellite internet industry a hotly contested one to follow, even before services have commenced. While the regulatory hurdle of spectrum allocation is the key bottleneck that all companies are waiting to get resolved, bets made by major domestic and global corporations show that the satellite communications, or satcom industry of India, is likely to be the next big frontier for telcos to take on.

WHAT MAKES SATCOM SO HOT?

Simply put, most networks used by consumers as well as enterprises today are based on terrestrial infrastructure. In simpler words, all wireless network communications take place through cell towers and networks that are based on Earth itself. satcom, as the name suggests, takes the aerial route, with satellites orbiting the earth and deployed by the companies in question planning to



IN BRIEF

- Jio and Airtel announce satellite internet services, joined by Starlink and Project Kuiper, marking a significant shift in India's telecom industry.
- Regulatory hurdles linger as all await spectrum allocation resolution, highlighting the growing importance of satcom.
- High initial setup costs pose challenges, but lower satellite launch costs and increasing demand for high-speed connectivity present vast opportunities.
- Starlink and Kuiper's entry does not jeopardise Jio and Airtel's plans; the market is large enough for multiple players, ensuring sufficient capacity.
- With regulatory hurdles being addressed, the satcom services industry is poised to commence operations, offering new opportunities for telcos in India.

beam down network bandwidth to be used for a wide range of tasks.

These tasks will range from consumer-end connectivity through satellite networks, as well as to connecting enterprises in remote locations, such as aboard vessels in maritime activities, remote offshore oil rigs, or across difficult mountain terrains, where setting up network towers and sites and laying down fibre is incredibly difficult.

To be sure, satcom is not an entirely new sector. However, the liberalisation of India's space operations, combined with the rollout of the New Space Policy 2023 earlier this year, has provided a much-needed impetus for private firms to access satellite bandwidth, a feature that was so far tightly under government regulations.

Satcom services, to simplify matters, are significant because they open up a whole new avenue for telecom operators to tap into. By using satellite bandwidth, these operators can reach new markets that are as yet not connected, or see very limited services to date. A wide range of use cases, such as lower latency and higher bandwidth connectivity, will open up thanks to progress in satellite technologies. This, in turn, has made satcom into a lucrative avenue that telcos and global firms alike are waiting to tap.

THE MARKET OPPORTUNITY

Responding to Voice&Data's query, TV Ramachandran, President of the industry body Broadband India Forum (BIF), said that satcom services offer "a huge pent-up demand and large consumer market potential" even in the near term. Data from information services platform ICRA, cited by BIF, said that as of 2021, while the US had 2.1 million active consumer-end satellite connections and 2.6 million enterprise satellite connections, India had no consumer services and only 3,00,000 enterprise connections.

This meant that India's satcom market, as of 2021, was just around 6% the size of the US satcom market overall, despite India's exponentially larger population potentially offering a bigger market waiting to be tapped into.

"Satellite communication has a great role to play in serving the unserved and the underserved regions of the country. These are those areas which are difficult to serve and not techno-economically viable through terrestrial technologies. Satellite communications will always provide a complementary service and

Satellite communications will always provide a complementary service and not a competitive service to terrestrial technologies with dependable redundancy.

not a competitive service to terrestrial technologies with dependable redundancy, even in urban areas for disaster recovery and provision of emergency services,” Ramachandran said.

Lt Gen (retd) Anil Kumar Bhatt, Director General of the space industry body Indian Space Association (ISpA), concurred. “A recent ISpA-Nasscom-Deloitte report pegged the market potential for satcom in providing broadband connectivity to remote areas to be approximately USD 263 million in the next five years. This underscores not only the technological advancement but also the substantial economic opportunities associated with addressing connectivity challenges in India’s rural landscape,” Bhatt said.

Ramachandran also added that a large section of India’s 1.4 billion population is yet to connect to broadband networks. This offers a sizeable market opportunity for all stakeholders looking to capture a share of the overall pie.

“The total broadband subscriptions as per the latest TRAI subscriber data is around 880 million users. It must be understood that many consumers, especially in urban areas, have more than one broadband subscription. Hence, the actual number of unique broadband subscribers is estimated to be around 600 million. In a country with a population of 1.4 billion, this indicates a sizeable addressable market,” he said.

Sectors that will present major opportunities, Ramachandran said, include agriculture, remote healthcare and e-commerce, among others.

MITIGATING COSTS WITH VOLUME

While all of this is good, it is also important to note that the setting up cost of satcom infrastructure will be significantly high. Data shared with Voice&Data by BIF indicates that while the cost of setting up satellite ground stations in urban circles, due to the scale of users and high density per square kilometre, could be comparable with terrestrial networks, this goes to become as high as 18 times as that of traditional fibre-based networks in rural and remote areas.

Eventually, experts believe that capturing the largest possible user volume is what will drive the

market forward, hence explaining the rush to launch services by Jio, Airtel, Starlink, and Kuiper alike. The initial cost of satellite internet services, however, will be undeniably high.

Nevertheless, there are silver linings for the service providers to consider. According to Bhatt, lower satellite launch costs would be a key factor in making satcom services less exorbitant or prohibitive in terms of operational expenditures for telcos.

“This holds the potential to facilitate the widespread establishment and maintenance of satellite constellations, subsequently driving down the overall expense of satellite internet services for consumers. Simultaneously, the escalating demand for high-speed connectivity, fuelled by the increasing prevalence of bandwidth-intensive activities like video streaming and gaming, underscores the critical role that satellite internet can play. Even in regions with limited terrestrial infrastructure, satellite internet stands poised to meet the demand for swift and reliable internet access,” he said.

ROOM FOR ALL PLAYERS

Both Ramachandran and Bhatt believe that the likes of Starlink and Kuiper will not jeopardise the plans that homegrown telcos Jio and Airtel have. “The overall pie is big enough for several foreign and local players to operate. The New Space Policy 2023 permits equal opportunities for both foreign and indigenous players and the operation of open market forces. This is likely to enable free and fair competition among all the players, thereby reducing the artificial supply crunch in the sector and enabling sufficient capacity,” Ramachandran added.

Bhatt added that Jio and Airtel’s superior understanding of local market dynamics could help them further, thus not signalling doom once the sector becomes operational, and foreign players enter the fray, too.

As a result of all these factors, the satcom services industry looks set to commence operations, thereby presenting a marquee new opportunity to tap new users and see a surge in growth that became stagnant in the conventional telecom space. 🌟

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Nokia, Telia Finland partner for 5G Core SaaS initiative

Nokia has announced that Telia Finland has chosen its 5G Standalone Core Software as a Service (SaaS) as part of an EU-funded innovation initiative. This strategic move is geared toward empowering Telia Finland with a fully automated and scalable software model. The objective is to enhance business agility and expedite the delivery and monetisation of 5G network services.

Telia Finland, collaborating closely with Nokia, plans to pioneer a 5G Standalone Core stack, becoming the first Finnish operator to open its network to application developers, particularly for industries like transportation. EU funding will support the creation of 5G Standalone corridors along highways and seaways in the Sirius innovation programme.

The two companies signed a memorandum of understanding, integrating Sirius with Nokia's Network as a Code platform. This, along with a developer portal, will facilitate the creation of software applications for diverse use cases. The collaboration explores innovative monetisation models in a SaaS framework, beyond traditional connectivity.



Nokia's Core SaaS shifts away from traditional practices, guiding operators and enterprises from deploying customised software on private infrastructure. The subscription-based model eliminates upfront capital expenditure and on-site software maintenance.

To further support the Sirius innovation programme, Nokia's platform equips application developers with essential tools like Software Development Kits and Network Application Programming Interfaces or APIs. These tools provide access to Telia's network functionality, enabling developers to create new use cases and capabilities for their customers.

1&1 Launches Europe's first fully virtualised 5G network

German mobile network provider 1&1 has launched Europe's inaugural fully virtualised 5G network, utilising cutting-edge Open RAN technology. Having introduced Fixed Wireless Access (FWA) in December 2022, the network now extends its services to encompass mobile services (eMBB), making 1&1 O-RAN operational nationwide in Germany. To ensure seamless coverage, the network employs national roaming on the Telefónica network, with plans to integrate the Vodafone network in the summer of 2024.

The cloud-native 1&1 O-RAN boasts efficient network control through the integration of leading software and platforms from technology partners Rakuten and Mavenir. Rakuten Symphony manages the end-to-end integration of the network while Mavenir provides the cloud-native core network software. Open-RAN technology revolutionises traditional mobile networks by distinctly separating software and hardware, with software-based antennas

operating in a private cloud on commercial servers across decentralised edge data centres.

The approach allows 1&1 to collaborate with over 80 companies. The private cloud houses all network functions, controlled by software primarily from Rakuten and Mavenir. As the first European provider of a commercial Open Radio Access Network, the initiative signifies a new era in mobile networking for 1&1. Rakuten, with its extensive experience in operating the world's first Open RAN in Japan, serves as an end-to-end technology partner, ensuring seamless interaction among components.

Mavenir contributes essential components to the core network, running as container-based microservices on Rakuten Symphony's platform, catering to both fixed wireless access and mobile services in the 1&1 O-RAN. This milestone marks a significant leap in the evolution of 5G technology in Europe.

NXP unveils integrated UWB family for automotive applications



NXP Semiconductors has introduced a fully integrated automotive single-chip Ultra-Wideband (UWB) family. The technology combines next-gen secure and precise real-time localisation with short-range radar to address various use cases with a single system, including secure car access, child presence detection, intrusion alert, and gesture recognition. Integrated by major automotive OEMs, devices from this family are anticipated to be on the road in model year 2025 vehicles.

The new UWB family includes the highly integrated NCJ29D6B and pin-to-pin compatible NCJ29D6A, the industry's first automotive device combining ranging and short-range UWB radar into a single chip with an integrated MCU. This integration allows OEMs to transform a UWB-based car access system into a flexible, multi-purpose platform, streamlining development and reducing cost, space, and weight. For example, OEMs can leverage their secure car access system for features like child presence detection. This approach helps minimise redundant systems, reduce total cost of ownership, and accelerate time to market for new features.

The NCJ29D6B enhances secure car access, offering hands-free access through a digital key on a UWB-enabled mobile phone. It features improved RF sensitivity, simultaneous operating receiver chains for antenna diversity, and increased CPU performance. The NCJ29D6A extends these features with short-range UWB radar, enabling in-cabin sensing and various smart gesture recognitions, maximising the value of UWB capabilities in automotive applications.

Designed with cybersecurity in mind, NXP's UWB family exceeds ISO21434 Cyber Security Requirements. The devices also support standard-compatible UWB ranging protocols, simplifying AUTOSAR architectures. The integration of security capabilities anticipates the increasing variety of physical and cyber threats to vehicles.

Orange Business and VMware collaborate for flexible SD-WAN



Orange Business has joined forces with VMware to introduce Flexible SD-WAN, making VMware the inaugural fully embedded SD-WAN offering in the Evolution Platform. This platform seamlessly integrates a secure digital infrastructure with an agile, cloud-oriented approach for ordering and managing services, empowering enterprise customers to tailor their mix of services.

Enterprises gain access to a product catalogue, including Flexible SD-WAN with VMware, through a self-service console or API on the Evolution Platform. Automation and service chaining simplify the management of the customer's entire digital infrastructure, ensuring secure user-to-cloud and cloud-to-cloud connectivity, along with voice services. The platform also provides end-to-end visibility and service guarantees.

Flexible SD-WAN with VMware addresses the requirements of highly distributed, latency-sensitive workloads, applications, and devices at the edge. With advanced automation capabilities, it optimises the user experience for remote applications, enhancing employee productivity. The solution allows for swift site deployment using various connectivity options like 5G, LTE, Wi-Fi, or satellite, with auto-provisioned edge devices, reducing IT costs and deployment times.

VMware's SD-WAN offering offers customers choice and interoperability, enabling them to build an ideal network for their business. As part of VMware's software-defined edge portfolio, SD-WAN contributes to modernising digital infrastructure and enhancing security, reliability, and scalability for organisations of all sizes and industries. Customers using Flexible SD-WAN with VMware via Evolution Platform also benefit from a global network of Super Points of Presence strategically located on the Orange Tier 1 global backbone.

Ericsson to support AT&T's Open RAN deployment

Ericsson will deploy a range of 5G Open Radio Access Networks (O-RAN) products for AT&T's nationwide initiatives in the US. The collaboration aims to build a 5G network platform for AT&T utilising cloud-native technologies based on O-RAN standardised interfaces, focusing on scale, cost efficiency, sustainability, and high performance. The companies plan to transform this into a cloud-native open network over time.

The deployment will leverage Ericsson's 5G Smart Factory in Texas for related infrastructure production, complying with Build America, Buy America laws. Ericsson's sustainability-centred technology offerings align with its R&D investment strategy, emphasising resilient, open, sustainable, and intelligent future networks.

The intelligent and programmable capabilities will facilitate innovation such as rApps, automation, and network APIs, unlocking the full potential of 5G for new monetisation opportunities. Ericsson's open architecture provides a platform for developers to drive innovation and business cases.

The strategic agreement focuses on creating an open programmable network, allowing AT&T to accelerate the introduction of Open RAN equipment and network



management solutions from multiple vendors. Ericsson's solutions include the latest Massive MIMO and remote radios, next-generation RAN Compute, and Cloud RAN solutions, transitioning to Open RAN architecture with open interfaces and disaggregation. The deployment also involves Ericsson's Intelligent Automation Platform, providing multi-vendor, multi-technology service management and automation for AT&T's network. Ericsson will utilise its leading position in Open RAN standardisation to support O-RAN Alliance SMO interfaces within the AT&T network.

Vertiv acquires CoolTera for advanced liquid cooling technology

Vertiv, a provider of critical digital infrastructure and continuity solutions, has finalised an agreement to acquire CoolTera and its assets. The UK-based company specialises in liquid cooling infrastructure, manufacturing coolant distribution units (CDU), secondary fluid networks (SFN), and manifolds for data centre liquid cooling solutions. The acquisition enhances Vertiv's thermal management portfolio, adding advanced cooling technology, domain expertise, and industry partnerships.

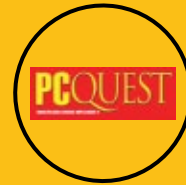
CoolTera and Vertiv have been technology partners for three years, collaborating on global deployments in data centres and supercomputing systems. The acquisition includes shares, contracts, patents, trademarks, and intellectual property from CoolTera's affiliate. The move reinforces Vertiv's position in high-density cooling

solutions and strengthens its capabilities to support large-scale AI applications.

Giordano Albertazzi, CEO of Vertiv, emphasised the strategic value of the acquisition, stating that it aligns with their vision for long-term value creation. While the purchase price is not deemed material, the addition of CoolTera's technology is crucial to expanding Vertiv's liquid cooling portfolio.

Mark Luxford, Managing Director of CoolTera, expressed enthusiasm about joining the Vertiv family, recognising it as a leader in data centre thermal management. Luxford highlighted Vertiv's ability to scale technologies rapidly, a vital aspect of AI deployment. The collaboration aims to deliver next-generation liquid cooling technologies at the scale demanded by the industry, positioning Vertiv to support the growth of the sector.

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TECH TRENDS

24 TRENDS SHAPING 2024



Voice&Data explores essential technologies and developments set to reshape the world in the coming year

BY VERNIKA AWAL

The year 2024 is upon us, and as 2023 draws to a close, there is plenty to ponder in terms of what has come our way this year in the technology and telecom sectors and what we have missed out on. One thing that most industry experts agree upon is that the upcoming year should be one of India's biggest years in tech. For instance, Anku Jain, Managing Director, Mediatek India, believes that India will "make its indelible mark on the global 6G ecosystem... bolstering networking, connectivity and communication (in) businesses."

Not to forget, though, are conversations around the entire artificial intelligence (AI) industry. Anil Chawla, Managing Director of Customer Engagement Solutions, Verint India anticipates that AI-driven personalisation and advanced analytics will play a pivotal role in

redefining customer experiences. "These technologies will empower businesses to anticipate customer needs, deliver hyper-personalised interactions, and create immersive, seamless experiences across channels," he says

AI, in no uncertain terms, was the biggest conversation driver across the industry through 2023 and it is expected to remain so next year as well. Going ahead in 2024, it is expected to become more ubiquitous, all-encompassing, affordable, proliferated, and perhaps even more controversial. These controversies could arise in the way AI gets regulated globally, as well as in how companies and engineers manage to tackle biases in AI algorithms.

Stakeholders of the global tech ecosystem, meanwhile, see several other areas that could define key

In 2024, satellite-based Internet services are set to connect remote areas, while also improving connectivity in mainstream circles.

trends in technology next year. Biju Thomas, Competency Head of Device Engineering, Tata Elxsi noted that beyond AI and 5G, Virtual and Augmented Realities (AR/VR) will play a pivotal role in tech trends in the coming year. He also added that while data will be the key currency for the entire global tech market, addressing cyber security concerns will play a major role across sectors through next year.

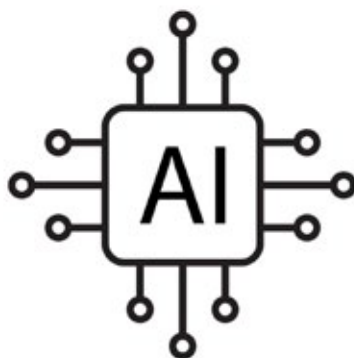
Prakash Balasubramanian, Executive VP of Engineering Solutions, Ascendion points out that beyond 5G and AI, the year ahead can expect to benefit from metaverse experiences, Edge computing, Quantum computing and networks, and blockchain, among others.

Voice&Data takes a look at 24 pivotal technology trends that will have the highest impact on the world, next year. While some may eventually not play out, the following gives a fairly robust take across all industries and geographies in terms of the kind of solutions one can expect largely everywhere.

MATURITY OF GENERATIVE AI

Generative AI will no longer be just a buzzword. Next year, generative AI will start showing the first signs of maturity—the tendencies of which can already be seen this year itself. For instance, data centre demand is on the rise, new AI models with better outcome potentials are being unveiled, and the industry as a whole is talking about all the opportunities in hand for actual business use cases. India's \$245-billion IT services sector, which includes behemoths such as Tata Consultancy Services and Infosys, has bet heavily on the maturity of generative AI, while global technology leaders have said that while the hype is likely to start

Increasing the accessibility of quantum power on the cloud will also enable developers to find real-world use cases for quantum computing.



slowing down, that is so because multi-million-dollar tech projects are likely to surface in this field of AI next year.

02 AFFORDABLE AI ACCESS FOR ALL

One of the reasons why generative AI has seen limited adoption so far is because the fundamental infrastructure behind the technology is expensive—making scaled deployments difficult so far. However, as scale begins to build, access to not just generative AI, but overall sophisticated AI technologies, will become more affordable. Overall, 2024 is the year when tech providers will look to rationalise the cost of AI services, while clients across industries will look to integrate AI in every field—operational infrastructure, cyber security, content and ancillary operations, and more. Mass-scale adoption is likely to go mainstream in nearly every industry next year, thereby making 2024 the year when AI became affordable—not just for large businesses, but for the smaller ones too.

03 UBIQUITOUS 5G IN INDIA

While 5G services were officially rolled out in India in October 2022, within less than 14 months, the nation is expected to have more than 130 million 5G users as per the 2023 edition of the Ericsson Mobility Report. This growth has come with a steep upward curve, but this is not all. Come 2024, 5G is expected to become ubiquitous for both consumers and enterprises. At the recently hosted India Mobile Congress in October this year, technology providers showcased multiple 5G solutions for industrial and home use cases, signing multiple deals with telecom operators that seek to further expand their 5G coverage. Sunil Bharti Mittal, chairman of Airtel's holding firm

Bharti Enterprises, said at the event that the telco will cover all of India with 5G services by March 2024. Going forward, it is clear that 5G will be everywhere next year.

UPSWING IN SATELLITE SERVICES

Beyond 5G, both Jio and Airtel put their next bets on the satellite frontier. While Jio chairman Akash Ambani announced the launch of JioSpaceFiber at IMC in October, Airtel's Mittal said that the operator's satellite-based communications services were to be launched by last month. While all of this is obstructed by the exigency that is the allocation or auctioning of satellite spectrum, 2024 is the year when this entire space is expected to open up. Space is already the next frontier, and next year, satellite-based Internet services are set to connect remote areas, while also improving connectivity in mainstream circles. Aviation Internet should become accessible in domestic travel, too.

REAL-WORLD QUANTUM APPLICATION

While generative AI essentially hogged all the attention in 2023, the next year is set to be significantly diverse. A large chunk of this will be contributed by quantum computing. Announced as a Rs 6,000 crore national mission by the Centre earlier this year, work on quantum computing is progressing at a steady pace—backed by central government agencies such as the Centre for Development of Advanced Computing, as well as the Office of the Principal Scientific Advisor. Industry experts have said that quantum communications is key to national security going forward, and pilot programmes that were begun in 2023 will start seeing real-world trials and implementations next year. Increasing the accessibility

04

An increasing number of common services will switch over to the use of passkeys, such as on-device biometrics and network-based authentication.

06

AI-DRIVEN CYBERTHREAT, SOLUTIONS

Cyber security will have a tumultuous year in 2024 as well, as it has been happening every year for the past half a decade. But next year, the cyber war will be played out more by AI, than by humans. Case in point—the advent of generative AI has further lowered the bar for an increasing volume of convincing cyber threats, such as spear phishing or audio impersonation of voices. While all of these have severe implications, cyber security experts believe that generative AI can also be used as a weapon to take on the very threats that use AI to be developed. As a result, it will be interesting to see how cybersecurity experts use AI to tackle newer, more sophisticated threats that may also become mainstream.

05

07

PASSWORD-FREE CONSUMER SERVICES

While the AI tussle in cyber security is a unique battlefield in itself, the other innovation that is likely to become commonplace is a change to how we log in to most of our systems. Over the past five years, multiple cross-industry efforts, such as the FIDO Alliance, have been seeking to remove passwords in favour of more secure login mechanisms. An increasing number of common services are steadily switching over to the use of passkeys, such as on-device biometrics, network-based authentication and other procedures, as login methods—instead of passwords. In 2024, more mainstream services are set to let go of password-based logins, and choose alternate methods instead.



08 REVIVAL OF GLOBAL TECH SPENDING

While AI, 5G and cyber security are imperative technologies that will form the core parts of multiple industries, non-core tech spending is also likely to see an uptick in the coming year. This will be crucial since global tech spending is what drives India's mammoth IT services sector. 2023 was a slowdown year for the sector, thus having an impact on its contribution to the overall domestic growth of the country. Most industry stakeholders, as well as brokerage firms, expect 2024 to be the year when tech spending revives after a muted year that saw India's top IT firms slash revenue growth. However, this revival will be driven by a ramp-up of core tech projects—inflationary concerns, as well as uncertainties driven by geopolitical conditions are likely to restrict broad-based risk-taking from US and European companies.

09 EXPANSION OF MULTILINGUAL DATA

Businesses, however, will continue to become more and more about the data they hold. Come 2024, pretty much every business will become data parameters of multiple types. Going forward, business intelligence platforms will leverage the advent of mainstream generative AI to drive an increasing volume of structured data in every geography and sector. What this will do is generate data that can be read, analysed and assessed by algorithms not just in English, but in multiple non-English languages that include several Indic languages too. This will be a clear theme that will emerge next year and will be one to watch. Even the government is working on it—the Centre's India Datasets Platform, announced earlier this year by Union Minister of State for IT, Rajeev

08

Expect autonomous technologies to start coming to mainstream car brands, instead of just being limited to luxury brands or super-niche vehicles.

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10

10 SHIFT IN THE 5G SMARTPHONE MARKET

For consumers, 5G will be the single biggest factor to upgrade their gadgets in 2024—specifically, smartphones. Going forward, the market share of smartphones that support 5G will change drastically, as more brands have begun bringing 5G smartphones to the budget segments priced at around Rs 10,000. Any smartphone that is more expensive than this already comes with 5G support pretty much by default today. While IDC pegged the share of 5G smartphones in the September quarter's shipments to India to be at 58%, by next year, the proliferation of 5G in the budget segment will significantly increase this—thus making 2024 the year when 5G smartphones go potentially mainstream.

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11 PROLIFERATION OF AUTONOMOUS TECH

While it is understandably too early to say autonomous driving will go mainstream, 2024 is the year when semi-autonomous vehicles start becoming mainstream. Many mainstream cars in India last year saw technologies such as 360-degree cameras, remote connectivity, lane warnings, adaptive braking and hands-free parking. While these technologies are what constitute basic semi-autonomous driving technologies, the proliferation of these advanced technologies into the mainstream fold means that auto companies are becoming increasingly reliant on technologies to power their cars—and 2024 is likely to see much more of it. Expect advanced technologies to start coming to mainstream car brands as well, instead of just being limited to luxury brands or super-niche vehicles.

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5G BOOST FOR INDUSTRIAL IOT

Automation in heavy machinery is not a new thing. However, going forward, the fourth industrial revolution will get a leg up thanks to 5G and its core competencies. The latter brings low latency connectivity to factory floors, assembly lines and other industrial setups, which in turn means that companies will be able to run a fully smart factory with an increasing amount of data output and fewer time gaps between when an incident happens on a factory floor, and when it is recorded by sensors. Enterprise 5G networks will be a clear theme for 2024, wherein such networks shall be set up by more industrial firms. In turn, these will create large economic opportunities to enable factory floor workers to switch to better, remote locations—and work in better conditions.

5G will drive the fourth industrial revolution, enhancing automation, enabling smart factories, and creating new economic opportunities.

has been coming along for multiple years, 2023 is the year when the industry saw multiple startups go public. Several drone adoption schemes also saw the completion of pilot projects, while many other government-backed schemes were introduced across agriculture and civil services domains. Going forward, 2024 is the year when such adoptions are likely to scale up after 2023 showcased that drone adoption and drone services in India can indeed be scaled—and it is no longer a small-scale sector. The coming year is when local drone manufacturing and development may also attract increasing component localisation, thereby adding more revenue to India itself.

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RISE OF NO-CODE PLATFORMS

No-code application development is one field that has seen a strong surge of growth driven by generative AI. The latter, which helps generate code by using simple instructions written in plain text, is transformative. While natural language processing (NLP), a subset of AI, was already adding plenty of capabilities to startups creating no-code development platforms, generative AI is what will lend scale to no-code service providers. It will also rope in more clients, who will begin experimenting with the kind of application development that may in the long run democratise the entire realm of developer activities. For coders, no-code platforms expedite code writing and make the overall process very simple.

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BOOM TIME FOR ESIM ADOPTION

A large part of the growth in industrial tech adoption, as well as the advent of connected and autonomous cars, will see a steadily increasing need for eSIMs across all sorts of devices. eSIMs are essentially the virtual counterparts of a physical SIM card and are imperative for anything to connect to a network wirelessly. Having eSIMs embedded into networking hardware will be the obvious way forward as both consumer and enterprise technologies become increasingly connected. In the long run, eSIMs will turn into one of the biggest growing segments driven by the demand for connectivity. In India too, this will be the obvious way forward—as connected hardware continues to grow.



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UPTICK IN PROMPT ENGINEERING JOBS

To support the trend above, however, there will be a new segment of niche software engineers—who are already rising the trend ladder in 2023 itself. Called 'prompt engineers', these are software experts who understand

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INDUSTRIAL USE CASES FOR DRONES

While the development of drones

how an LLM works, and subsequently use strategic text prompts to get diverse and accurate results. Prompt engineers often have by far the best industry expertise in generative AI, as well as a deep understanding of how specific algorithms work—and can therefore make the most of AI tools and applications to get the right generative AI results. Going forward, many firms are likely to experiment with prompt engineers, to get their own AI journeys going.



dedicated tech regulations catering to respective countries. In such times, for any business operating globally, it may become a significant operating expense to individually comply with every nation's needs. As a result, data localisation will become common for most businesses next year, instead of upcoming regulations and the general course that the World Wide Web has taken.

SURGE IN SMB CLOUD ADOPTION

Cloud adoption is no longer a recent trend—over time, and especially accelerated through the pandemic, cloud adoption became common for all enterprises across the country. By now, even mid-sized private businesses in the country have, in some ways, experimented with migrating their business operations online. Larger companies, on this note, have moved their operations to multi-cloud platforms—in a bid to optimise costs and avoid downtime. Come 2024, small businesses are also expected to join the cloud bandwagon, as cloud services become imperative to the operating infrastructure of most industries. From financial services to machinery, engineering and retail, cloud adoption's scalability will make it affordable enough to be adopted by all small businesses in India next year.

GROWTH IN DATA LOCALISATION

Even though the Digital Personal Data Protection (DPDP) Act did not mandate it, data localisation will continue to become more commonplace—not just in the Indian context, but also beyond it. Most firms that operate globally will be cognisant that an increasing number of nations are in the process of framing, or have already introduced

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Having eSIMs embedded into networking hardware will gain currency as both consumer and enterprise technologies become increasingly connected.

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JUMP IN TECH FOR SUSTAINABILITY

Through all of these developments, one key theme that has risen to the forefront is sustainability. No longer a corporate afterthought, sustainability and the need to develop solutions for sustainable tech deployment have risen as a top business avenue around the world. In 2024, global regulations on climate change will enforce stricter rules on emissions and the impact on the operations of various industries. To keep up with this, technology will be the obvious way forward for industries to find solutions—such as using AI to optimise supply chain sourcing norms for commodities for a manufacturing company. Then, there are the technologies themselves, where sustainable solutions will be the key to making them efficient. All of this will happen next year.

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INTEGRATION OF AI IN THE SUPPLY CHAIN

Right on cue to improve sustainability practices, a key part will be to make supply chain practices more efficient. To do that, a key factor will be in the use of AI. For instance, global product shipping is a clear practice that adds to emissions and is not the most efficient around the world. To improve this, AI can play a major role in reducing emissions during transit, making manufacturing and component sourcing itself more efficient, and finding the fastest ways

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to create a particular product thanks to a globally distributed supply chain. All of this will become possible due to AI, and in 2024, this will become an industry-standard practice. The foundation stones, such as German enterprise technology firm SAP's rollout of AI into its products in November this year, have already been laid this year.

NEW GEOGRAPHIES FOR CHIP DEVELOPMENT

Chipmaking as an industry was so far largely concentrated in the US in terms of IP ownership and Taiwan in terms of chip manufacturing. However geopolitical concerns and conflicts have led companies as well as nations to make concerted efforts to diversify supply chains of chips. India has been a significant playmaker on this note, welcoming its first chip facility that was announced earlier this year by Micron. Going forward, chip development will expedite through 2024, with devices such as industrial appliances and networking hardware being key devices that will require indigenous chips to reduce dependence on other nations.

AI INFLUENCERS IN CREATOR ECONOMY

While rather far away from the trends above, AI influencers are already on the rise and going forward, the national marketing industry will continue to see larger and larger dollops of AI. From virtual influencers themselves that have added novelty to a crowded influencer market, to the proliferation of AI in the content that influencers make for themselves, AI will be at the centrepiece of this entire conversation. The proliferation of increasing intelligence will also lead to the creation of an alternate creator economy in the coming year, which will exist alongside human influencers with an already

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2024 could be the year when the first generation of truly immersive metaverse experiences are built.

22



23

UBIQUITOUS WORKFORCE UPSKILLING

The one common factor across all nations in 2024 will be workforce upskilling and include the involvement of AI or digital skills in various ways. Through these new technology subsets, workforce upskilling will offer both white-collar and blue-collar workers new skills to keep up with the requirements of a new world order where technology is involved in nearly every process of every industry. As a result, hourly-wage warehouse workers may soon become book-keeping supervisors, with machines largely replacing the manual brunt work. All of this will require individuals to continue to upskill themselves, and 2024 could be the year when more people take this seriously.

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REVIVAL OF IMMERSIVE METAVERSE

While metaverse has admittedly had a flat year, after being one of the biggest buzzwords of 2022, the next year could be where metaverse interest starts renewing in slightly advanced forms. Most brands have seen that a flat, 2D view of metaverse experiences is not entirely immersive in the true sense—it is because of this that the launch of the Apple Vision Pro headset was seen to be pivotal in the industry. As a result, 2024 could be the year when the first generation of truly immersive metaverse experiences are built and experimented with in terms of what value additions could do. Reviving tech spending across industries could be a major contributing factor to this. 🍀

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PUSHING TECH EVOLUTION BEYOND LIMITS

Technological tipping points: Transformative trends set to define communication, connectivity, and digital infrastructure in 2024



BY PRABHU RAM



As we stand at the cusp of 2024, several key technological advancements are poised to significantly impact the world around us. From the evolution of 5G to the rise of edge computing and the continuous integration of artificial intelligence, several key trends are set to redefine how we connect, communicate, and build the digital backbone of tomorrow.

#1 REVOLUTIONISING COMMUNICATION, NETWORKS

Artificial intelligence (AI) and machine learning (ML) are orchestrating a revolution in communication. With seamless natural language processing (NLP), real-time translation, and personalised communication experiences, AI-powered chatbots are evolving into sophisticated customer support tools.

ML algorithms, analysing communication patterns, will foster effective cross-cultural collaboration. The democratisation of Generative AI (GenAI) will make these models accessible worldwide, significantly impacting enterprise knowledge and skills. In 2024, the first wave of multi-modal GenAI is expected to deliver immersive multisensory experiences, spanning text, audio, video, and music.

Going ahead, AI will become deeply ingrained in our digital infrastructure, influencing how we process and leverage data for improved decision-making and automation. AI-driven enhancements in communication platforms will redefine user experiences. Natural language processing (NLP) algorithms will enable more sophisticated chatbots and virtual assistants, making interactions more intuitive and context-aware. AI will also play a pivotal role in optimising network performance,



IN BRIEF

- AI and ML will redefine communication with NLP, real-time translation, and personalised chatbots. GenAI will bring multisensory experiences in 2024.
- 5G will unleash ultra-fast data transfer, massive capacity, and IoT proliferation. Global expansion enhances user experiences and fuels innovations.
- Edge computing will reduce latency, enabling seamless video conferencing, real-time data sharing, and instant collaboration.
- AR/VR will become more integrated with smartphones, offering novel features like AR overlays on smartphone cameras.
- Demand for a circular economy will rise, addressing concerns about tech's environmental impact; green cloud computing will gain prominence.
- Automation, AI, and the Zero Trust approach will strengthen defences against evolving cyber threats; AI will act as both a threat and an ally.

The IoT will thrive in the 5G era, with faster and more reliable connections unlocking new possibilities in smart cities and industrial automation.

with predictive analytics and machine learning algorithms identifying and addressing potential bottlenecks for smoother connectivity and reduced downtime.

#2

ACCELERATING THE FUTURE OF CONNECTIVITY

The rollout of 5G and beyond is set to unleash next-generation connectivity, enabling ultra-fast data transfer rates, massive network capacity, and widespread device connectivity. This revolutionary shift will transform communication by supporting real-time applications, seamless video streaming, and the proliferation of Internet of Things (IoT) devices.

As telecom providers globally expand their 5G networks, we can anticipate a significant leap in network speeds and responsiveness, enhancing the mobile experience for users and catalysing innovations across various sectors. The IoT will thrive in the 5G era, with faster and more reliable connections unlocking new possibilities in smart cities, autonomous vehicles, and industrial automation.

#3

EMPOWERING REAL-TIME CONNECTIVITY

Edge computing, the processing of data and applications closer to the source, is poised to empower real-time communication. By reducing latency and improving responsiveness, edge computing will enable seamless video conferencing, real-time data sharing, and instant collaboration across geographically dispersed teams. This will be particularly beneficial for applications requiring low latency, such as remote surgery, autonomous vehicles, and immersive gaming experiences.

In 2024, the expansion of edge computing will bring computational power closer to the data source, reducing latency and enhancing data processing efficiency. This shift is crucial as the volume of generated data continues to skyrocket.

Empowering a new generation of edge devices, from AI cameras enabling real-time analysis of video feeds to servers facilitating faster data processing, edge computing will be at the forefront of technological advancements.

#4

MOVING BEYOND THE REALITY

Augmented and Virtual Reality (AR/VR) are poised to play

The expansion of edge computing will bring computational power closer to the data source, reducing latency and enhancing data processing efficiency.

an increasingly transformative role in our daily lives, reshaping how we communicate, collaborate, and find entertainment. As these technologies mature and become more cost-effective, their influence is expected to extend into nearly every facet of our lives, from work and education to leisure and social interactions.

In 2024, AR and VR technologies are expected to become more integrated with smartphones, introducing novel features like AR overlays on smartphone cameras. While the forthcoming launch of the Apple Vision Pro headset seeks to establish a presence in the uber-premium segment, Jio Tesseract initiatives in extended reality (XR) strive for accessibility, affordability, and widespread availability of such devices.

#5 ENABLING GREENER HORIZONS

As the world grapples with the escalating climate crisis, 2024 will mark a pivotal year for sustainability, driven by a growing recognition that traditional technological approaches often come at a significant environmental cost. This shift will be characterised by a heightened focus on aligning technology with environmental, social, and governance (ESG) outcomes, emphasising efficiency, circularity, and sustainability.

Emerging technologies like AI, IoT, and cloud computing, while offering immense benefits, have raised concerns about energy consumption and environmental impacts. In response to these demands, 2024 will see the rise of concepts, such as the circular economy, which promotes resource conservation and waste reduction, will gain prominence as organisations adopt strategies to extend the life cycle of products and materials. Green cloud computing, with its focus on energy efficiency and renewable energy sources, will play a crucial role in reducing the environmental impact of data centres.

#6 FORTIFYING TOMORROW'S DIGITAL FRONTIERS

In the face of an ever-evolving cyber threat landscape, cyber resilience has become paramount. Beyond traditional cybersecurity measures, cyber resilience

demands robust strategies for recovery and continuity. Automation, particularly through the integration of AI and machine learning into comprehensive frameworks, is spearheading cyber defense. The Zero Trust approach further bolsters security by challenging the conventional assumption of trust within networks.

The escalating sophistication of AI has spawned more advanced and intelligent AI-powered attacks, ranging from deepfake social engineering attempts to malware that dynamically adapts to evade detection. Conversely, AI serves as a powerful ally in our defence arsenal, enabling real-time anomaly detection, enhancing intelligent authentication processes, and automating incident responses.

NAVIGATING THE TECH HORIZON

The convergence of these technological trends is poised to revolutionise the future of communication and connectivity. Anticipate hyperconnected societies where seamless integration of communication technologies allows individuals to connect effortlessly with anyone, anywhere, and at any time. Personalised communication experiences will be the norm, as AI and ML tailor messages to individual preferences and needs.

AI-powered collaboration will usher in a new era, enabling real-time translation, language summarisation, and cross-cultural communication. Meanwhile, AR and VR technologies will create immersive communication experiences, blurring the lines between the physical and digital worlds.

The advent of edge computing and 5G will contribute to a decentralised communication infrastructure, reducing reliance on centralised servers. These transformative advancements will reshape how we communicate, connect, and interact with the digital world, emphasising the need for technology to serve as a force for good—fostering inclusivity, empowering individuals, and bridging the digital divide. 🌐

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GET READY FOR CONVERGENCE, CHANGING COMMUNICATION LANDSCAPE

In 2024, tech innovations will converge, driving personalised communication, secure networks, and IoT-driven revenue, but challenges demand strategic planning



BY SAMEER BAWEJA



By 2024, communication technologies are poised to experience significant advancements, particularly in the realm of huge network data analytics. Businesses will increasingly leverage advanced analytics to extract meaningful insights from vast, heterogeneous datasets, enhancing decision-making processes. Predictive analytics and Machine Learning (ML) algorithms will empower companies to anticipate customer needs and tailor communication strategies accordingly. Internal communication will be streamlined through smart collaboration tools, fostering seamless remote work and enhancing team productivity.

Moving forward, customer interactions will become more personalised, driven by real-time data analysis, leading to more targeted marketing and customer service efforts. Integrating emerging technologies like 5G and the Internet of Things (IoT) will further optimise communication infrastructure, ensuring faster and more reliable connections. As businesses harness the power of data analytics, communication will not only become

more efficient but also more strategic and tailored to individual needs.

INNOVATION, CHALLENGES, OPPORTUNITIES

The convergence of 5G networking and Artificial Intelligence (AI) will revolutionise global collaboration and remote work for businesses. The widespread adoption of 5G will offer unparalleled speed and low-latency connectivity, enabling seamless communication and collaboration across geographically dispersed teams.

AI, integrated with 5G, will enhance remote work experiences through intelligent automation, predictive analytics, and augmented reality. Advanced AI algorithms will optimise network performance, ensuring efficient data transmission and reducing downtime.

Virtual collaboration tools, empowered by AI, will facilitate real-time language translation, project management, and dynamic content creation. The combination of 5G and AI will break down geographical barriers, fostering a more immersive and responsive



IN BRIEF

- In 2024, the seamless integration of AI, 5G, and IoT will transform communication landscapes for businesses globally.
- Real-time data analytics will lead to highly personalised customer interactions, enhancing marketing and service efforts.
- The convergence of 5G and AI will empower virtual collaboration, breaking down geographical barriers for immersive and responsive work environments.
- The proliferation of IoT devices will enable businesses to monetise data, offering new services and products for sustainable growth.
- ML and AI will play a crucial role in proactive cybersecurity measures, ensuring businesses stay resilient against evolving threats in the dynamic landscape.
- Cloud adoption will bring scalability, but security concerns may require a delicate balance to maximise its value in a virtualised and open ecosystem.

virtual work environment. Businesses will experience heightened productivity and agility, as employees leverage cutting-edge connectivity and intelligent technologies for collaborative endeavors regardless of physical location.

As technologies evolve, businesses will increasingly adopt edge computing and distributed networks. The benefits include reduced latency, improved efficiency, and enhanced scalability. Edge computing allows processing data closer to the source, optimising real-time analytics and applications. However, analysing huge and distributed network data presents challenges. The sheer volume of data generated across decentralised nodes demands sophisticated analytics tools. Collecting and correlating vast data from diverse systems is another challenge.

Additionally, safeguarding the security and privacy of distributed data poses complexities. Businesses need robust solutions for secure data transmission and storage. Despite these challenges, the potential advantages in terms of improved performance, responsiveness, and resource optimisation position businesses to harness the full potential of evolving networking technologies, driving innovation and competitiveness in dynamic markets.

AI FOR EFFICIENCY, SECURITY

The year ahead will see businesses leverage AI in networking and communication to enhance efficiency, security, and innovation. AI-driven solutions will optimise network performance by predicting and proactively addressing issues, reducing downtime, and enhancing overall efficiency. Specifically, in terms of security, AI will play a crucial role in detecting and mitigating DDoS attacks.

Advanced ML algorithms will analyse network traffic patterns in real time, enabling rapid identification of abnormal activities indicative of an attack. AI can dynamically adjust security parameters, deploy countermeasures, and autonomously respond to evolving threats. This proactive approach enhances cybersecurity, ensuring businesses stay resilient against DDoS attacks.

Furthermore, AI will foster innovation by enabling the development of adaptive, self-learning systems that continuously evolve to counter emerging threats, providing a robust foundation for secure and innovative communication infrastructures.

IoT FOR NEW REVENUE STREAM

By 2024, businesses will leverage the proliferation of IoT devices for operational improvements, data-driven decision-making, and new revenue streams. The extensive deployment

Integrating technologies like 5G and the IoT will further optimise communication infrastructure, ensuring faster and more reliable connections.

of IoT sensors will enable businesses to collect heterogeneous communication and user data. This data, ranging from user behaviour to device performance, will empower organisations to make informed decisions.

Operational improvements will be realised through predictive maintenance, optimising resource utilisation, and enhancing overall efficiency. Data-driven decision-making will become more precise as businesses analyse diverse datasets to extract actionable insights.

Moreover, businesses will monetise collected data by offering new services, personalised experiences, and innovative products. Strategic partnerships and collaborations will emerge as businesses leverage IoT-generated data to create new revenue streams, tapping into the expanding landscape of interconnected devices for sustainable growth and competitive advantage.

THE CYBERSECURITY CONCERNS

In anticipation of the evolving landscape of communication and networking technologies in 2024, businesses should prioritise cybersecurity by integrating ML and AI into their defence strategies. ML and AI can handle the huge volume of heterogeneous data to predict and prevent security threats. Implementing advanced analytics enables proactive threat detection by identifying patterns indicative of malicious activities.

Real-time analysis of network traffic, user behaviour, and system anomalies enhances the ability to respond swiftly to emerging threats. Businesses should invest in adaptive security measures that autonomously evolve to counter new attack vectors.

Additionally, continuous training of AI models using up-to-date threat intelligence ensures robust cybersecurity postures. Collaborative efforts within industries to share threat intelligence can further fortify defences. By leveraging ML and AI for predictive and preventive security measures, businesses can stay ahead in the dynamic cybersecurity landscape in 2024.

GOING HIGH ON THE CLOUD

The adoption of cloud platforms brings significant benefits for enterprises, including improved scalability, cost efficiency, and agility. Cloud services empower

businesses to scale infrastructure dynamically, reducing the need for large upfront investments in hardware. This scalability fosters rapid innovation and quicker time-to-market for new products and services. Additionally, cloud platforms enable flexible and global work environments, enhancing remote collaboration and accessibility.

However, enterprises face challenges, particularly related to security concerns stemming from the virtualised and open nature of cloud platforms. The shared responsibility model in cloud security can lead to vulnerabilities if not managed properly, and businesses must navigate issues such as data breaches and compliance in this dynamic environment.

Ensuring robust security measures and compliance in a virtualised, open cloud ecosystem becomes imperative. Balancing the benefits of cloud adoption with these security challenges is essential for enterprises seeking to maximise the value of their cloud investments.

CONNECTIVITY, NETWORKING CHALLENGES

Enterprise CIOs will soon have to confront complex communication, connectivity, and networking challenges. Securing distributed networks, particularly amid the rise of IoT and remote work, will be a priority. Addressing cybersecurity risks associated with AI-driven systems is crucial. CIOs must also navigate the integration of AI into networking for enhanced efficiency while safeguarding against potential vulnerabilities.

Connectivity challenges involve seamless integration of diverse technologies, from 5G to edge computing, to optimise performance. Furthermore, analysing vast and heterogeneous data for informed decision-making and revenue maximisation introduces data management complexities. Ensuring user-friendly accessibility of AI-equipped IT tools for various departments, like sales and marketing, adds a layer of challenge. Navigating these intricate issues demands strategic planning, technological agility, and a proactive approach to evolving communication landscapes. 🌐

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SHAPING THE FUTURE OF COMMUNICATION TECHNOLOGIES

Together with Edge Computing, AI, and IoT, 5G will reshape communication with efficient data, real-time insights, and transformative connectivity

BY MANMEET SINGH



5G has prompted significant investments by telcos in network upgrades, fibre optic connectivity, and tower infrastructure expansion. This digital foundation is poised to support high-quality 5G experiences characterised by efficient data transmission and minimal latency. The introduction of 5G Fixed Wireless Access (FWA) services, exemplified by offerings like AirFiber, will enable telcos to extend their reach to regions where laying fibre proves challenging. Additionally, the bundling of services presents an opportunity for telcos to expedite the adoption of 5G fixed broadband.

With the rollout of 5G services, there is a noticeable surge in the demand for 5G smartphones. The active collaboration with Original Equipment Manufacturer partners positions us to anticipate larger volumes of affordable 5G phones entering the market.

Semiconductors remain pivotal in this landscape. The Government of India's policy initiatives and incentives

are strategically designed to attract investments and foster innovation in the semiconductor sector, aligning with the surging domestic and global demand. The burgeoning growth of 5G in India is set to further amplify the need for semiconductors.

TAKING ADVANTAGE OF EDGE

Edge Computing is a new way of looking at where and how information is accessed and leveraged. Capitalising on the Edge Computing paradigm is crucial in optimising performance, cost, and efficiency. This approach redefines where and how information is accessed, facilitating real-time data processing for immediate actionable insights. Going ahead, Edge intelligence will be a key enabler of autonomous devices like drones and robots, as well as smart applications.

The fusion of real-time data processing and Artificial Intelligence (AI) is poised to unlock the potential of predictive intelligence. As businesses embark on this transformative journey, the significance of data, data



IN BRIEF

- The rollout of 5G services will trigger a notable increase in demand for affordable 5G smartphones, shaping the market dynamics.
- India's semiconductor sector will witness strategic government support, aligning with the escalating demand fueled by 5G expansion.
- Edge Computing will transform data processing, enabling real-time insights and becoming pivotal for autonomous devices and smart applications.
- AI will emerge as a solution for enhanced performance monitoring, issue prediction, resource optimisation, and security in evolving network infrastructures.
- IoT will emerge as a transformative force, improving efficiency and impacting industries like healthcare, manufacturing, and logistics, and driving Smart City 2.0 initiatives.

privacy, and data security becomes paramount. By processing data locally at the edge, organisations can enhance security by minimising the amount of sensitive information that needs to be transmitted over networks.

MOVING AHEAD WITH AI

As the network infrastructure develops and evolves to handle increasing data volumes, traditional network management might prove inadequate. The year ahead will see AI emerge as a potent solution to augment and enhance performance monitoring, issue prediction and prevention, resource optimisation, and network security.

As Generative AI gains wider adoption, computing demand will surge, necessitating hybrid processing. A hybrid AI architecture will help efficiently distribute workloads between the cloud and edge devices such as smartphones, cars, personal computers, and the Internet of Things (IoT) devices, paving the way for more powerful and optimised AI solutions. The future trajectory of AI, however, lies in the development and implementation of hybrid architectures.

DELIVERING IMPACT WITH THE IOT

The IoT has emerged as a transformative force, enabling users to optimise operational efficiency through advanced connectivity, low power consumption, high-performance computing, robust security measures, and edge AI solutions. This evolution will extend beyond enhancing network efficiency to positively impact civic safety and device interoperability. Adopting IoT technologies will accelerate the digital transformation in many industries, including healthcare, manufacturing, agriculture, logistics and transportation.

Industrial IoT stands out as a rapidly growing application area, empowering enterprises to track the location and condition of their stock, thus helping them make their supply chains more efficient. In terms of consumer applications, expect relevant IoT use cases for connected homes, home surveillance, health monitoring, and more.

Looking ahead to 2024, IoT devices are poised to play a pivotal role in infrastructural connectivity, aligning seamlessly with initiatives like the Smart City 2.0 mission scheduled for launch in 2024.

The confluence of 5G, Edge Computing, AI, and IoT heralds a transformative era in communication technologies. The strategic interplay of these innovations not only addresses current demands but also lays the groundwork for a future where connectivity, intelligence, and efficiency converge to redefine the possibilities of technological advancement. As we navigate this dynamic landscape, it becomes imperative for businesses and industries to adapt, innovate, and leverage these technologies for sustained growth and competitive advantage. 🌐

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TRANSFORMING CONNECTIVITY, REDEFINING TECH POSSIBILITIES

Anticipate a landscape of ubiquitous computing, edge processing, and AI-driven applications to transform communication technologies in 2024



BY DR KUMAR N SIVARAJAN



The launch of 5G has triggered a massive multi-year capital expenditure cycle in wireline and wireless network infrastructure, both in India and globally. The average mobile data usage on a 5G connection worldwide is nearly double that of 4G, due to a greater propensity of consumers to use higher bandwidth applications. Beyond offering an enhanced mobile and fixed wireless connection, 5G is set to introduce diverse services in the coming year, leveraging the Internet of Things (IoT) connectivity, ultra-reliable low-latency (URLLC) communications, and network slicing.

These advancements pave the way for novel applications, including robotic manufacturing, remote healthcare, Virtual Reality and Augmented Reality, VR/AR-based learning, and smart farming using drones, promising transformative social impact.

In parallel, 5G is also unlocking opportunities for various industries like manufacturing, mining, and utilities, allowing them to achieve higher performance efficiencies, superior reliability, and secure communications through cost-effective private cellular networks. As India embraces large-scale electronic manufacturing, the country is poised to outpace its global counterparts in adopting 5G to improve industrial productivity.

The pandemic has heightened the urgency among Communications Service Providers (CSPs) to accelerate the rollout of both fixed and mobile broadband networks, and the need for addressing the persistent digital divide. While 4G and 5G will continue to dominate mobile network rollouts over the next few years, Gigabit Passive Optical Network (GPON) and 10 Gigabit Symmetrical PON (XGS-PON) technologies are preferred for Fibre-to-the-Home/Business (FTTH/B) deployments.

To cope with the resulting bandwidth surge, CSPs are augmenting the capacities of their Aggregation/Edge, Metro and Backbone networks by investing in higher-capacity optical transmission, packet switching and routing equipment based on advanced technologies such as Coherent DWDM, multi-terabit OTN, and IP/MPLS. CSPs are increasingly opting for converged wireline and wireless platforms, such as Tejas's TJ1400 UCB, that provide greater flexibility to deliver high-speed Internet services either as fibre broadband or as mobile and fixed wireless to reach customers in remote areas with difficult terrains.

EDGE AND THE AI FACTOR

Looking ahead to 2024, the landscape anticipates ubiquitous computing with fog-based architecture and



IN BRIEF

- Beyond improving fixed wireless connectivity, 5G is set to introduce diverse services, leveraging the IoT, URLLC communications, and network slicing.
- The advancements will propel applications like robotic manufacturing, remote healthcare, VR/AR-based learning, and smart farming.
- 5G will unlock opportunities for industries like manufacturing, mining, and utilities, enabling higher performance efficiencies and reliability.
- The proliferation of edge computing will push CSPs to invest significantly to support advanced applications.
- The year will see a gradual uptake of advanced AI use cases, such as load balancing, mobility optimisation, and precise user positioning.
- NarrowBand-Internet of Things will emerge as the de-facto IoT communications technology in service provider networks.

application designs. Newer applications, such as metaverse, Extended Reality, and VR that are more latency-sensitive will require distributed processing at the network edges. We are already witnessing data centres reaching deeper into cities, towns and sub-urban areas, instead of being limited to national and state headquarters, and one can expect this trend to continue beyond 2024.

The proliferation of edge computing will also drive CSPs to make significant capital investments to support these advanced applications and the ability to have some edge offload for peak compute and memory requirements. 5G rollouts will also require a few Core elements like User Plane Function (UPF) to move closer to the consumers to help reduce communications latency.

In terms of Artificial Intelligence (AI), its initial applications in service provider networks primarily revolve around network management automation and proactive monitoring using signal degradation information and other network alarms. However, advanced AI use cases, such as load balancing, mobility optimisation, predicting instantaneous channel models, and precise user positioning are gradually emerging. AI models for fault diagnostics and customer support, utilising data from OSS/BSS systems and with multi-layer network alarms, are also being actively explored by global CSPs.

A CASE FOR THE NB-IOT

NarrowBand-Internet of Things (NB-IoT) is emerging as the de-facto IoT communications technology in service provider networks. While IoT devices are being widely deployed by multiple industry verticals, the pace of their deployment has been relatively slower compared to mobile handsets. However, the advent of NB-IoT sensors for industrial monitoring is expected to drive its widespread adoption.

Challenges include the need for a common middleware to handle and process the information generated by diverse IoT devices. The continuing use of IoT devices based on legacy 2G/GPRS and unlicensed Long Range (LoRA) and ZigBee standards is another limiting factor. Nevertheless, service providers have a clear opportunity to develop industry-specific solutions and handhold customers to maximise the revenue generation potential of IoT use cases.

The emergence of evolving technologies like 5G, Edge Computing, AI, and IoT, and their convergence will paint a transformative picture for communication technologies in 2024. Beyond addressing current challenges, this synergy will pave the way for a future where connectivity, intelligence, and efficiency redefine technological possibilities.

As industries navigate this dynamic landscape, strategic adaptation and innovation are essential to leverage these technologies for sustained growth and competitive advantage. 🌟

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LEVERAGE NEXT-GEN TECHNOLOGIES FOR SUSTAINED GROWTH

India's digital transformation, driven by the rapid adoption of 5G and evolving technologies, presents both opportunities and challenges for service providers



BY VIVEK KALRA



India is experiencing a substantial surge in 5G network deployments by service providers since the launch of 5G services in October 2022. The rapid adoption of 5G in the country can be attributed to the widespread availability of networks across urban and rural areas, cost-effective service plans, and the increasing accessibility of 5G-enabled smartphones. Projections indicate that the number of 5G subscribers in India is expected to reach 200 million in 2024 and is anticipated to grow exponentially to 800 million by 2028.

The digital landscape in India is undergoing significant transformation, driven by the proliferation of 5G. This technological shift aligns with the government's vision to establish a digitally empowered society and a knowledge-based economy. As the country embraces the potential of 5G, data traffic has doubled over the past few years and is poised to sustain a growth rate of 25-30% in the coming years.

In the evolving technology landscape of 2024, several key trends are shaping the strategies of service providers. The adoption of dual-vendor Secure Access

Service Edge (SASE) solutions is becoming crucial for bridging security and networking gaps. AI-driven routing technology is gaining prominence to meet the increasing bandwidth demands across core and metro networks. Additionally, the implementation of Artificial Intelligence for IT Operations (AIOps) is transitioning from a luxury to a necessity for efficient Software-Defined Wide Area Network (SD-WAN) management.

Unified and cloud-based management solutions are emerging as indispensable tools for service providers. Managed Service Providers (MSPs) continue to play a crucial role in the growth of SD-WAN, providing unified solutions and support. The advent of 800G networking is set to address the data-heavy demands of the evolving landscape, while sustainability considerations are becoming influential factors in the decision-making process for technology acquisitions.

AI FOR NETWORK MANAGEMENT

In the realm of network management, the integration of AI is poised to bring transformative changes. In 2024, one can expect AIOps to evolve into a necessity



IN BRIEF

- India's 5G subscribers' volume is likely to hit the 200-million mark in 2024, soaring to an unprecedented 800 million by 2028.
- The country's digital landscape will undergo a significant shift, aligning with the government's vision for a knowledge-based economy.
- Doubling in recent years, data traffic is set to grow at 25-30%, propelled by the transformative impact of 5G on India's digital sphere.
- Dual-vendor SASE adoption, AI-driven routing, AIOps necessity, and the emergence of 800G networking will drive service providers' strategies.
- AIOps integration will transform network management, enhancing end-user experiences by proactively troubleshooting and elevating operational efficiency.

The integration of 800G networking, along with sustainability considerations, will influence CIOs' purchasing decisions in 2024.

for transforming reactive processes into proactive strategies. This shift is expected to enhance end-user experiences as AI assists in troubleshooting network problems and elevates operational efficiency. The increasing proliferation of IoT devices and bandwidth-intensive applications, coupled with the growth of AI in both enterprise and consumer markets, will drive the migration to Wi-Fi 6E and the anticipation of Wi-Fi 7.

The year 2024 is earmarked as a period of preparation for service providers to deliver reliable and high-performing experiences to every device, connection, and user. Cloud-based management solutions will offer centralised visibility and enable rapid technology deployments, ensuring robust security and improved network availability. The combination of on-premises automation with cloud-based AIOps is expected to enhance efficiency and elevate end-user experiences, aligning with organisational objectives.

CHALLENGES FOR THE CIOs

With the massive changes in the communications landscape, CIOs may face challenges in managing the exponential growth of data. The rapid 5G and 4G adoption, along with increased smartphone usage, has led to an exponential growth in data usage with the average data traffic per smartphone in India touching 31GB per month, the highest globally. Predictions indicate a 20% growth in the next five years, reaching 70GB per month by 2029. Service providers confront the challenge of continually augmenting core and metro transport networks to meet the ever-growing demands of data traffic in their networks.

The integration of 800G networking, combined with sustainability considerations, is set to influence purchasing decisions. Striking a balance between on-premise and cloud-based AIOps solutions poses a challenge, necessitating careful navigation of internal and external partnerships.

In conclusion, the dynamic landscape of India's digital transformation, driven by the rapid adoption of 5G and evolving technologies, presents both opportunities and challenges for service providers. As the country navigates this transformative journey, strategic adaptation and innovative solutions will be essential for leveraging these technologies to ensure sustained growth and maintain a competitive advantage in the evolving communication landscape. 🌐

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NeevCloud unveils India's first AI SuperCloud



India-based cloud infrastructure company NeevCloud has launched the country's first Artificial Intelligence (AI) SuperCloud. The initiative involves deploying AI cloud infrastructure with 40,000 GPUs and storage valued at USD 1.5 billion by 2026. The India AI 2023 report of the Ministry of Electronics and Information Technology expects AI to add USD 967 billion to the Indian economy by 2035 and USD 450-500 billion by 2025 accounting for 10% of the USD 5 trillion GDP target by 2027.

The company aims to democratize AI and supercomputing access by introducing an 'AI Supercomputing as a Service' model, providing the world's lowest Cloud GPU prices at USD 1.69/hour, reducing costs by up to 50%. The initiative seeks to overcome challenges of affordability, billing, transparency, and personalized support for MSMEs, enabling enterprises and startups to leverage Generative AI for various use cases.

With a mission to empower India with innovative technology, NeevCloud aspires to create a next-generation cloud infrastructure, making AI cloud computing accessible to all enterprises and startups. The company envisions powering not only India but users worldwide with affordable cloud solutions for cutting-edge AI and ML workloads.

NeevCloud aims for a 25% market share in India's projected USD 17.8 billion public cloud services market by 2027. The company's journey began by addressing data centre inefficiencies for AI, ML, and HPC workloads through Varuna, a liquid immersion cooling system, achieving exceptional sustainability and reducing cooling costs by 90%. The SuperCloud also supports confidential machine learning in BFSI, automotive, and healthcare sectors, advancing AI strategies across industries.

PayU payment solution to power Motorola's online store



Online payment solutions provider, PayU has secured the exclusive role of payments partner for Motorola as the tech giant establishes its online store in collaboration with global enterprise digital commerce platform VTEX. The partnership aims to offer a seamless and secure payment experience for Motorola's customers in India, leveraging PayU's comprehensive payment options and industry-leading transaction success rates.

Motorola gains access to PayU's industry-leading Affordability Suite, boasting 150+ payment methods, including credit card EMIs, debit card EMIs, cardless EMI, and Buy Now Pay Later. This collaboration enables Motorola to enhance purchasing accessibility for a broader customer base, with the integration of PayU's Affordability Widget to make EMIs and various payment options more discoverable. The brand will efficiently manage its offer lifecycle – from sourcing and running to reconciling offers and settlements – utilizing PayU's Offer Engine.

The strategic alliance extends to benefiting Motorola through PayU's comprehensive analytics and reporting features, offering valuable insights into payment performance. With detailed transaction tracking, success rates, and key metrics, Motorola gains the necessary information for informed strategic decisions in its Indian business plans.

Motorola's partnership with PayU and VTEX signifies a commitment to enhancing the online shopping journey for its customers, ensuring diverse payment options, top-notch security, and streamlined processes. This strategic alliance not only benefits Motorola but also showcases the ready-to-use, pre-integrated payment solution offered by VTEX and PayU, providing companies with a shortcut to revenue and exceptional checkout services.

Tech M, AWS unveil Sports Cloud for immersive experiences

Tech Mahindra has collaborated with Amazon Web Services (AWS) to develop a sports cloud platform. The strategic collaboration agreement signed in September 2023 aims to bring sports institutions closer to fans and enhance digital capabilities for global sports organisations. The cloud offering, set to deploy in the second half of 2024, focuses on content engagement, customer data management, and sports analytics, leveraging augmented and virtual reality for immersive fan experiences.

The collaboration targets the growing demand for enhanced sports fan experiences, IoT adoption in sports stadiums, and data-driven insights. The platform, powered by AWS, integrates real-time analytics, artificial intelligence, machine learning, and Web 3.0 technologies. It utilises AWS native services like Elemental MediaLive and Elemental MediaConvert for broadcasting, Kinesis Data Streams for real-time data, and Managed Blockchain for resilient Web 3.0 applications. Amazon SageMaker will be used for AR/VR analytics, providing fans with virtual stadium tours and live event experiences.

Tech Mahindra aims to deploy its sports cloud offering to enhance the digital capabilities of sports leagues,



franchises, and organisations, providing immersive and personalised experiences to fans worldwide. Punjab Kings, a cricket franchise, has partnered with Tech Mahindra to engage fans through content, community, and commerce.

The platform is part of Tech Mahindra's NXT.NOWTM framework aims to disrupt the sports tech industry by creating personalised, fan-focused communities. AWS emphasises the potential to transform sports engagement globally through immersive experiences and data-driven insights, enhancing enjoyment for fans and productivity for sports organisations.

Lentra introduces AI-led intelligent lending cloud platform

Digital lending platform, Lentra unveiled its Intelligent Lending Cloud Platform, including three AI-driven products that incorporate 40 new functionalities, enhancing utility for Banks and NBFCs. The initiative addresses the growing demand for personalisation and localisation in India's credit consumption narrative. The cloud solution is also designed to address the evolving need for vernacular languages to expand reach, accelerate processing speeds, and reduce the cost of operation.

Ankur Handa, Chief Product Officer at Lentra, emphasised the company's commitment to harnessing AI's power for client accessibility. The Intelligent Lending Cloud aims to expand reach, accelerate processing speeds, and reduce operational costs through the integration of Vernacular Languages.

Rangarajan Vasudevan, Chief Data Officer at Lentra, highlighted the company's mission to democratise credit and foster financial inclusion through intelligent decisions.

Lentra's AI products and features focus on automating solutions for Banks and NBFCs, utilising Machine Learning Models for borrower segment identification and enhancing customer engagement with AI.

Lentra's innovative cloud lending platform anticipates market evolutions and positions partners ahead of the curve. Cyrus Daruwala, Managing Director at IDC, praised Lentra's intelligence-embedded solutions for creating a seamless and impressive lending experience, emphasising the importance of an excellent customer experience in the lending sector.

Lentra Convo, powered by AI, simplifies the loan origination journey with natural language conversations in multiple languages. Lentra Insights provides actionable intelligence for optimising credit policy, while Lentra Wingman supports underwriters by summarising financial information and guiding their focus on critical loan applications, streamlining decision-making.

Tata Comm to drive JLR's global connectivity and DX journey



Jaguar Land Rover (JLR) has announced a collaboration with Tata Communications to advance its digital transformation and support Industry 4.0 standards. Tata Communications will deploy a cloud-first, software-defined wide area network (SD-WAN) technology across JLR's 128 global sites, enhancing supply chain efficiency and security. The partnership aligns with JLR's Reimagine strategy for next-generation vehicle production.

The advanced global connectivity will facilitate AI-powered real-time data analysis, improving production line performance and enabling predictive risk management controls. This partnership aims to shorten manufacturing process upgrade times, enhance operational resilience, and increase agility to meet production demands. JLR anticipates significant cost savings and business benefits through scale and security. Tata Communications will complete the network transformation programme deployment by 2025.

Tony Battle, JLR's Group Chief Digital and Information Officer, emphasises the leapfrogging of networks into the future with SD-WAN, leveraging AI-powered automation for global efficiency. Sumeet Walia, Tata Communications' Executive Vice President, highlights the partnership's role in supporting JLR's digital transformation and commitment to sustainability.

JLR and Tata Communications have a longstanding partnership, with Tata Communications MOVE platform powering connected car solutions in over 600,000 JLR vehicles. The collaboration accelerates JLR's Reimagine strategy through synergies within the Tata Group and collaboration with leaders in their fields.

Anritsu enhances Vi VoLTE experience

Telecom operator, Vi has partnered with Anritsu to provide superior VoLTE connectivity, faster issue detection, and enhanced insights. The complex VoLTE architecture often poses challenges in identifying and resolving customer-impacting issues. Anritsu's solution offers comprehensive visibility across VoLTE dimensions, speeding up issue identification and resolution.

Anritsu's anomaly detection on VoLTE has reduced Vi's mean time to issue resolution by 30%, addressing real-time concerns crucial for subscriber experience. The solution detects and isolates root causes, providing actionable intelligence to relevant teams. Deployed in Vi's Open Universal Hybrid Cloud, Anritsu's cloud-first applications contribute to significant savings in capital and operational expenditures.

Jagbir Singh, Vi's Chief Technology Officer, emphasises the proactive detection, isolation, and diagnosis of customer-impacting issues, resulting in a notable improvement in VoLTE experience. Anritsu's ML-based solution aligns with Vi's business objectives, offering end-to-end VoLTE visualisation. The collaboration aims to deliver best-in-class VoLTE services as Vi moves towards 5G.

Qualcomm to integrate NavIC L1 signals

Qualcomm Technologies and the Indian Space Research Organisation have announced their collaboration to incorporate support for India's navigation satellite system NavIC in select Qualcomm chipset platforms. This move aims to accelerate NavIC's adoption and improve geolocation capabilities in mobile, automotive, and Internet of Things solutions.

The Qualcomm Location Suite will now support up to seven satellite constellations concurrently, utilising NavIC's L1 and L5 signals for more accurate location performance and faster time-to-first-fix position acquisition. This will benefit mobile, automotive, and IoT platforms, improving user experience for location-based applications, especially in dense urban environments.

Support for NavIC L1 signals will be integrated into select Qualcomm Technologies' chipset platforms in the second half of 2024, with commercial devices expected to be available in the first half of 2025. Qualcomm Technologies plans to demonstrate NavIC L1 signal support in Snapdragon Mobile Platforms at the Qualcomm Innovation Forum event in Bengaluru in mid-December 2023.

EXPLORE THE TECH INTEGRATION RESHAPING PEDAGOGY AT THE DATAQUEST SPECIAL EDITION ON DQ-CMR DIGITAL INDEX SURVEY 2023.

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Decoding the right regulation for satcom services

DoT is yet to decide how satellite spectrum will be made available to telcos in India; the right decision can make or break this nascent sector



BY VERNIKA AWAL

During the past year, satellite communications services or satcom have gained much prominence in India. With a massive market opportunity that is pegged to be worth over USD 263 million by 2028, satcom services are understandably being touted as the next big frontier for telecom operators to focus on. However, while Jio and Airtel have both announced that their services are ready to commence, the most crucial piece of the jigsaw is missing at the moment – the spectrum itself.

Conflict around giving stakeholders of the industry access to satellite spectrum was driven by letters written by Reliance Jio and Vodafone Idea, to the Telecom Regulatory Authority of India (TRAI). In these letters, the

telcos argued that administrative allocation of shared satellite spectrum could potentially kill commercial incentives and advantages for these firms. As a result, a faction of the industry, largely led informally by Reliance Jio, demanded an auction of spectrum.

WHAT IS THE INDUSTRY PRECEDENT?

Industry stakeholders say that when it comes to the satcom industry, all global precedent points to the administrative allocation of satellite spectrum. Lt Gen (retd) Anil Kumar Bhatt, Director General of the space industry body, Indian Space Association (ISpA), said in an interview with Voice&Data that there are “no” global auction models when it comes to satellite spectrum. TV Ramachandran, President of Broadband India Forum



“Spectrum auction of satellite services is banned in the United States to prevent any anti-competitive market practices.”

TV Ramachandran

President, Broadband India Forum



“Auctioning spectrum to a private entity could lead to enabling a highly anti-competitive market environment.”

Lt Gen (retd) Anil Kumar Bhatt

Director General, Indian Space Association

(BIF), also concurred, thereby suggesting that industry presentations to TRAI regarding spectrum auction or allocation have mostly gone in favour of allocation.

Certainly, Voice&Data's research reveals that all nations with active satcom services have so far opted for administrative allocation, placing Jio's pitch for auctioning of satellite spectrum at a disadvantage. At least two senior industry officials with knowledge of the matter, who requested anonymity, as well as ISPA's Bhatt, said that during TRAI's industry consultation periods, all space sector firms presented in favour of administrative allocation from the Centre.

Ramachandran clarified that there is no constitutional legislative requirement mandating spectrum auctions. He also highlighted that the Supreme Court's judgement related to spectrum allocation is often misunderstood. “In its advisory jurisdiction in the Presidential Reference in the 2G spectrum case, the apex court said that auction, as a method of disposal of natural resources, cannot be declared to be a constitutional mandate under Article 14 of the Constitution of India.

He further referenced the Supreme Court's ruling, pointing out that, while auction might maximise the revenue, it may not always be the optimal approach to serve the public good, considering connectivity and the network as public goods.

WHY IS AUCTION AN ANOMALY?

Explaining why most industry stakeholders are against spectrum auction, Bhatt said that since satellite spectrum fundamentally differs from terrestrial spectrum, the former is best utilised when shared by all operators. “Auctioning spectrum to a private entity could lead to enabling a highly anti-competitive market environment,” he said.

Industry stakeholders and veterans believe that if satellite spectrum is privately auctioned to specific firms, the latter will have the ability to control access to satellite spectrum, which in turn could hamper the overall health

of a sector in terms of its commercial viability. This, in turn, would mean that instead of applying for spectrum allocation to the Centre, startups or even global firms would be at the mercy of private firms owning satellite spectrum to offer them access, and also define market standard pricing models for access to satellite spectrum.

Ramachandran further highlighted that spectrum auction of satellite services is banned in the United States, to prevent such anti-competitive market practices.

IS THERE A WAY FORWARD?

At the moment, the verdict on how satellite spectrum access will be enabled hangs in the balance. Senior industry officials who requested anonymity said that the retirement of former TRAI chief, PD Vaghela, has delayed the matter significantly since the new TRAI administration will take its own time in gaining full industry confidence and understanding of the matter, before offering its recommendations to the Ministry for the final decision.

However, space sector startups have pointed out that auctioning satellite spectrum will be detrimental towards global investor confidence in the business health of the satcom market in India. A fundamental difference lies in that when spectrum is administratively allocated, firms pay a certain fee to the Centre to lease satellite spectrum. However, the latter is shared among all companies that apply and is thereby not restricted in terms of access by any private entity.

Senior officials with knowledge of the matter indicate that TRAI is close to issuing its recommendations, thus suggesting a potential resolution to this issue by the end of this fiscal.

With the entire industry's health hanging in balance, and global majors knocking on the door, it remains to be seen what course of action the industry takes, and where satcom eventually ends by the end of 2024. 🌟

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Your bills in India. As cheap as a haircut!

The voice and data rates in India are the most affordable in the world. Have telcos in India cracked some magical formula and can others catch up?



BY PRATIMA HARIGUNANI

You must have picked your jaw from the floor in some store in a foreign country at some point in life, after hearing about the shockingly expensive data and calling rates there for the first time. You must have wondered why India is so low on its rates in comparison and whined a little less about call drops when back on your soil.

Well, it's kind of a jolt to many jaws. India keeps hovering around the fifth or third position on the ranks of the cheapest rates for 1 GB of data; the average cost is, often, somewhere between Rs 12–13 for 1 GB of data. The World Mobile Data Pricing Report 2022 put India amongst the top five countries with the cheapest mobile data plans. India (USD 0.17) is tucked comfortably between USD 0.04 for Israel and USD 41.06 for Saint Helena, a British Overseas Territory in the South Atlantic Ocean when we look at an average cost of 1GB of data.

Turns out that Sub-Saharan Africa is the fourth-most expensive region in the world for mobile data generally. The average price of 1GB of mobile data in all four North American countries goes past the global average of USD 2.59, making it the most expensive region overall—as

picked in a recent Cable.co.uk report. India, again, was in the 'cheaper' league here at 0.16 USD for 1GB.

So, are we really that lucky? How? And how long will this gap between India and other countries persist? Let's do some hair-splitting.

CRACKING THE 'LOW-COST' MATHS

As explained in the report from Cable.co.uk that measured the average cost of 1 GB in 237 countries across 5,600 mobile data plans, "Countries with long-established, ubiquitous 4G or new 5G infrastructure tend to fall towards the cheaper end of the table—as mobile data plans tend to offer considerably more data than the global median, caps usually in the hundreds of gigabytes, or even completely unlimited. The cost per gigabyte in these countries will tend therefore to be very low. Countries with little to no fixed-line broadband availability therefore rely heavily on mobile data provision. In these cases, mobile data is the primary means the population has of getting online, and adoption is often near-ubiquitous."

Another interesting observation is that when populations can afford to pay more, and network



“The average speed on the Jio network is much lower than on Finland’s DNA so the Finnish price also reflects a quality difference.”

Petrus Potgieter

Associated Partner, Strand Consult

infrastructure costs that much more to own and run, data pricing leans towards the global average. More so, when these regions haven’t reached the ‘excellent infrastructure’ category where data limits are beyond normal usage or entirely unlimited.

Sourav Gupta, Telecom Analyst, Omdia attributes India’s price card to competition. He explains that in India Data and call rates are available at cheaper rates due to the increased competition mainly from the country’s leading operator Reliance Jio. “Previously, state-owned operator BSNL was widely known for providing the cheapest mobile plans but Jio disrupted the market after its entry in 2016, providing free 4G data and voice services for more than a year. This was the major time when India witnessed a significant dropdown in mobile plan pricing. By providing the most affordable mobile plans, Jio has compelled other operators to lower their plan prices.”

John Strand, CEO, Strand Consult also throws light on how the cost of spectrum and building and operating telecommunications networks is markedly different. “In addition, you have low sales costs when you go out and get customers. On top of that, customers often use significantly less traffic than in countries like Denmark, the UK, and Finland.”

Gupta also reminds us how looking at the high rural coverage and average disposable income of people in those regions, operators started focusing on tapping those uncovered areas to gain more subscriber share and hence lowered the prices of mobile plans. “This ongoing competition between operators to garner a share of the untapped market is driving India to offer one of the most affordable mobile plans in the world.”

Fundamentally, a significant part of the price difference is accounted for by the difference in the relative cost of services in the two countries, opines Petrus Potgieter, Associated Partner with Strand Consult. “Consumer mobile prices have a large component that reflects the cost of retail and marketing. Add to that the labour costs

in running the network (presumably lower in India) and you can explain a lot of the price difference.”

But are we stacking up oranges against oranges or huge lemons here? We still need to look beneath the crust- with a look at the prepaid vs. postpaid angle too.

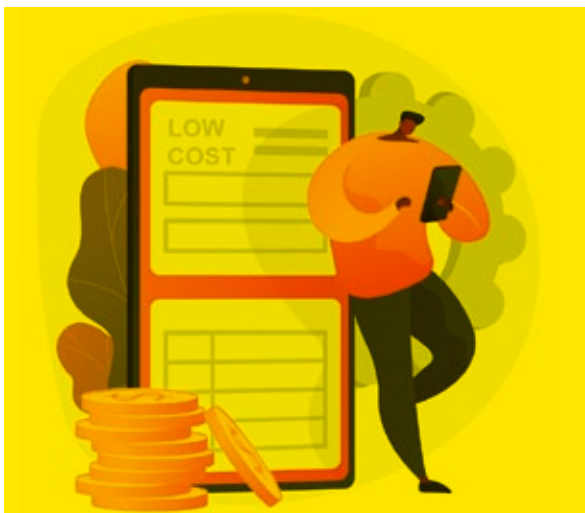
POUND-TO-POUND COMPARISON?

Well calls and data are affordable almost everywhere now, contends Potgieter as he hints at how we might need a new lens for this question. “International price comparisons usually deliver very problematic results because it is not reasonable to compare the price of a gigabyte of prepaid data in a market which has mostly postpaid customers to one in which most customers use prepaid. In a mainly postpaid market, such as the US, many customers will be on an unlimited data plan and these data points are usually not included in a comparison.”

Potgieter explains with an example. “Consider the Jio advertised rate of 181 rupees for 30 GB for 30 days which is roughly Euro 2. In Finland, we can compare this to Euro 20 for unlimited 4G data for 30 days at 100 MB/s service speed on the network DNA. The average use in Finland is about 60 gigabytes per month so, on average, this would be Euro 10 for something compared to the Jio package. Already the affordability is the same as I understand that Euro 2 can buy a men’s haircut in India and you could maybe buy a men’s haircut in Finland for Euro 10.”

A better way to compare is to look at network revenue from services and then divide it by a measure of the network traffic, he suggests. However, this data is much more difficult to obtain and handle than prepaid prices.

Potgieter stresses comparing price with quality as well. “The average speed on the Jio network is much lower than on Finland’s DNA so the Finnish price also reflects a quality difference. Add to that the value of the optionality of unlimited service and I no longer find the Jio price incredibly low.”



WHY LOW COST?

- **Intense competition:** Fierce competition, notably from Reliance Jio, triggered a significant drop in mobile plan pricing.
- **Economies of scale:** India's large population creates economies of scale, allowing telecom operators to offer affordable plans.
- **Technology efficiency:** New entrants benefit from more efficient technology without legacy burdens, enhancing cost-effectiveness.
- **4G and 5G infrastructure:** Well-established 4G and emerging 5G infrastructure contribute to lower data prices in the country.
- **Limited broadband options:** Areas with limited fixed-line broadband options heavily rely on mobile data, impacting pricing dynamics.
- **Market dynamics:** Competitive market dynamics and the presence of multiple players contribute to lower pricing.
- **Government initiatives:** Regulatory policies and government initiatives play a role in maintaining affordability in the telecom sector.

Remember that the quoted price per gigabyte depends on the consumer's ability to effectively use that much data which is possible only if network quality is reasonable, Potgieter underlines. "Finally, India has a high population density which probably reduces the cost of network rollout and very high levels of competition in the mobile market."

There is also a play of Economics here that cannot be ignored. The emergence or expectation of a duopoly or monopoly market can also affect these price equations.

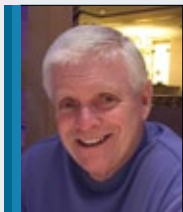
Asking an Economics expert should help. Lawrence A Gordon, EY Alumni Professor of Managerial Accounting and Information Assurance, Robert H Smith School of Business unwraps this side.

"In the US, for example, a few major telecom companies like AT&T, Verizon, and T-Mobile make up a very large percentage of the market. In India, there seems to be a larger number of key players in the telecom industry. India's population is such that a company can more easily reach economies of scale. This is an important factor since telcos have to invest a substantial amount into building infrastructure. Besides, there are substantial fixed costs for the player in this sector."

But Strand dismisses the angle of the number of players. "It is not the number of players that creates competition in the telecommunications market." In a recent report, Strand Consult argued that competition in these mobile network and infrastructure markets is not driven by the number of providers, but rather, by technology. If an operator does not upgrade its network to the latest technology, it will lose market position. Similarly, if an infrastructure provider does not innovate its equipment, it will lose customers.

Potgieter explains it from the angle of static and dynamic efficiency. "Static efficiency means that competition in current products and services is high but dynamic efficiency means that there is investment that will enable future competition for new products and services. Dynamic efficiency is the basis for competition and innovations. I do not think a duopoly (or even a local monopoly) is essentially a problem, provided that there is a relatively low barrier to entry for competing products and services."

The way he sees it, markets that are not too hemmed in by regulation rapidly discipline exploitative monopolies or duopolies. "We see this in software, where Microsoft still has an overwhelming market share in the desktop operating system and office applications but faces the discipline of competition at the edge from Apple, Google's



“India’s large population gives companies the economies of scale, an important factor since telcos have to invest substantially into building infrastructure.”

Lawrence A Gordon

EY Alumni Professor, Managerial Accounting and Information Assurance,
Robert H Smith School of Business

Android, Linux and others. Mobile operators face competition from satellite and fibre.”

Gordon reminds us how all this is more complicated than just looking at comparative advantages. “There are national security issues that come into play when thinking about the telecom industry.” He also touches on the role of the state. “I would assume that the government plays a significant relative role in terms of incentivising the sector and regulating it to keep prices low, given that the country’s per capita GDP is quite low.

ZOOM IN ON INDIA, AND CORPORATE

Does the overall difference though mean that Indian telecom players are doing something, particularly right or differently? Scale is a keyword, just look at how the economy has developed in India after consolidating the market, Strand points out.

Frankly, a new broom sweeps clean and there are significant advantages to scale, warns Potgieter. “Because the technology, including software, becomes more efficient and new firms are less burdened by legacy applications and services, new entrants have distinct advantages, especially since customers can very easily switch. Switching cost for customers is much lower now because the mobile number is no longer the only way to reach a person.

Social networks provide the primary means of identifying the user. Successful telcos have been able to provide additional services to their users that discourage users from defecting to another network. This often includes financial and entertainment services. It is even possible that the successful mobile network of the future will make little or no money from network services but rather be profitable because of the additional services it can offer its users.”

While talking of bills, we also need to look at what comes on the desks of enterprises.

As Strand observes, “You have to shift the focus from consumers vs. enterprise. It is important to understand that many customer segments use the products differently. This is especially true among enterprises in India, with some



TARIFF SUSTAINABILITY CHECK

- **Debt dependency:** Operators sustain low prices by accumulating debt, posing long-term financial challenges.
- **Price war risk:** Ongoing competition, especially from Reliance Jio, prevents tariff hikes, but it risks a detrimental price war.
- **Overregulation impact:** The telecom industry faces excessive regulation, hindering flexibility and competitiveness.
- **Technology upgrade costs:** Scale demands continual investment in network technology, posing financial challenges for operators.
- **Post-5G outlook:** Anticipation of the 5G rollout and the 2024 general election may lead to an increase in mobile plan costs.

After the full rollout of 5G and the 2024 general election, mobile plans might become more expensive, posing challenges for operators.

customer segments opting for the most advanced solutions. But there also voice-centric customers who are not so advanced.”

AS CHEAP AS A HAIRCUT AFTER 2023?

The big question is whether Indian players can maintain this affordability edge and whether markets like the US and UK change in the future.

This affordable model is not sustainable, Gupta lays it down with no words minced. “Operators like Bharti Airtel have always pin-pointed affordable mobile plans and a motive to increase their prices. However, tough competition from Jio stops them from doing so,” he augurs, adding that after the full rollout of 5G in India and the general election in 2024, mobile plans might become a bit expensive.

It is a model that is probably not sustainable—in the gaze of Potgieter as well. “At current prices, operators in India can probably not fund network investment in any other way than taking on more debt. Operators are likely hoping to ride out a price war in the expectation that they will be one of the three or so operators that remain. Throughout the world, we see very few markets with four nationwide operators. There is simply no justification for that much duplication of infrastructure, plus the inefficiencies in spectrum use that it implies.”

He cites the example of South Africa, “It has a mature market with affordable and high-quality mobile broadband with only two nationwide physical networks supplemented by additional networks in the cities and large towns and extensive roaming and spectrum sharing agreements between the operators. The prepaid data prices are much higher than in India but there is competition from low-cost fibre in the cities and towns and operators can invest.”

Network economy is important and again, scale is the key word, Strand says talking about sustainability of low-price models. So, there are a lot of socks that telcos will have to pull up whether they are in the US or India. And a lot of mitts too as they touch hot, and unfamiliar, rivals and technologies.

Strand has a recommendation that takes us back to some recent industry debates. “Accept that telecommunications companies need volume, today it is the case that telecommunications companies are overregulated while OTT players such as Google, Microsoft, AWS, Facebook etc. are not subject to the same regulation as the telecommunications companies they often compete with.”

Ask him about recommendations for telcos or regulators and Potgieter also calls some elephants in the room. “Telecom firms are now heavily over-regulated, especially when compared to the software and service technology giants such as Alphabet, Amazon, Meta or Microsoft which have most of the sway in the market for online services. This over-regulation is a legacy of the time when regulators were rightly trying to ensure competition with dominant state-owned legacy operators. It should be dismantled. Regulators should oppose mergers and other forms of consolidation, such as spectrum or infrastructure sharing, only in extreme cases.”

Telecom service providers can partner with private and government players in the education and healthcare ecosystem and provide them with new-age digital technology solutions to enhance the quality of life in those rural regions, advises Gupta. “This move will act as a reduced need for expensive physical infrastructure which has been the major roadblock in both the sectors for several years while also creating a new revenue stream for telecom operators and helping them combat competition.”

As to whether the lower rates are sustainable, Prof. Gordon chooses to reverse the question and ask if the higher rates are sustainable. “In the long run, my answer to the latter question would be No.”

New bundles. New partners. New models. New customers. New rate cards. Now that would be a change that will be more than a haircut for telcos, be it in India or another country out there. And quite a jawbreaker candy for customers! When that happens. 🍬

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[INTERVIEW]

HARDWARE



Keith Witek

Chief Operating Officer, Tenstorrent

“The RISC-V train has left the station and it is unavoidable”

In the dynamic landscape of AI hardware development, major players such as Google, AWS, Nvidia, AMD, IBM, and Microsoft have all embarked on the journey of unveiling or planning AI chips and underlying hardware innovations. Amidst this bustling activity, Tenstorrent stands out as a company with a unique focus. Beyond its diverse initiatives, the company is actively engaged in advancing RISC-V, which it touts as a superior technology capable of outperforming ARM, ultimately aiming to bring greater independence to processor architectures.

Keith Witek, Chief Operating Officer at Tenstorrent, in interaction with Pratima Harigunani, delves into the profound impact of AI on hardware, exploring topics such as reusable chiplets, the significance of RISC-V, AI-powered software, 5G, and the role of non-proprietary processors. Drawing on his extensive experience, he provides valuable insights into the future of chip technology. Excerpts:

What have been the key milestones in Tenstorrent’s journey, and what sets the company apart in the processor industry?

Tenstorrent builds computers designed for AI applications. Our core business includes the production of AI Chips, which we sell on PCIe boards, integrated into servers, and made available through our cloud. We also operate an IP Licensing business, showcasing our RISC-V and AI cores. The remarkable growth of our IP business has been a pleasant surprise. Notably, our significant RISC-V core is engineered to be part of our future AI

products and also function independently, capable of operating systems like Linux and Android. This versatility positions it as a host processor for a broad spectrum of high-volume applications.

Could you provide further insights into the emphasis on RISC-V?

We believe that the AI models of the future will require heterogeneous computing, combining our robust RISC-V CPUs with our AI graph cores. Unlike many current models constrained to run on just one type of hardware engine in isolation, such as GFX, CPU, etc., optimal results across a diverse range of models arise when the right mix and proportion of compute engines are assigned to a task, tailored to the specific requirements at hand. Both RISC-V and AI are experiencing rapid growth within our company, and we are very excited to offer this innovative technology and open business model to the global tech industry.

What motivated the choice of processors communicating directly over networks, and how successful has this approach been for Tenstorrent?

The simplest and most straightforward solutions are often the best ones. Opting for Ethernet as the fabric of our communication just made more sense. In contrast to purchasing expensive networking infrastructure and proprietary switches, our Ethernet approach strikes a balance between cost, flexibility, and performance. This strategy has proven highly effective for most requirements, resonating well with our customers. The use of Ethernet not only enhances cost efficiency but

“The AI models of the future will require heterogeneous computing, combining our robust RISC-V CPUs with our AI graph cores.”

Software continues to be the biggest challenge in ensuring the effective and reliable performance of high-performance computing and AI solutions.

also showcases our commitment to open and intelligent design decisions. This, along with other thoughtful choices, contributes to providing robust solutions for high-end compute and AI systems.

What differentiates AI and HPC workloads, and what should enterprises prepare for in this evolving landscape?

The primary difference lies in the software driving these workloads, prompting us to develop two distinct software stacks. First in line is Buda, our ML compiler that automatically takes models, compiles them, converts them into a graph, maps them to the available hardware, and executes the model with exceptional performance. Buda serves as our secret sauce for seamlessly managing AI and ML workloads, achieving automation, high performance, and scalability, all with a push of a button. Complementing this is Metal, our kernel-level bare-metal software stack. Unlike Compute Unified Device Architecture or CUDA, it offers AI, ML, and HPC engineers complete kernel access, including every register on every chip. While we provide a base set of libraries and several pre-written models in Metal, the true strength lies in its open-source nature, enabling HPC engineers to build the solutions that they want with our architecture.

How significant is the India centre and team to your portfolio and strategy?

The significance is immense. Our substantial RISC-V team in Bangalore is not only well-established but also steadily expanding. Tenstorrent President and CTO Jim Keller has committed to the IT Minister to sustain and augment our investments in India, a pledge we fully intend to fulfil. India plays a pivotal role in the technology ecosystem, particularly in software and silicon development.

Beyond this, India exhibits robust economic growth fundamentals with a well-educated and motivated population, a sizable market, a youthful demographic, and more. In the current geopolitical landscape, with East-West tensions prevailing, India is also emerging as a preferred geography for tech company investment and expansion. It is a supporter of our global AI and RISC-V open-source strategy, empowering countries and companies to own

and control their critical ecosystem technology without succumbing to the risks associated with monopolistic, proprietary, or geopolitical shifts in global policy.

Do Moore's Law, Wirth's Law, and Evan's Law of modularity affect the industry today? Are there any observations that stand out for you?

Moore's Law is not dead, but it is experiencing a gradual slowdown in its ability to deliver generation-on-generation benefits to the tech industry. Industry progress faces escalating challenges rooted in the basic laws of physics and chemistry. Furthermore, the costs associated with maintaining past benefits and sustaining the pace of improvement under Moore's Law are increasing exponentially. These dynamics are compelling the industry, out of necessity, to transition towards more cost-effective, reusable, and flexible ecosystems, exemplified by the adoption of technologies such as RISC-V, open AI, open-source software, and reusable chiplets.

Wirth's Law remains a persistent challenge as software complexity, line of code counts, and parameters in AI models continue to escalate seemingly without any apparent limit. Software continues to be the biggest challenge in ensuring the effective and reliable performance of high-performance computing and AI solutions. While AI holds promise in improving the design and development of software for these advanced hardware platforms, AI-powered software development has not yet fully materialized to offset the growing impact of software complexity and scale.

What about Neven's law?

Neven's Law suggests that quantum computing holds the potential to unlock future computing capabilities at a pace and scale unprecedented in the tech industry. However, quantum computing is still in its early stages and has yet to demonstrate widespread applicability to a broad set of common problems addressed by traditional computing. Despite its current limitations, there is optimism that ongoing research and innovation will lead to hyper-exponential expansion in computing capabilities in the coming years or decades.

There is a lot of action in the processor industry, from more cores, clocks, threads, and new architectures, to power efficiency, AI, accelerated cadence, APU, and NPU. What will ultimately define the winners in the sector?

My answer might not be the one you expect, but the ultimate winner will be the company that engineers its business to meet customer needs with solid performance, flexibility, cost-effectiveness, differentiation when needed, security of investment, and reliability. While technological prowess is undoubtedly crucial, customers are becoming more discerning. They no longer seek proprietary solutions that yield substantial gross margins for companies like NVIDIA at the expense of an ideally tailored solution. Winning companies will need technology that is powerful and efficient, but they must also prioritize meeting the evolving and sophisticated demands of their customers, avoiding solutions that are inflexible or susceptible to supply chain disruptions.

Please explain this.

Winning companies are those that can engineer both their business models and technology to empower customers with customized, affordable, low-risk, and performant hardware, intellectual property (IP), and chiplets. Even among smaller clients, there's a noticeable trend to independently develop, own, and control their differentiated technologies, System on Chips (SoCs), and systems, often seeking to license our IP for this purpose. Looking ahead, the expectation is that an increasing number of companies will opt to leverage chiplets to build their custom technology solutions. Those positioned for success will capitalize on the opportunity, and this is why Tenstorrent is offering SoCs and IP, and very soon chiplets to customers.

What are you particularly, excited about?

Everything! This is an exciting time in the market. RISC-V is becoming unavoidable and is poised to make a significant impact. Drawing a parallel, just as Linux is to Windows, RISC-V is to ARM and x86. The RISC-V train has left the station. AI is no longer a passing hype cycle; it is here to stay and will permeate all aspects of technology and vertical, making an impact across the global customer base. It will melt like the Internet or electricity in our daily lives in a ubiquitous way where we almost will not realize its constant presence.

Our approach with a heterogeneous graph architecture stands out as the optimal solution for modern and

emerging workloads. The overwhelming interest from companies licensing our IP to secure their future, manage costs, establish differentiation, and enhance security is astounding. The chiplet approach to solutions is poised to revolutionize time-to-market, costs, and innovation, and democratize tech development, extending its reach to a diverse array of market segments and customer demographics that were previously excluded from driving tech development and leadership for their core businesses.

How will 5G, Quantum computing, and silicon alternatives affect this space? Will Gilder's law be strong now?

The expansion of communication bandwidth and capability, along with infrastructure improvements that reduce latency, will facilitate optimized compute distribution between end and cloud. This optimization spans use cases, efficiency, cost, the emergence of new applications, and more. Compute operations can be done whenever and wherever needed, under any environment or contingency.

What kind of processors do the connected intelligent machines need? What are your views on this market?

While I touched on this earlier, it's evident that the market is trending towards the necessity for heterogeneous compute. This transformative shift is not unique to us; it is observable with AMD and Nvidia as well. The AI Chip industry is at an existential crossroads, where companies that built their hardware for current models may face challenges. As mentioned earlier, the models of tomorrow will demand heterogeneous compute, and Tenstorrent is at the forefront, actively leading this transformative charge.

What will be the future of the supply chain of processors and chip hardware? Will the bull-whip effect hold?

Unless a major disruption surfaces, chiplets are poised to shape the future of the supply chain. Chiplets drive faster time to market, greater flexibility, lower overall costs, the inclusion of new customers in the global tech development supply chain, opportunities for increased experimentation, innovation, and differentiation, as well as effectiveness in combining previously un-combinable technologies. 🧩

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How India is shaping up its first generation of AI laws

From creating a datasets platform under India AI strategy to signing the Bletchley Declaration, regulations are the centrepiece of debates



BY VERNIKA AWAL

India's tryst with regulating Artificial Intelligence (AI) has only begun and is expected to grow further as it proliferates every aspect of life. In this process, however, AI has also shown how it can be leveraged for the bad, such as in deepfakes strewn across social media. All of this has prompted the Government of India to focus on regulating AI as a standalone entity, in a bid to channel its development in the right avenues and penalise misuse.

Speaking at the recent Confederation of Indian Industry (CII)'s Global Economic Policy Forum, S Krishnan,

Secretary of the Ministry of Electronics and Information Technology (MeitY), highlighted that from the policy perspective, India believes that AI offers "more positives than negatives" and must therefore be leveraged for constructive tasks.

Highlighting that AI has the potential to have a transformative industry impact the way the Industrial Revolution did, Krishnan said that it is this potential that India wants to tap into. To do this, the Centre has identified four key challenges: access to compute, building organised data sets, developing skills, and

Bletchley Declaration seeks to define a common framework for building AI so that the technology does not get misplaced or is developed without guardrails.



“India is looking to get more of the global south involved to address the unique challenges that will need to be factored into AI development in the long run.”

S Krishnan

Secretary, Ministry of Electronics and Information Technology,
Government of India

prompting nationwide and global collaborative research on AI. Of these four, while India is at par or ahead of global counterparts in data availability, skills and research, it is access to compute across enterprises that presently poses a challenge.

Bias, too, presents an issue that India's own AI journey will look to tackle. To do so, India, during the Global Partnership on AI (GPAI) Summit in New Delhi between 12-14 December, will pitch to attract more nations to become a member of this global collaborative effort to regulate AI. “The membership is largely driven at present by OECD nations. India is looking to get more of the global south involved here, to address the unique challenges that will need to be factored into AI development in the long run. This is crucial,” Krishnan said.

“If we can train models in that way will be more suited to the rest of the global south as well, that is another important dimension. Our efforts towards Bhashini and a variety of others are in this regard,” he further added.

To be sure, this approach is in line with how the Centre seeks to draw the line when it comes to AI development. Historically, MeitY spokespeople have reiterated that India will not look to strictly regulate AI. Instead, it will only look at regulating the harmful aspects of AI. Krishnan, too, reiterated this approach.

The upcoming Digital India Act (DIA), which has now been stalled until the formation of the next government, is expected to handle how AI harm is regulated. The Digital Personal Data Privacy (DPDP) Act, which has already been notified, already announced guardrails for data collection in the development of AI.

On 13 October, Rajeev Chandrasekhar, the Union Minister of State for Electronics and Information Technology, said that a new report on the India AI strategy will look to define a roadmap for the creation of organised, centralised datasets for multiple Indian languages, and

also establish a plan to build indigenous compute power for AI tasks. The datasets project will involve lending access to Indian language data parameters to researchers, which will be crucial since the availability of data in non-English languages is still not elaborate.

Such datasets, however, are building—platforms such as OpenAI's Generative Pre-trained Transformer (GPT) models already support Indic languages, while Google's previous AI model, PaLM, also supported Hindi and other languages.

India, on this note, also became one of the first 28 signatories of the first global alliance on regulating AI. Called the Bletchley Declaration and signed in the UK on 1 November, it seeks to have nations, including the US and China, agree on a common framework for building AI so that the technology does not get misplaced or is developed without guardrails.

Speaking to the media after the UK AI Summit last month, Chandrasekhar shared that the Indian delegation stressed the need to have safe, trusted AI platforms, and distinguish them from unsafe, untrusted platforms. “We proposed that AI should not be demonised as it represents a massive opportunity, in India, as around the world. We also spoke about who will determine safety and trust and discussed four harms that come out of AI. These include workforce disruption, privacy impact on individuals, non-criminal harms, and finally, weaponisation and criminalisation of AI.”

Summing it all up, Krishnan said that India's AI regulatory approach will be “light touch”, akin to how it enabled the domestic IT services sector to flourish in the 1990s. By preventing harm, India seeks to enable the industry to pursue innovation in the field, while the development of local computing power could bolster these initiatives further. 🙌

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The cloud's knight in shining armour

SASE integrates SD-WAN and cloud-delivered security, ensuring unified cybersecurity with SSE components for efficient, cost-effective, and scalable protection



BY VIVEK SRIVASTAVA

If you aren't a cybersecurity professional, you might mistake Secure Access Service Edge (SASE) for an advanced algebra problem or perhaps a scientific formula. But IT professionals understand that at a high level, SASE is a solution that provides the hybrid workforce with consistent enterprise-grade cybersecurity no matter their location and is composed of both networking components, Software-Defined Wide Area Network (SD-WAN) as well as cloud-delivered security (SSE).

If drilled deeper though, the confusion about what SSE means and which cloud-delivered security solutions are necessary for a comprehensive SASE approach is still there. Not understanding each element and how they work together to protect the hybrid workforce can leave the organisation with an incomplete solution, management challenges, and, potentially, costly breaches.

SSE is a cloud-delivered security solution that ties together the four components namely, Firewall-as-a-

Service (FWaaS), secure web gateway (SWG), cloud access security broker (CASB), and zero-trust network access (ZTNA). Each of these products work together to secure users, devices, and edges to applications, no matter the location.

FWaaS: ONE SOLUTION FOR ALL

FWaaS allows organisations to move security inspection partially or fully to a cloud infrastructure. With security in the cloud, their solution is managed by the cloud provider, who maintains the hardware infrastructure that powers their solution. Many companies want a service-based architecture because it gives them the freedom to expand security coverage without having to provide new hardware. FWaaS is a one-solution-fits-all option, regardless of the size of the organisation.

With FWaaS, an organisation's distributed sites and users are connected to a single global firewall with a unified application-aware security policy, allowing them to better scale security. FwaaS provides the functionality



IN BRIEF

- SSE incorporates FWaaS, SWG, CASB, and ZTNA, forming a comprehensive cloud-delivered security solution.
- FWaaS offers a scalable, cost-effective, and unified security solution for organisations of all sizes.
- Secure Web Gateway provides robust protection against sophisticated cyber threats, enhancing internet security.
- Cloud Access Security Broker guarantees visibility, data security, threat protection, and compliance for cloud-based resources.
- Zero-Trust Network Access verifies users and devices, replacing traditional VPNs for a more secure network access approach.

of next-generation firewalls (NGFWs) including web filtering and intrusion prevention systems, such as IPS, DNS security, file filtering, and threat protection without the high capital expenditure costs associated with an on-premises wide area network (WAN) infrastructure investment. FWaaS technology also enables high-performance secure sockets layer (SSL) inspection and advanced threat detection via the cloud. It also maintains secure connections and analyses inbound and outbound traffic without impacting user experience.

SWG: PROTECTING AGAINST CYBERTHREATS

SWG protects against internet-borne attacks by securing user internet connections. As threats grow increasingly sophisticated, attackers are working overtime to infiltrate the network and remain hidden for as long as possible.

SASE offers a more streamlined and efficient way to manage and secure network traffic, especially in the context of a hybrid workforce.

For complete protection against internet-borne attacks, the SWG should have the following features: intrusion prevention to block threats, DNS filtering to protect against sophisticated DNS-based threats, and sandboxing to isolate potential malicious code. Traditionally, SWG has been delivered with on-premises firewalls or dedicated proxy appliances, but with SASE, SWG is delivered as a cloud-based proxy within the SSE.

CASB: SECURING CLOUD-BASED RESOURCES

CASB sits between users and their cloud Software-as-a-Service (SaaS) applications to enforce security policies as users access cloud-based resources. The four pillars of CASB are visibility for all cloud applications, built-in data security, advanced threat protection, and compliance based on the industry.

Specifically, CASB provides a comprehensive visibility of cloud application usage, such as device and location information, to help organisations safeguard data, intellectual property, and users. It also provides cloud discovery analysis, which enables organisations to assess the risk of cloud services and decide whether to grant users access to applications. CASB solutions must include DLP tools so organisations can monitor sensitive information moving between and across their on-premises and cloud environments to prevent data leaks.

CASBs also enables organisations to protect themselves against insider attacks from authorised users. They can create comprehensive usage patterns to use as a baseline when identifying anomalous behaviour, empowering organisations to detect improper access or attempts to steal data as soon as it happens.

ZTNA: SAFEGUARDING PRIVATE RESOURCES

ZTNA solutions verifies all users and devices when they attempt to access corporate applications and data. Verification continues after the user is granted access and moves through the network. Applying the ZTNA approach to application access allows organisations to quit using traditional virtual private network (VPN) tunnels, which allows unrestricted access to the entire organisation's network.

CASB sits between users and their cloud Software-as-a-Service applications to enforce security policies as users access cloud-based resources.



INTEGRATED CYBERSECURITY

- Combining cloud-delivered security with SD-WAN ensures a unified and integrated approach to cybersecurity.
- A single-vendor solution simplifies management tasks, providing a centralised console for security and networking features.
- The integration optimises traffic flow between users, applications, and the cloud, reducing latency for enhanced performance.
- Managing security and networking through a single vendor eliminates the need for multiple vendors, reducing costs.
- Cloud-delivered security, when added to SD-WAN, offers holistic protection against cyber threats for a hybrid workforce.
- The combination of SD-WAN and cloud-delivered security ensures efficient connectivity and an optimal user-to-application experience.

Implementing ZTNA requires strong authentication capabilities, powerful network access control tools, and pervasive application access policies. For example, consider a person checking into a hotel who is provided with a keycard to access their room. This is how ZTNA works. On the other hand, a VPN is more analogous to someone receiving a key that opens every room in the hotel.

SINGLE-VENDOR SASE APPROACH

SSE is a critical component of SASE, but it's only one-half of the equation. SD-WAN is the other half and is key because it provides efficient connectivity and optimum user-to-application experience.

The cloud-delivered security must work seamlessly with the SD-WAN solution for a comprehensive and easy-to-manage SASE deployment. This is best achieved through a single-vendor approach because it can offer integrated security across all users, applications, and devices. It also helps simplify management by providing a single management console for all the security and networking features, while enhancing performance by optimising the flow of traffic between the users, applications, and the cloud, reducing latency. The approach also helps in reducing costs by eliminating the need to manage multiple vendors and their products.

SASE is still a relatively new solution, so it's continuing to evolve and is no longer just a buzzword. It offers a more streamlined and efficient way to manage and secure network traffic, especially in the context of a hybrid workforce. A properly deployed solution protects connections to and from the internet as well as SaaS and private applications.

And to make sure no advanced threats penetrate the network, devices, or edges, the cloud-delivered security solutions within SASE need to be kept current and be upgraded to include the latest developments to protect against emerging and ever-evolving cyberthreats. 🧩

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Gearing up for a trillion-dollar growth prophecy

Hyper-connectivity, AI surge, and evolving trends set the stage for a data centre evolution with massive investments and transformative impacts



BY VIPIN JAIN

By the time you are halfway through reading this article, close to 8 million search queries will have been generated on Google. That's just one example of living in an always-available, hyper-connected world. While the exact number is not known, it is estimated that 120 zettabytes of data and information are created, captured, copied, and consumed each day. This data needs to be stored and computed in a centralised place equipped with up-to-date computing and networking equipment to process and manage it. Data centres, the unsung heroes of the digital age, play a critical role in this scenario.

India finds itself on the cusp of a significant IT evolution, where data centres will play a pivotal role in keeping data at the center. The stage is set for both

Indian and foreign companies to invest over Rs 1.5 trillion in the next six years, marking a six-fold growth. The country's data centre industry's revenues are expected to grow at a CAGR of 17-19% between FY23 and FY25.

The increasing adoption of technologies such as cloud computing and Artificial Intelligence (AI) across industry verticals has led to rising demand for high-quality data centre infrastructure for storage and networking. Predictions indicate that the generative AI market will surge from USD 40 billion in 2022 to USD 1.3 trillion over the next decade. Applications utilising generative AI require substantial computing power and data storage, prompting data centres to invest in and extend their infrastructure to meet this rising demand.

Data centres must go beyond basic infrastructure and offer solutions like managed services, cloud support services, and fibre connectivity.

NEED FOR INFRASTRUCTURE

Data centres are the world's greatest energy guzzlers and applications using generative AI need a lot of computing power and data storage devices. This is pushing data centres to invest in and extend their infrastructure to handle the rising need for processing power and storage capacity as the adoption of generative AI increases, which will alter the data centre landscape.

Estimates indicate that generative AI data centre server infrastructure plus operating costs will reach more than USD 76 billion by 2028 if current trends continue. This growth will put pressure on the profitability of emerging services such as search, content creation, and business automation that use GenAI.

Besides, the data centre infrastructure also needs to evolve to meet these requirements. Several technology trends and capabilities play a crucial role in addressing these requirements.

Scale of operation: The shift towards large campuses is essential, leveraging synergies such as power availability, substations, fibre availability, and utilities. This approach is crucial to meet the escalating demands, potentially leaving small-scale data centres and individual sites at a disadvantage in the long run.

Computing power and cooling: The rise in computing power density, especially driven by AI applications, poses challenges in terms of energy efficiency and sustainability. Data centres must be designed to handle the significant heat generated by the server computer density required for AI. This involves ensuring adequate power provisioning and implementing efficient cooling mechanisms.

Speed of build: The demand for data centres is outpacing supply, making the speed of construction a key factor in meeting these demands efficiently.

Continual innovations: Staying ahead of the curve requires continuous innovations to achieve optimal availability and Power Usage Effectiveness (PUE). Businesses are placing a strong emphasis on energy-efficient designs to reduce operational costs and environmental impact. The adoption of innovative

cooling technologies is particularly sought after to ensure optimal energy utilisation.

High-rise data centres: In metropolitan areas like Mumbai and Chennai, the ability to construct high-rise data centres becomes crucial to optimise limited space.

Customisation and flexibility: Adaptable data centres with customised designs are essential to cater to diverse customer requirements effectively.

Vertical integration: Integrating design, construction, and operations capabilities vertically streamlines the overall process and enhances efficiency.

End-to-end solutions: Data centres must go beyond basic infrastructure and offer comprehensive solutions, including managed services, cloud support services, internet connectivity, fibre connectivity, and more to meet the evolving needs of clients.

The rise of edge computing has also led to a demand for smaller, distributed data centres that can process and analyse data closer to the source. These facilities need to be designed for efficiency and compactness and are needed in all major cities of India in the next 3-5 years.

AI and machine learning also have the potential to enhance data centre performance and facilitate operation-based technologies such as liquid cooling, exhaustive power capacity planning, infrastructure enhancement, backup mechanisms, power distribution efficiency fine-tuning, and integration of renewable energy sources.

In conclusion, the evolution of data centres is intricately linked to the rapid advancement of technology. As we stand on the brink of 2024, data centres are not only becoming more sophisticated in managing massive amounts of data but are also embracing green technologies to ensure sustainability and efficiency in an ever-connected world. 🌱

The author is the President of Data Centre Operations at CtrlS Datacentres. feedbackvnd@cybermedia.co.in



Getting ready to read the mind

Although nascent, industry reports point to a rising confluence of technology entering the fray of brain-computer interface in the country



BY VERNIKA AWAL

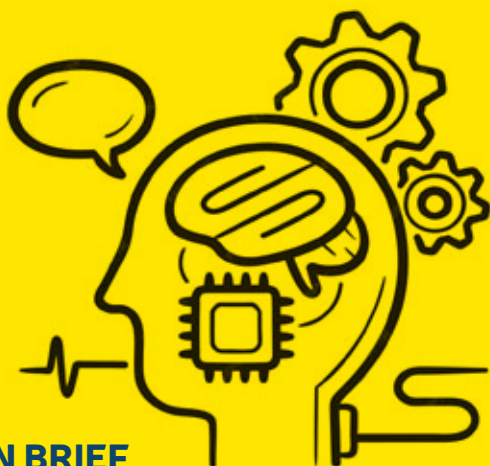
In September this year, Neuralink, the private brain research startup backed by Elon Musk, announced that it is accepting applications for human clinical trials of its brain interface technology. Put simply, Neuralink's technology uses a chip implanted into a person's brain to then scan the brain for signs of deep neural anomalies, and drive small-quantum electrical impulses through areas of the brain as required. Through scanning via electrodes placed on a person's head, Artificial Intelligence, AI algorithms that have studied brains for hundreds of hours will offer suggestions on how and where these impulses are to be driven.

While all of this sounds like science fiction, work on brain-computer interfaces has escalated in India, too.

Media reports highlighted a few Indian entities that are working on this nascent tech sector, thereby bringing niche, core sophisticated tech offerings closer to reality than where they stand today.

WHAT DO BRAIN COMPUTERS DO?

There are multiple ways in which brain-computer interfaces (BCI) work. The fundamental principle behind brain computing is to use sensors and electrodes to capture neural impulses in the brain, in a bid to understand the signals that are given by the brain to control human activities. The fundamental objective behind brain computing is to see if brain impulses can be captured and transmitted externally, or even be augmented in any way.



IN BRIEF

- BCIs use sensors and electrodes to capture neural impulses, aiming to understand brain signals controlling human activities.
- Companies in India are focusing on BCI to deal with mental health and disabilities and augment brain activity after accidents.
- AI play a pivotal role in developing accurate replicas of human brains, aiding in diagnosing anomalies and ailments, while contributing to brain mapping.
- Bengaluru-based BrainSight AI is developing ultra-high resolution brain maps, showcasing the private sector's active involvement in brain-based AI research.
- AIIMS is collaborating with C-DAC in a pilot project, reflecting the government's interest in exploring BCI and their potential applications in healthcare.

By augmenting brain impulses, scientists hope to see if any brain anomalies, caused naturally or due to any accident, can be healed. The over-simplified principle behind this lies in that brain damage and ailments occur when impulses from one part of the brain, that controls a certain bodily function, cannot reach another part that may control limb movements, speech or other actions. If this damage can be augmented by filling up the neural signal gaps, those who have suffered from paralysis or any other brain-linked issues may get their movements back.

Brain-computer interfaces, in this regard, use electrodes to capture these signals and transmit them

to a computer interface that translates the signals into actionable insights and tasks. Certain instances of BCIs have also offered an interface where thoughts are translated into words through such an interface, thereby offering those with speech impairments a way to express themselves.

WHERE DOES INDIA STAND?

India's brain-computer offerings, at present, are experimenting with ways to handle mental health issues such as bipolar disorder and schizophrenia, as well as aid those with mental disabilities. One key organisation that is working on BCIs in India is the Centre for Development of Advanced Computing (C-DAC), which is developing a brain impulse to capture impulses and record them on a computer interface.

By doing so, research work is being undertaken on how such impulses may augment brain activity in case of accidents and ailments. According to reports, All India Institute of Medical Sciences (AIIMS) along with C-DAC is working on a pilot project that is currently being tested.

On the private front too, there is brain-based AI research work that is being undertaken. Bengaluru-headquartered startup, BrainSight AI, is developing ultra-high resolution brain maps to study differences in various brain constituencies. By doing so, the startup is developing what it calls 'connectomics' that works as neural bridges to fill the gap between two nerve endings within a brain.

At the heart of both these projects is AI. By using AI algorithms to study brains, stakeholders of the BCI industry are steadily developing more accurate and convincing replicas of various human brains. This increasing accuracy is helping algorithms understand differences between each brain, thereby being able to potentially diagnose anomalies and ailments faster.

Pilot projects on the use of AI to augment mental health treatments are becoming increasingly commonplace, too. The National Institute of Mental Health and Neurosciences (NIMHANS), a government-backed mental health, psychiatry and brain research institute, is partnering with BrainSight AI to experiment with the AI-based brain mapping technology at the moment. As development on this forefront proceeds further, digital twin providers such as Dassault Systemes are also likely to consider brain mapping and BCIs with increasing dexterity. 🧠

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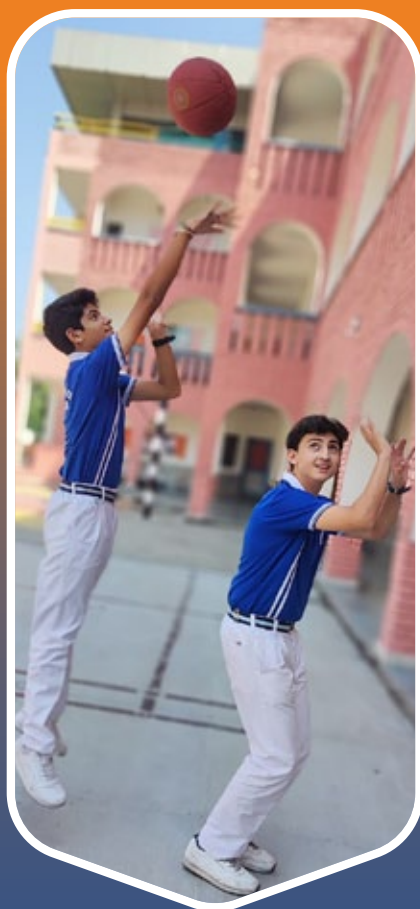


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All of a sudden an instant messaging platform has made a massive transformational impact on the Economy — from startups, to small and medium businesses and from healthcare to social entrepreneurship in our country — this is a Voice&Data exclusive.



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ISSUE**

Telecom Trends for 2023



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**GAJENDRA
UPADHYAY**

[OPENING NOTE]

2022 IS A WATERSHED YEAR FOR TELECOM POLICY AND REFORMS

The year 2022, will be a watershed year for India's Telecom from the Policy perspective.

For one, it marked a full year of reforms in the sector (kickstarted by our Hon. Minister for Communications Shri Ashwini Vaishnaw). These reforms have had a catalytic impact on the decades old processes and systems that were being followed.

Be it the enormous decision to redefine adjusted gross revenue (AGR) that eased the financial burden on operators, or streamlining of the licensing process by moving them all online to the saral sanchar portal (<https://saralsanchar.gov.in>) for applications, registrations, renewals and payments of fees, the cumulative impact has been extremely positive.

Some of the reforms are not visible to the daily users, but it has had a compounding impact on operations. Many of the processes for applying for licenses and spectrum were managed manually earlier. This involved a lot of paperwork, long waits, endless follow ups, poor visibility on the next steps and required dedicated resources to keep track.

By moving them online the Government has made all of these more transparent, eased the tracking of applications and their status and freed up precious resources for telecom operators. This is a saving and also enabled them to focus on more important work.

Voice&Data covered this in detail in our September 2022 cover story (<https://bit.ly/3GbWCQ>).

The year also saw some landmark new draft legislations and bills that will have a very long term impact. Most of our Telecom laws and rules are over a hundred years old. For example, the Telegraph Act dates back to 1885 and the Wireless Act is from 1933. There have been incremental additions and changes but broadly the framework and terminology has remained archaic.

The Draft Telecommunications Bill 2022 aims to reform this and put in place a completely new framework, covering the latest in technology, platforms, applications and services — including the licensing requirements for delivery of services over high speed wireless networks like 5G and beyond.

This has opened up a debate from competing sections in the sector on what can or cannot be included under the licensing framework. For example, telecom networks, mobile services and Internet Service Providers (ISPs) have been subject to licensing norms for long. Certain fixed financial and compliance requirements are part of their licenses.

On the other hand, streaming of content over networks, be it movies, sportscasts or web series over the Internet or even services like instant messaging and chat on the Internet (which offer voice and video communications to be shared between parties) have remained outside any licensing requirements.

The new Bill aims to bring all of these services (referred to as over the top or OTT) under some kind of a regulatory and licensing regime. This has obviously opened up a big debate between the incumbent operators who believe that OTT services are impacting their revenues by providing similar kinds of services (entertainment being a ration d'être of data consumption by users).

On the other had the OTT platforms like Meta, Netflix, Amazon and WhatsApp are of a different view. They believe these services are not of the same type or technology. They contend that the technology stack in use is not the same as that for network services and therefore the regulatory norms for OTT should not be on the same lines.

In this issue we cover some of the exhaustive submissions on these very intense and important topics by the industry. The final outcome will shape the future of Telecommunications and mobile services in our country over the next decade.

Convergence, which has long been a topic of discussion, has all of a sudden dawned upon us, without many of us noticing it. Text, voice, video, data, audio and the Internet of Things (IOT) are all communications over the Internet — and connectivity on wireline, wireless and satellite brings these services to end devices seamlessly.

With 5G networks already in operation, we have now covered nearly 30 years since the first 2G mobile networks went live in 1994.

And the year 2022 — globally not just in India — will remain a watershed year for enabling some truly impactful capabilities for users of mobile phones.

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WHATSAPP IS TRANSFORMING INDIA'S ONLINE COMMERCE – POWERING SMALL & MEDIUM BUSINESSES (SMB), PROVIDING SCALE TO STARTUPS AND CREATING HUGE SOCIAL IMPACT



All of a sudden an instant messaging platform has transformed into something much larger with a massive transformational impact on the Economy – from startups, to small and medium businesses and from healthcare to social entrepreneurship in our country – this is a Voice&Data exclusive.

BY GAJENDRA UPADHYAY

Most Indians would be familiar with “Boondi ka laddoo” – a sweet delicacy that is a popular snack – but few would know of Boondi as an artificial intelligence (AI) driven Chatbot running on WhatsApp Business Messenger that helped leapfrog the Bombay Sweet Shop – which is the new age “mithai” shop offering unique, designer and gourmet twists to Indian sweets / mithai.

Developed by Haptik – a startup that was acquired by Reliance Jio Platforms – the Boondi chatbot was Bombay Sweet Shop’s first point of contact for all its customer communications. Boondi handled queries, answered questions on its products, shared order delivery details with customers (who asked for it), and even directed customers to the sweet shop’s website.

Boondi was the first contact for customers to the brand over WhatsApp. It created a great experience for customers.

“Over the last year and a half Boondi has helped us close 40% of queries that come in,” says Yash Bhanage, Co-Founder of Bombay Sweet House - a twist on the traditional Indian sweet shop. “Bombay Sweet shop is

our re-imagined Indian sweet store where we take your traditional Indian sweets and recreate them in our own Willy Wonka way,” he says.

House of Mangalam is a popular brand that sells camphor-based products for the traditional Indian pooja. It also sells a range of other products like air fresheners. In March 2021 the group decided to use the direct to consumer (D2C) route by taking orders on its website. It started off well, but ran into communications challenges when customers were not able to instantly resolve doubts or raise queries. WhatsApp for Business – apart from the potential reach of almost 500 million users allowed House of Mangalam to engage with its customers in real time. It was able to inform them of their order status, brought back nearly lost customers who had abandoned their shopping cart, sent out promotional campaigns, offered discount coupons and shared their catalogues.

These are not just a few stray cases of startups or existing brands leveraging India’s most well known and preferred instant messaging (IM) platform, WhatsApp. The country’s largest and most well known corporate house, Reliance Industries has seen its value.



“We are not a Super App like WeChat. We are evolving like a Tech platform, where businesses can build in their experiences and embed unique features as they want.”

— Ravi Garg, Director Business Messaging India, WhatsApp @Meta

In November 2021, Mark Zuckerberg made an announcement on his official Facebook page calling it “the first ever end-to-end shopping experience on

WhatsApp.” This marked the launch of JioMart on the WhatsApp Business Messaging platform – which has gone on to create a paradigm change in the way Indian small businesses are launching, expanding, reaching out to customers and creating new business opportunities online. E-commerce aided by WhatsApp has helped them multiply their revenues and increase visibility.

Haptik WhatsApp business



Haptik is a WhatsApp business solution provider (there over 20 such partners that WhatsApp works closely with). “Haptik started early in this space,” says Aakrit Vaish, Founder speaking to V&D.

The sheer momentum and size of the opportunity that Haptik was addressing appealed to the Jio Platforms team. “Haptik has specialised in creating chat bots on WhatsApp – that help enterprises achieve their customer interactions in an automated and seamless fashion,” Aakrit explains.

Jio Platforms picked up an 87% stake in Haptik as it fit into its enterprise offerings and business expansion plans.

Haptik has created a separate entity called Interakt focused only on small businesses. In the process, it has helped countless small startups scale up – one of the most spectacular ones being Bombay Sweet Shop.

JioMart itself is a great example. Notwithstanding the massive reach of the parent Jio and its network or the gigantic financial might of the Reliance Group, JioMart found WhatsApp to be an ideal enabler for scaling its direct to consumer business. Meta announced the details of this on its website:

“JioMart on WhatsApp will enable people in India, including those who have never shopped online before, to seamlessly browse through JioMart’s entire grocery catalog. Shoppers can add items to their cart and make a payment to complete the purchase – all without leaving the WhatsApp chat.”

JioMart leveraged the enormous reach of WhatsApp to create a simple and convenient way for online shopping. It helped them reach out to tens of millions of potential customers almost instantly on a customized chatbot built

How JIO HAPTİK helped Bombay Sweet Shop scale up



interakt

x



Case Study

The impact of using Interakt for WhatsApp marketing

100 Orders placed in a single day

1.56L Revenue generated in a day

40% of customer queries are handled by Boondi, the bot.

4X increase in revenue since onboarding with Interakt

The Conversational Commerce Journey



by the Jio Platform owned Haptik. Haptik had spotted the WhatsApp Business messaging trend early and started building applications on the WhatsApp APIs. It customized chat solutions for small businesses that made it easy for users to discover products on JioMart, add them to their shopping carts and pay for them in just a few clicks.

JioMart has seen a 68% repeat purchase rate ever since it started using the WhatsApp channel. This is much higher than its online stores. In October of 2022, the WhatsApp bot clocked 2 lakh orders for JioMart. On an average JioMart today is fulfilling 1500+ daily orders. There is a 15% conversion rate of users / potential customers that access the bot and end up buying products from its store. This conversion is much above industry averages of below 5% on most other channels.

Customers are happy too. They can confirm delivery information and pay — using a number of options, including the WhatsApp payment gateway itself. Or any of the other payment options which Haptik has integrated with its chatbot.

“Payment is just one of the enablers on the platform,” says Ravi Garg, Director Business Messaging India, WhatsApp @Meta. In an exclusive chat with Voice&Data he shared some interesting highlights on the explosion of business use cases and some of the key drivers of WhatsApp for Business. “Payment platforms including

UPI is a long term strategy and investment, as it is a part of every business process,” he told us.

In fact, payment was one of the key factors that allowed HeyHomie, a Gurgaon based Startup that helps home entrepreneurs find new ways to sell, to launch its platform quickly. “We are amongst the first few platforms to offer a native WhatsApp Pay (UPI) feature to our customers,” says Anuj Mehta, founder of Hey Homie.

“Customers of HeyHomie (who are mostly home entrepreneurs selling through the platform) can now have the ease of collecting payments (from their respective customers) within the WhatsApp itself, without moving their customers to an external browser.” This is a huge value in not allowing customers to abandon a transaction. “For all Non UPI Payments, we’re using other payment gateways,” he explained.

WhatsApp has an estimated 490 million users in India today. It is the IM platform’s largest user base in the world. And this is a hidden goldmine as it allows enormous reach. Globally too WhatsApp (with nearly 2 billion+ users) is the largest instant messaging platform followed by China’s WeChat (owned by Tencent) with approximately 1.3+billion users.

WeChat is similar to WhatsApp in many ways as they offer text messaging, voice messaging, sending multimedia files, online payments, and a host of add on

WhatsApp took less than 13 years from its origin in 2009, to reach 2 billion users globally – with 25% of them in India alone.

Quick Stats on WhatsApp user growth

2010	10 million
2012	100 million
2016	1 billion
2017	1.5 billion
2021	2 billion

services like booking a taxi, online stores and merchants and much more. But it caters mostly to the China market.

The WhatsApp Business Messaging solution aims to be a little different in approach. “We are not a Super App like WeChat,” says Ravi. “We are evolving like a Tech platform, where businesses can build in their experiences and embed unique features as they want,” he explains. Slowly the platform is transforming into a simple to use technology of choice for businesses. Ravi expands on how this is happening. “At WhatsApp, we are committed to being India’s digital ally in its transformational journey of becoming a digitally inclusive society. People start their day and end their day on the WhatsApp platform. While most use WhatsApp’s end-to-end encrypted messaging service to stay connected securely to friends and family, they have now discovered the great value of using the channel to connect to businesses and access products and services on WhatsApp,” he says.

Momentum has built up slowly over the last one year creating a snowball effect more recently. More and more small and medium enterprises (SME), startups and even established brick and mortar businesses are turning to WhatsApp – leveraging its easy interface to connect to their customers.

In a survey this year, over 70% of Indian online adults said they preferred messaging over email or calls. (Source : Kantar online survey commissioned by Meta - April 2022).

Customers do not like to keep “waiting for a customer executive” when they need to talk about a product or

Meta commissioned Kantar survey results - April 2022

- 86% of online adults in India message with a business at least once a week
- 83% of online adults surveyed in India agree that messaging is a quick and easy way to communicate with a business
- 70% of online adults say they would prefer to make a purchase via messaging than going to a store

service. Such calls have created plenty of dissonance; the customer wants an instant response. That option is now available with businesses responding instantly on WhatsApp.

WhatsApp Business Messaging has tapped into this big opportunity. Helping improve responsiveness of small businesses, entrepreneurs and established brands. Their customer service responses have improved significantly due to the “instant” nature of the platform. And this has also created a whole new ancillary industry – of WhatsApp developers and partners who build customised solutions. Haptik falls into this category.

Haptik picked up the signs of businesses moving to WhatsApp at an early stage and specialised in creating chat bots on WhatsApp. The objective was to help enterprises achieve better response times to their customer interactions. It was automated and seamless.

Jio Platforms saw the value in this and picked up an 87% stake in Haptik. The framework was a perfect fit for Jio’s own enterprise and SME offerings – on its high speed 4G and 5G data networks. Enabling digital businesses (be it finance, trade or health) is one of the fundamental building blocks of Jio’s future.

WhatsApp is making this possible. “We see WhatsApp as the future of how people and businesses will communicate and get business done,” says Ravi. With decades of experience in the IT, Telecom and Value Added Services (VAS) space behind him, Ravi has seen the snowball effect before. The mobile telephony revolution had a slow start in the early 2000s – with 2G and some 3G data networks. But it rapidly scaled into a billion users in the next decade as mobile data became cheaper and network effects set in offering enhanced value to users.



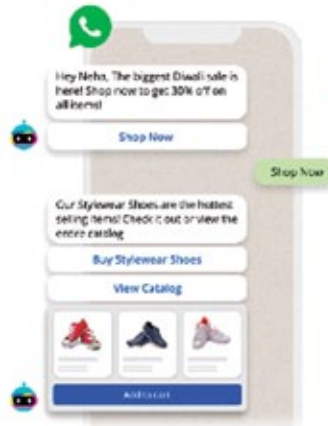
3 Pillars of Conversational Commerce



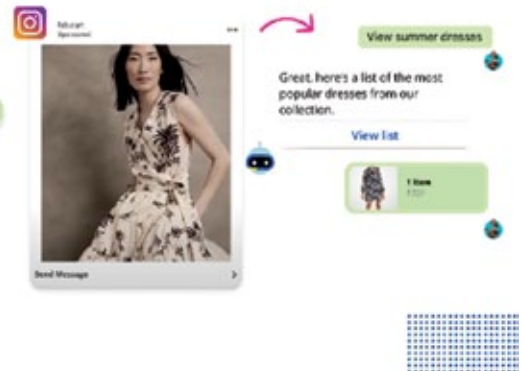
Commerce Chatbot



Proactive Messaging



Click to WhatsApp



Applications like WhatsApp which fall in the category of Over the Top (OTT) solutions have helped accelerate the momentum. Ravi's experience with Microsoft in building up the SME and Cloud businesses and driving the adoption of mobile gaming during his earlier stint at Nazara Technologies, gives him a very deep understanding of the Indian digital eco-system. This will be a huge benefit for WhatsApp to scale its Business Messaging solutions. Understanding consumer behaviour for adoption of new applications and technology by Indian consumers holds the key.

WhatsApp Business Messaging is proving to be a game changer and transformative for online commerce. Being able to engage with millions of other WhatsApp users, starting rich conversations at scale and delighting customers with a seamless experience are all factors that are contributing to its adoption.

Retailers, airlines, banks, fishermen, hardware traders, architects, tailors, self-help and women empowerment groups and dozens of others have already made a switch. They are seeing gains like happier customers, more efficiency from their customer service agents and improvements in marketing and sales. Unlocking new and faster ways to engage with their customers to close the cycle has become easier.

For example, proactively sending a boarding pass or sending a reminder to a customer or informing them that their requested item is back in stock, sending instant

information on flash sales, deals, new launches, catalogues or menus are all easier, faster and easy to implement.

For the user, it is a no-brainer. The WhatsApp's user interface, its multilingual support of nearly 12 Indian languages, the trust and reliability of the platform (as familiarity has created) has made this a democratized digital access.

"Its security and simplicity takes away user-inhibition towards technology for 'new-to-digital' users and is making WhatsApp the first digital gateway for millions of users," Ravi says.

HOW TO SET UP THE WHATSAPP BUSINESS ACCOUNT

Download the WhatsApp Business App from the Google Play Store or the App Store (Apple device) for free. Create an account on it to get started.

The WhatsApp Business App is ideal for a small business. However, for a growing SMB looking to expand its operations, the advanced version of WhatsApp Business called the WhatsApp Business API is a preferred solution.

KEY DIFFERENCE

The WhatsApp Business App supports only one user whereas the WhatsApp Business API enables multiple users to log in from different devices and work together seamlessly.

The Revenue Opportunity for WhatsApp in Business Messaging

The first 1,000 conversations each month are free so businesses can start to build experiences their customers will find valuable before they begin to pay.

Thereafter there are charges for conversational messages. These are classified under User Generated and Business Generated conversations.

User-initiated: A conversation that initiates in response to a user message. Whenever a business replies to a user within the 24 hour customer service window, that message will be associated with a user-initiated conversation. Businesses can send free-form messages within this 24 hour customer service window.

Business-initiated: A conversation that initiates from a business sending a user a message outside the 24 hour customer service window. Messages that initiate a business-initiated conversation will require a message template.

Both these conversations are for a 24 hours window. The user generated conversation is charged at Rs 0.30 / conversation and the business generated message is at Rs 0.50 per conversation for a duration of 24 hours. If a new conversation thread is started after 24 hours, then the charges are repeated.

According to some approximations of those who have used the WhatsApp APIs to reach out to their prospective customers, it takes an average of about 3 conversations to make a sale. So an average customer would consume 3 conversations (over a few days). This means there is a cost of about Rs 1.20 that is incurred towards engaging a customer on WhatsApp to close a sale — this is immensely valuable and economical. This cost considers an average of 40p / conversation into account. A combination average between user and business generated conversation.

Theoretically — with 15 million small business users in India, if even 30% of them generate 1 conversation a day (lasting over 24 hours) that translates to approximately Rs 45 Lakhs in daily revenues. The maths quickly adds up as the number of users and conversations go up. If the user base is 50% and they generate 1 conversation a day — that is Rs 75 lakhs daily. There could be instances of a user generating more than 1 conversation with different businesses in a day.

What does it cost an average retail business (like Bombay Sweet Shop) to acquire a customer.

Cost of Acquisition differs across categories but typically retail customers cost upto Rs 400 in acquisition. And the average basket value of purchase is between Rs. 1100 - 1300.

Jio Haptik, has seen a 15% conversion metric for customers like JioMart. This means for every 100 customers, 15 of them end up placing an order.

Financial Services is another success story. In the case of Upstox Haptik has onboarded 220K users against 3.5 Million Conversations.

Thus, WhatsApp has a clear monetisation value path and a revenue driver. There are many other possible avenues like running ads/banners or cross references that could further multiply these commercials for WhatsApp.

WhatsApp Business App vs WhatsApp Business Platform

WhatsApp Business
A side-by-side comparison of the WhatsApp Business App and WhatsApp Business Platform

WhatsApp Business App

- Small businesses
- Business profile
- Catalogs
- Automated quick replies and away messages
- Chat labels
- Free to download and use

Download the WhatsApp Business App from the Google Play store or Apple App store

WhatsApp Business Platform (API)

- Medium-Large businesses, Developers
- Business profile
- Proactive notifications
- List messages
- Catalogs
- Businesses pay per conversation with customers

Businesses can sign up directly or work with one of our business solution providers

	WhatsApp Business App	WhatsApp Business Platform (API)
AUDIENCE	Small business owners like a bakery or hair salon.	- Medium and larger businesses like a bank or airline that need a more powerful solution to connect with their customers at scale. - Developers that want to build directly on top of WhatsApp to further customize their experience.
FEATURES	Business Profile to let customers know basic information about the business. Automated Features like quick replies and away messages to promptly and easily answer common questions and let customers know when the business is available. Labels to organize chats and categorize customer conversations. Commerce Features Businesses can create catalogs to showcase the goods and services they offer so people can easily find something they want to buy, add it to a cart and send their order.	Business Profile to let customers know basic information about the business. Proactive Notifications Business-initiated template messages to deliver important, timely updates that people opt in to receive – like a booking alert, delivery confirmation or back-in-stock alert. Productivity Features List messages present a menu of up to 10 options so customers don't need to type out a response. Reply buttons allow people to quickly make a selection from up to three options with just a quick tap. Commerce Features Businesses can showcase and share their products and services up to 30 items as a message directly within the chat.
COST	The WhatsApp Business app is free to download and free to use. Additional features like the API are part of a separate service.	Businesses are charged for the conversations they have with their customers.
HOW TO GET STARTED		Businesses can sign up directly or work with one of our business solution providers. Learn more on how to get started here.

For the Business API, there is need to partner with a WhatsApp Business API service provider – a list of which is available on the WhatsApp site.

WHATSAPP BUSINESS API

Lets businesses offer great customer service through personalized messages, templates, automated responses and bulk notifications.

- Gives a unified platform for sending important alerts and notifications to clients.
- Helps businesses form strong relationships with customers building trust and loyalty which is the holy grail.
- Allows management of large volumes of incoming messages
- Gives a better understanding of customer's needs and expectations by keeping a record of past conversations, purchases and other customer traits.

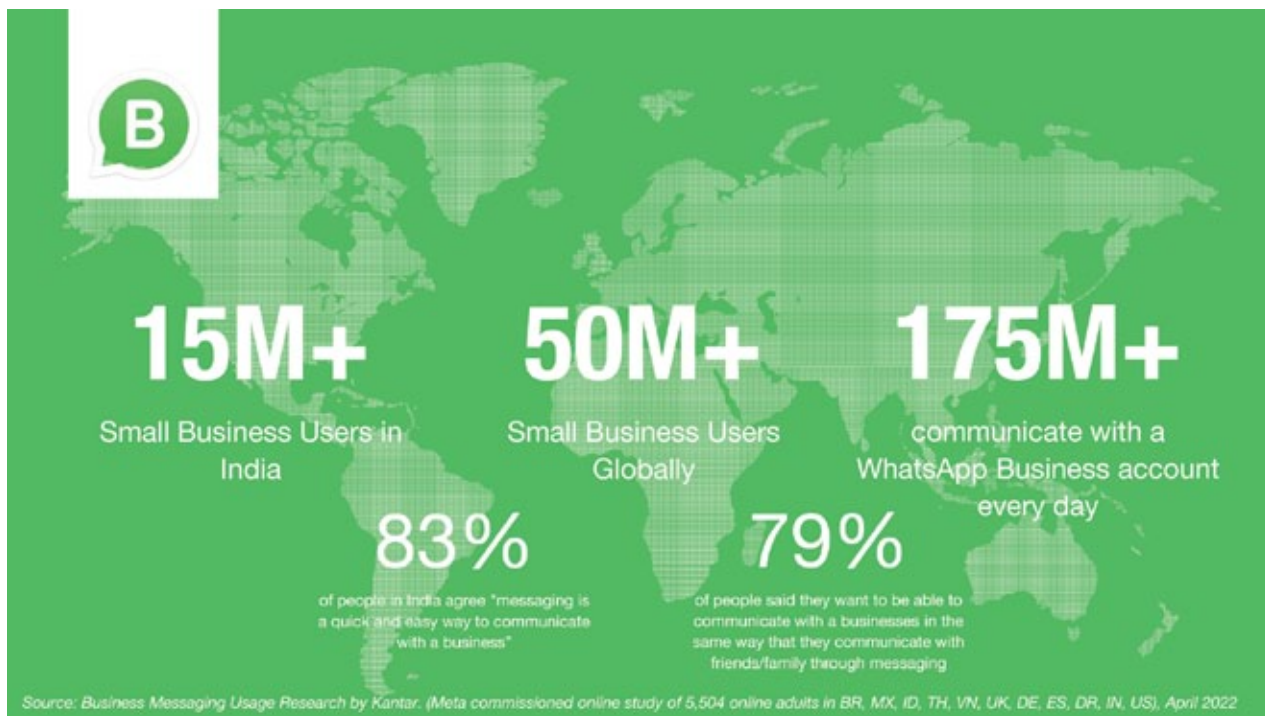
- Helps SMB reach out to customers, obtain direct feedback.
- Helps with responsive chat widgets which when implemented will allow customers to connect easily.

A WhatsApp Chat button can also be added to Facebook Ads and Posts to direct users to WhatsApp conversations.

BUSINESS OPPORTUNITY

"We think with 'business messaging' WhatsApp will play a significant role in the next phase of the country's digital transformation," Ravi says about its future growth possibilities. Messaging is possible across the spectrum of WhatsApp's business offerings (WhatsApp Business App, WhatsApp Business Platform (API), WhatsApp Cloud API). This is a big step in digitizing and empowering Small Businesses.

More than 15 million entrepreneurs in India rely on the WhatsApp Business App today. Which is the manual, free



to use app for small businesses that helps them connect with their customers and service them better. This reliance on WhatsApp is growing. For millions of businesses in India now WhatsApp is their main digital presence – it's their website, their store counter, their payment gateway

and marketing machine. Empowerment never got easier or quicker.

WhatsApp partnership with SEWA (self employed women's association) is an example of how this

The manual WhatsApp Business App is being leveraged by SMBs across the length and breadth of the country. A few examples

- **Jeevan Handicrafts:** Deepak from Nagaur, Rajasthan started Jeevan Handicrafts to empower women and to eliminate unemployment in his village by making traditional Indian dolls - kathputlis. During the first phase of lockdown, he started using the WhatsApp Business App allowing him to expand his business across India and effectively, making the business less dependent on tourism, wholesalers or retailers. The versatility of the platform allows brands to build immersive custom experiences that consumers find valuable, thus helping brands increase their engagement with customers.
- **Gullu's Kitchen:** Sagar, a foodie at heart, started Gullu's food outlet in August 2019, but his business nosedived during the lockdown. He then digitized his business using the WhatsApp Business App and that helped him double his sales.

The WhatsApp Business platform - WhatsApp's enterprise API solution on the other hand, is being leveraged by governments and organizations across sectors, in the country to scale digital and financial inclusion. WhatsApp's API offering is growing incredibly quickly with hundreds of thousands of businesses helping people with everything from customer support to ordering groceries to accessing educational materials to booking their COVID Vaccines.

The WhatsApp Business App is “Democratizing digital access in India” – enabling small businesses to build an online presence to connect with customers beyond physical/ geographic boundaries – thereby driving up sales, revenues and very often eliminating the need for small businesses to even build a website!

empowerment is working. SEWA wanted to enable and empower its women entrepreneurs at the grassroots level. During the pandemic WhatsApp enabled women farmers of Kashmir to connect with customers in Gujarat to sell thousands of kilos of apples and cherries creating an alternate ‘supply-chain’ on WhatsApp.

MannDeshi, another women empowerment non-profit body leveraged WhatsApp for a remarkable turnaround. Small enterprises that ran tailoring units for school uniforms were left with loads of fabric but no food on the table for their families during the pandemic! It was an extraordinary circumstance and an opportunity. They decided to use the fabric to make masks instead. This was a masterstroke, though unclear at the time. They created and circulated videos within their community members of the mask-making skill, using WhatsApp. Soon there were several, small groups of women, operating and coordinating the mask making activity within their villages. Together, these women made 10 lakh masks

within a few months and sold them in urban cities.

In Kerala too, fishermen have created communities (of their most prospective customers) to share details of fresh catch and pricing to book orders on the WhatsApp Business App, even before reaching the shores with the fish.

These are not isolated examples of innovation that a simple messaging technology platform has created. Lives and livelihoods are dependent on it.

WHATSAPP API EXAMPLES OF INNOVATIVE USE-CASES THAT REDEFINE CONSUMER CONVENIENCE IN THE COUNTRY, INCLUDE

- **JioMart – an India first initiative:** The First End-to-End shopping experience on WhatsApp with JioMart in India, wherein we enabled an end-to-end shopping experience with secure payment options, right within a WhatsApp chat thread.

JoMart

Commerce on WhatsApp

JioMart's WhatsApp Bot, created by Haptik, allows users to complete their grocery shopping on WhatsApp.

JioMart wanted to enable a simple and convenient way of online shopping for millions of Indian citizens.

JioMart's WhatsApp Chatbot makes it easy for users to discover the products they want and add them to their cart with only a few clicks. Users can confirm delivery information and pay using any payment method, all in just three clicks.

Mark Zuckerberg made the announcement on his official Facebook page calling it the “first-ever end-to-end shopping experience on WhatsApp”.

Since its launch in November 2021, JioMart has seen a 68% repeat purchase rate through the WhatsApp channel.

1500

Average Daily Orders

68%

Repeat Rate

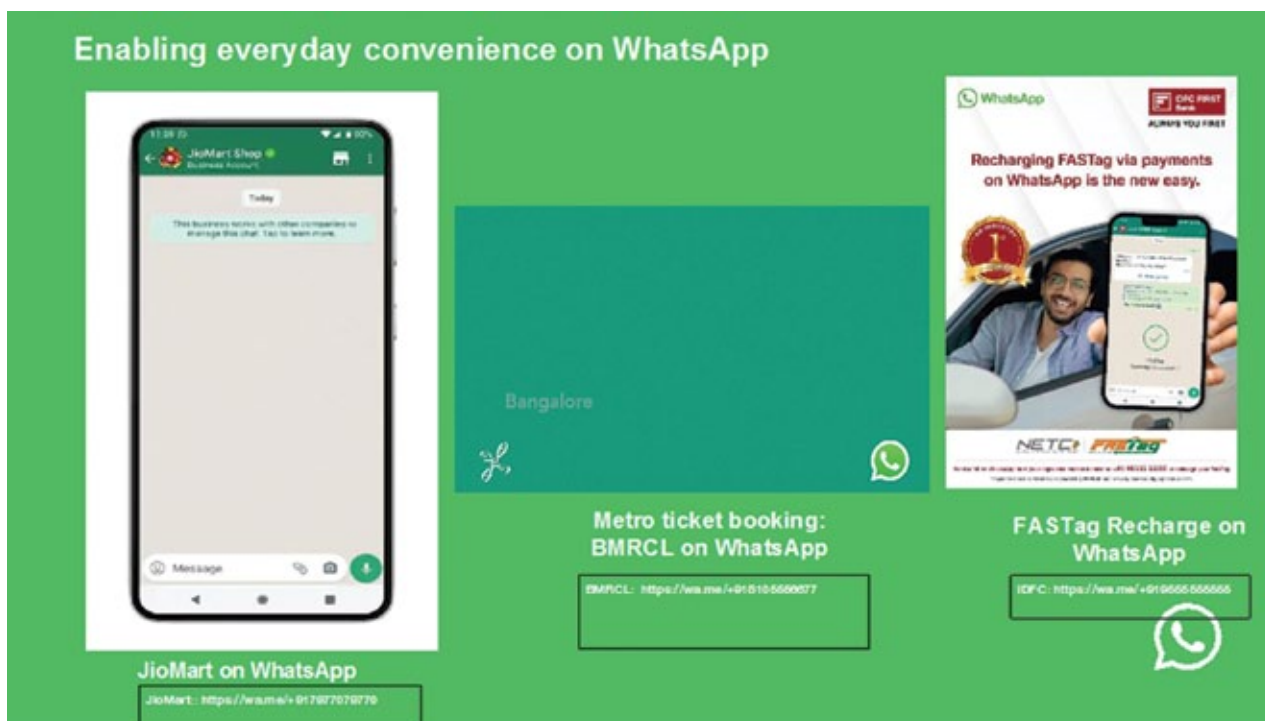
15%

Conversion Rate

★ In October alone, the WhatsApp bot clocked 2 Lakh Orders

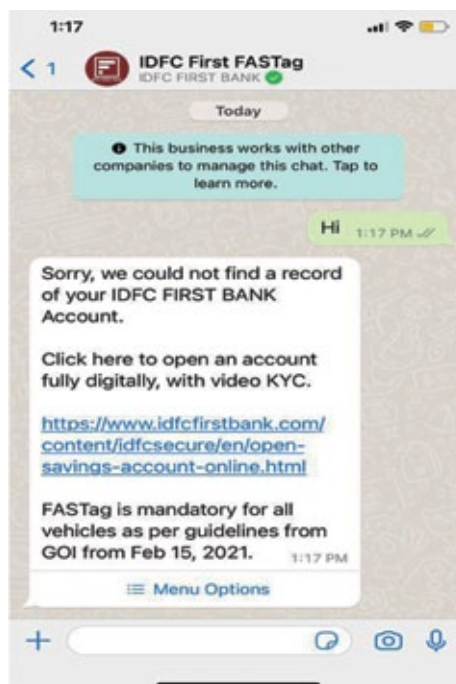
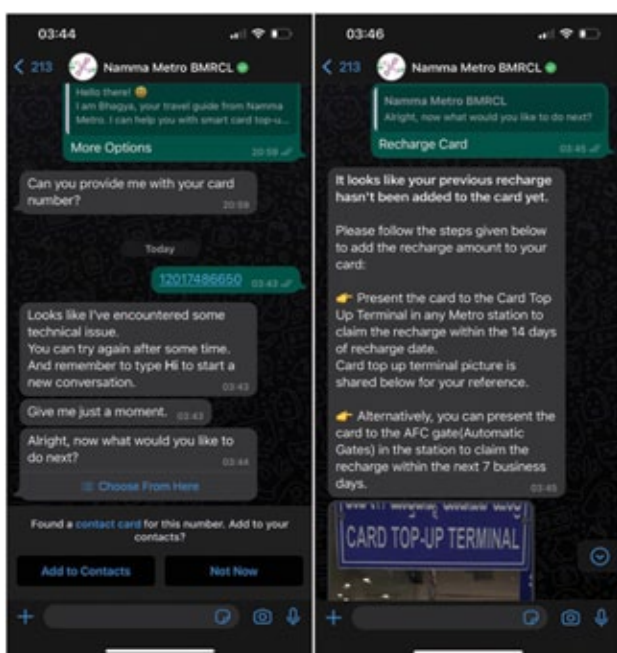
The screenshot shows a WhatsApp chat interface with the JioMart bot. The bot's name is 'JioMart' with a green verified badge. The message says: 'Hi, Michiel! Welcome to JioMart's quick shopping experience'. Below the message are two buttons: 'Start shopping' and 'Learn more'. A user has replied with a green bubble: 'I'm looking for Dairy Products'. The bot responds with a blue bubble: 'Sure, you can start browsing through these shortlisted dairy products'. Below this is a carousel of product images. At the bottom, there's a 'Welcome to JioMart 20 years' message and an 'Explore now' button. On the right side, there's a floating 'Add to cart' button.

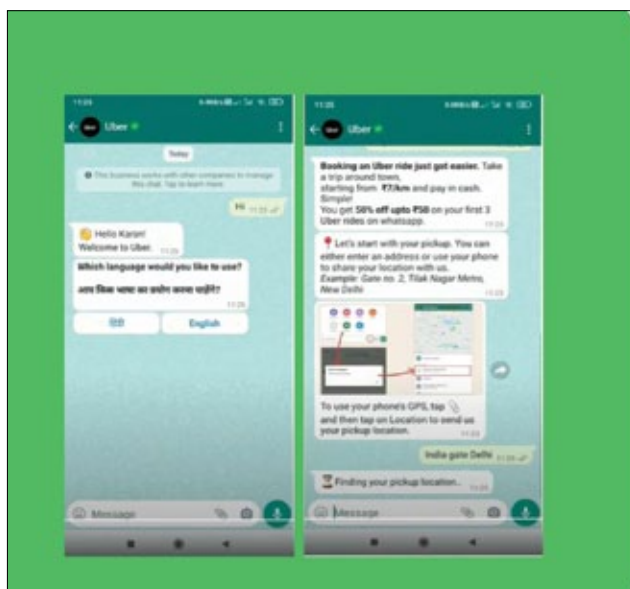
Isha Ambani, Executive Director of Reliance Retail Ventures



• **BMRCL's WhatsApp chatbot:** The first transit service globally to use WhatsApp for end to end QR ticketing. The chatbot is integrated with UPI powered payments on WhatsApp and will allow 0.5 million Namma Metro commuters to purchase tickets and recharge their metro travel pass right within the WhatsApp chat-thread ; sharing a news report that you may find insightful.

• **IDFC-FIRST Bank:** Has enabled the Bank's customers to recharge FASTags using payments on WhatsApp, an industry first initiative [FASTag is an electronic toll collection system in India]. The solution allows IDFC customers to recharge their FASTags right within IDFC FIRST's WhatsApp chatbot using payments on WhatsApp UPI.





WhatsApp to Ride: Uber & WhatsApp Expand Partnership to Delhi NCR

On August 3, 2022 Uber announced the launch and expansion of the WhatsApp to Ride (WA2R) product feature for users in Delhi NCR, one of Uber's top cities globally by volume. Through this integration, riders across Delhi NCR will be able to book an Uber ride via its official WhatsApp chatbot, one of India's most popular chat apps.

The WA2R feature was first launched in Lucknow, in December 2021. The expansion of this partnership to Delhi, marks a superior and more intuitive product experience as well as multilingual capabilities in English and Hindi for enhanced user experience. Built on the WhatsApp Business Platform, the partnership will expand access to Uber's mobility services to a new segment of consumers through integration in two languages.

Contact:

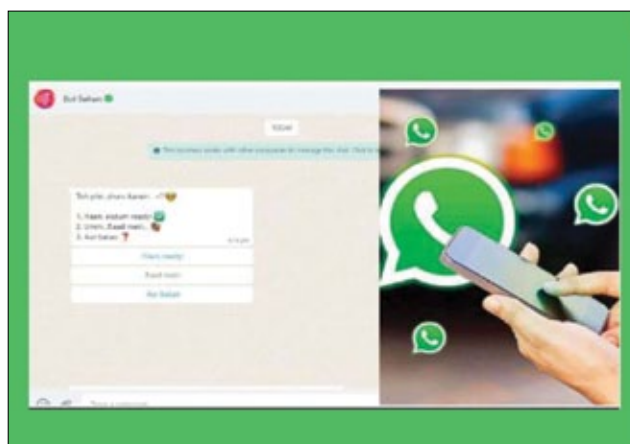
<https://wa.me/917292000002?text=Hi%20Uber>

WhatsApp user interface demonstration:

[WhatsApp User Interface Demonstration | Uber - YouTube](#)



- **Uber's 'WhatsApp To Ride' experience:** Uber launched a pilot of their WhatsApp to Ride (WA2R) service for users in Lucknow. The pilot revealed that the WA2R audience is younger than the average Uber App users ; 33% of the inbounds during this pilot were from new users, indicating a potential opportunity with WhatsApp to acquire new users. The success of the Lucknow pilot prompted Uber to expand the WA2R service in Delhi NCR, earlier this year
- **Urbanic:** Urbanic, an e-commerce women's fashion company sees a delivery rate of 98-99% for all of their real-time order notifications on WhatsApp. They now see a 70% response rate from customers, representing a 30% increase in positive customer engagement. These significant improvements to customer communication have reduced Urbanic's inbound customer inquiries by 30%, particularly in regard to shipping questions.
- **RedBus's train tracking through WhatsApp:** This solution eases the anxiety of train journeys for nearly 22 million passengers of intercity trains by helping them know their ticket confirmation status, time of arrival, or running status of their trains in real time.
- **SBI General Insurance:** SBI GI's WhatsApp chatbot enables easy access to insurance products through WhatsApp. It has made available health insurance and two-Wheeler Motor Insurance for customers to buy insurance in a simpler and secure manner, right within WhatsApp.
- **Girl Effect** is supporting adolescent girls to build agency around sexual and reproductive health through verified health services on their BolBehen WhatsApp chatbot ; during the pilot, 13,000+ users onboarded the bot; 1400+ girls accessed a health service for the first time through this WhatsApp chatbot.



Bol Behen

In March 2022, WhatsApp announced a new chatbot in India in collaboration with the non-profit organization called Girl Effect.

The AI-based chatbot, named "Bol Behen" will help adolescent girls and young women with concerns regarding their general health and sexual wellbeing. The Chatbot is available in both Hindi and English (Hinglish) and is designed to provide content on topics like relationships, sexuality, and reproductive health. The chatbot also allows users to ask their own questions on different topics. The "Bol Behen" (Speak, sister in English) chatbot can be accessed with a phone number or via an invite link on the web.

Contact:

<https://wa.me/730449661>



JioMart has seen a 68% repeat purchase rate ever since it started using the WhatsApp channel. This is much higher than its online stores. In October of 2022, the WhatsApp bot clocked 2 lakh orders for JioMart.

Customer Spotlight: Upstox

Upstox, India's largest investment platform, makes online investments easier with a WhatsApp Chatbot

Upstox, one of Asia's largest investment platforms, sought to build a WhatsApp chatbot to onboard new users and guide them in their investment journey.

Upstox partnered with Haptik to build an AI-powered WhatsApp chatbot that helps with onboarding new users and guiding them with personalized workflows. Upstox's 10M customers love using Haptik's Intelligent Virtual Assistant to learn about investment and get immediate support, and Upstox's increased CSAT of more than 50% is testament to that.

Additionally, Haptik's Proactive Messaging allowed Upstox to send WhatsApp notifications to users and achieve a 20% increase in the number of trades following the launch of Proactive Messaging!

220.5K Customers Onboarded in less than 6 months

20% Increase in number of trades

"Haptik has been pivotal in helping us explore the various engagement and sales opportunities that come with an AI-powered chatbot, firing up our sales pipeline and giving us a competitive advantage on our mission to drive exceptional customer experiences at scale."

Shrini Vivanath, Co-Founder, Upstox

- **Utilities:** IOCL and BPCL have built full-service WhatsApp chatbots that are making it easy for customers to message these businesses to make gas bookings, service reservations, and access other related services easily.

The WhatsApp's Business Platform has enabled governments at both the central and regional levels across India to deliver fast, efficient governance and create better citizen engagement – on a whole range of critical and timely services.

It has partnered with over 40 government entities (across state and central governments) to enable digital governance solutions that enable citizen engagements on issues like public health, social welfare and grievance redressal.

For example, the MyGov Helpdesk chatbot on WhatsApp is the go-to solution for millions in the country to access accurate information and public services.

The Common Services Centre chatbot provides end to end telehealth solutions on WhatsApp. The Mumbai Municipal Corporation's MyAssist BMC chatbot on WhatsApp offers 80+ citizen services to Mumbaiers.

Several innovative and impactful use-cases have emerged in India during the pandemic and also beyond – which were powered by the WhatsApp Business Platform.

Examples of the impact of MyGov WhatsApp chatbot:

MyGov use-case: In March 2020, when the pandemic crisis struck the world, the WhatsApp team helped set up the MyGov Corona Helpdesk chatbot. People could access authoritative and authentic Covid-19 related information. This helped in countering the massive confusion about this crisis.

In 2021, when the second wave of the pandemic struck, MyGov Helpdesk was expanded to include information about hospitals and availability of beds across the



The social impact of all these services is huge. “We strongly believe that WhatsApp can be a powerful tool for scaling this social impact and delivering solutions for a range of services like education, healthcare and skill development,” says Ravi Garg.

country, centers for Oxygen, food supplies, medicines and other support that helped people in emergency situations. Apart from being easy to navigate and use it helped citizens navigate through one of the most difficult times we have ever faced.

Steadily, the chatbot also expanded to include vaccination bookings and Covid-19 Vaccination certificates - downloads were easier through the chatbot.

Till date, over 85 million people have accessed the bot for Covid related response and relief alone information. 3 million Vaccination slots have been booked and over 40 million vaccine certificates have been downloaded. The MyGov Corona Helpdesk chatbot has been renamed - MyGov Helpdesk to include the Digilocker facility to help citizens access all their important documents like PAN, Aadhar, Driver's License, Board exam certificates, passports etc. at the touch of a button. WhatsApp being the underlying enabler.

The social impact of all these services is huge. “We strongly believe that WhatsApp can be a powerful tool for scaling this social impact and delivering solutions for a range of services like education, healthcare and skill development,” Ravi says touching on some of the newer areas where impact is imminent. “Over the years, we have continued to launch multiple use-cases across many sectors.”

Education and skill development:

- **ConveGenius** and some other ed-tech institutions are delivering education to students through WhatsApp based learning models.
- **DoubtNut** has created an App where students can send

the picture of your math questions and a WhatsApp bot provides you with the video solution of your queries.

- **WhatsApp** has tied up with the National Skill Development Corporation to help skill India's youth digitally via the WhatsApp platform. This will fill the need gap of upskilling and provide a huge learning opportunity for millions.

Financial Inclusion:

- WhatsApp announced a pilot program across Karnataka, Telangana and Maharashtra aiming to empower villagers with access to digital payments through 'payments on WhatsApp'. Hundreds of thousands of villagers have been onboarded to use digital payments across over 1200 locations. Additionally this has created an ecosystem of users and merchants on the ground who are now transacting digitally.
- WhatsApp's democratized access resolves friction and enables entities to provide essential services like micro-pensions, micro-insurance and micro-credit through the medium of WhatsApp to reach the underserved communities who deserve them the most
- Small finance banks like AU and Equitas that are focused on rural segments, farmers, and micro-industries are operating services through WhatsApp.
- People can now access and purchase health insurance from State Bank of India as well as micro-pensions from India's National Pension Scheme on WhatsApp.

Healthcare:

- **Tele-health consultation:** The government's Common Services Center (CSC) recently partnered with

WhatsApp vs Email: why messaging app beats email when it comes to customer service

Using of a messaging app for customer service instead of email is far more personal, immediate and convenient. While email too can be accessed on mobile, we're mostly using our smartphones to stay in touch with friends and family. That makes us more active on messaging apps like WhatsApp – studies have found that users spend almost 38 minutes on average on the chat app every day.

When your customer is so active on the platform, why not make use of it to offer more proactive customer service too? The convenience of checking the response as compared to having to sift through emails to find a reply, is obvious!

IT'S MORE PERSONAL

Emails are actively used for more 'professional' conversations. Long email chains and delayed access make them slow. Messaging apps like WhatsApp help in actively engaging with customer conversations. Customer service experiences become personalised.

ENGAGING

WhatsApp allows easy uploads of photos, videos, PDF files along with the usual text messages.

FASTER

Average response time for emails can range from a few hours to several days. WhatsApp offers almost immediate responses. The platform witnesses a 99% open rate.

Customer Spotlight: Zoop India

Zoop India, IRCTC's in-train delivery service, made it very easy for passengers of the Indian Railways to order food via an easy-to-use, self-serve WhatsApp chatbot!

Zoop India, a food delivery service, wanted to overcome the challenges of limited internet access and even more limited food options on train journeys!

Partnering with Haptik, Zoop India moved their primary channel of communication of all its partner restaurants & end users to WhatsApp, making restaurant food booking available on WhatsApp!

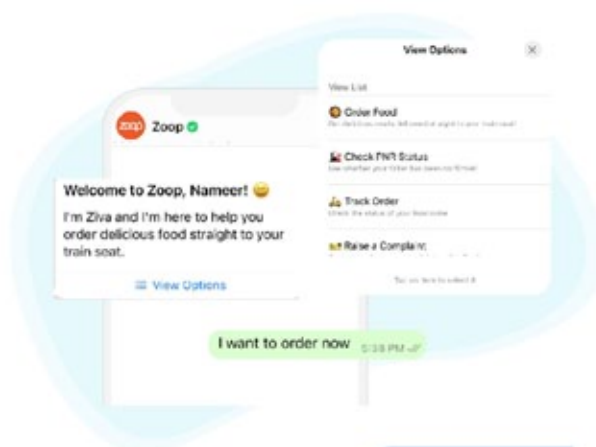
The WhatsApp chatbot enables users to use Zoop to seamlessly order food at any upcoming station as per their convenience without the hassles of downloading an additional app. It also provides quick and easy 3-click payment experience within WhatsApp to place instant orders with real-time tracking and support.

7000+

Average Month
Orders on WhatsApp

"The problem of lack of access to quality food in trains is something we wanted to resolve. Tens of millions of people travel on trains each day and Haptik, in partnership with Zoop, is helping passengers order their favorite meals and get delivery straight to their seats."

Puneet Sharma, Founder, Zoopindia.com



WhatsApp is playing a massive role in transforming health care supply and processes in the country.

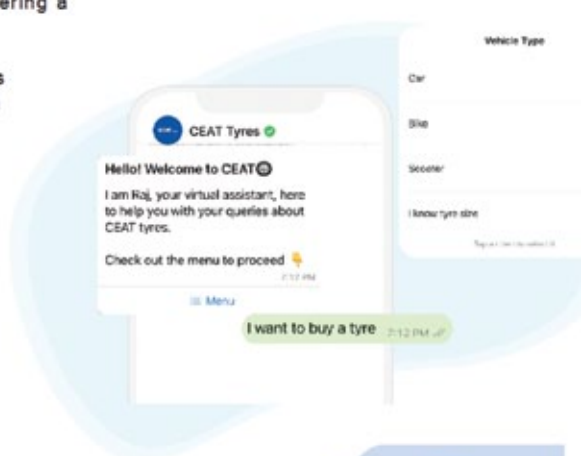
Customer Spotlight: CEAT

CEAT, a leading tyre manufacturer, is generating quality leads by offering a differentiated experience on WhatsApp.

CEAT sought to have effective and engaging conversations with its customers at scale. The bottomline was to collect high-quality leads, improve conversion rates, and expand its brand presence.

CEAT partnered with Haptik to build a WhatsApp chatbot that helps generate sales-qualified leads by interacting with customers, making product recommendations, and offering discounts - all at the right stages!

Since implementing the WhatsApp chatbot, CEAT has observed a 542% increase in leads. In fact, lead generation via the WhatsApp chatbot has proven to cost-effective when compared to other social acquisition channels.



542% Increase in leads through WhatsApp chatbot

28% Lead to conversion rate

70% lower cost per Lead than Social

"Our chatbot conversations and leads have grown since we implemented the WhatsApp chatbot. Automating the chatbot has reduced agent load thus reducing acquisition and manpower costs."

Vidur Anand, Head of eCommerce, CEAT



WhatsApp to launch a dedicated helpline called 'CSC Health Services Helpdesk'. This WhatsApp chatbot provides a digitally inclusive teleconsultation solution for people across rural and remote India. The helpdesk on WhatsApp makes it easy for people to seek support from administration, consult with doctors, access a wide range of resources and get their queries addressed.

- **Healthcare Incubator:** The WhatsApp Healthcare Incubator Program, is an initiative that will support organizations in building digital solutions, for a healthier future. The program aims to facilitate positive and measurable health outcomes at scale by leveraging the WhatsApp Business Platform.

Partnerships with civic bodies during the pandemic:

- **X-Ray Setu** - offers easier diagnosis of COVID-19 by uploading health data.
- **The CovidAshaBot** helped in providing Oxygen Supply.

- **Robinhood Army** used its deep network of volunteers to run its Senior Patrol campaign to remove vaccine hesitancy among senior citizens.

It is not an exaggeration to say that WhatsApp is playing a massive role in transforming health care supply and processes in the country. All of these services have built their offerings on WhatsApp Business Platform.

"Going forward, our goal is to invest in awareness and education for 'new-to-digital' users," Ravi told us. "While we know a portion of the digital-savvy, urban users will eventually choose the WhatsApp experience, there is a lot of upside to investing in awareness and adoption of rural and new-to-digital users. We will continue to simplify and scale "everyday" use cases that are meaningful to everyday users. Mass technology and societal transformation happens when the use cases move from novelty to necessity." 🍌

feedbackvnd@cybermedia.co.in



Anuj Mehta
Founder, HeyHomie

Anuj Mehta (founder HeyHomie) is one of the early entrepreneurs to leverage the business feature of WhatsApp as a platform including its payment solutions on UP and Payment Gateway

WHAT TRIGGERED THE THOUGHT OF USING WHATSAPP BUSINESS MESSAGING

WhatsApp is the most widely used chat applications by Indians. Interestingly, a good majority of businesses that are started or run from home (Homepreneurs) are using WhatsApp as their primary tool for lead generation and sales channel. Having said that, WhatsApp isn't offering any in-app ecommerce functionality for its users as a default functionality, and this leaves them to look out for other ecommerce tools available in the market which are either web or app based.

Interestingly, homepreneurs are not very comfortable with using web / app-based ecommerce tools because it requires them to hire a professional agency to manage these online stores and the expensive signup cost along with recurring charges to manage the stores on an ongoing basis is a deterrent for them.

Those who still manage to get their website are struggling to convert sales on their website as there is limited scope to manage native customer retargeting, build abandoned cart recoveries, create referral programs for their customers, build communities, lower their CAC (Customer Acquisition Cost) and likewise are some of the critical points which any homepreneur would require to grow their business, but unfortunately they can't do it today because either such features are way too expensive or they don't have an understanding of who to hire or how to execute the same. And all this may be available via a website/ app, but then at what cost and is it viable?

At HeyHomie we have worked towards addressing this void via our Social Commerce SaaS Platform that operates

“Heyhomie offers homepreneurs a full stack e-commerce platform on Whatsapp”

on WhatsApp & Instagram; ours is a full stack offering, i.e. from an E-commerce store till last mile delivery along with exhaustive customer life cycle management for building higher LTV and data sets to retarget them.

This means now any homepreneur can either start their entrepreneurial journey from the comfort of home or scale their existing home business by setting up their stores on WhatsApp & Instagram via HeyHomie's channel. We used the Official WhatsApp Business APIs to build this.

WHAT WAS THE BENEFIT YOU SAW BY USING WHATSAPP BUSINESS MESSAGING

Building our SaaS product around WhatsApp was an absolute no brainer for us. The reasons were quite simple

- The majority of our customers (sellers) and their respective customers (buyers) are on WhatsApp
- Moving them out of WhatsApp and building a journey on web/ app stores is a challenging task
- Coexisting within the WhatsApp ecosystem was the best bet as our sellers/customers and their respective buyers/customers don't have to change their behavior with respect to communicating with their buyers/ customers or even while accepting orders or shipping them. WhatsApp is the default app they use for all business or communication purposes
- We wanted to leverage the power of WhatsApp Groups, which inherently is the default go to market strategy for most homepreneurs
- WhatsApp is a true quick commerce experience and that's exactly what our sellers/ customers have been looking for. Leveraging on WhatsApp's ecosystem allows us to bypass the need to build UI/ UX efficiencies at our end.

HOW HAS THE RESPONSE FROM YOUR CUSTOMERS BEEN

Since our launch in Feb 2022, we have pivoted 3 times and these pivots happened because of the customer feedback we received. We have been very receptive to the feedback received from our beta users as it allowed us to understand what it takes for us to make them (our customers) successful.

We started as a Marketplace but with pivots in place, we're now a SaaS Company offering WhatsApp & Instagram QR Shops (Social Commerce) to Homepreneurs & select Brands.

WHO IS THE TYPICAL CUSTOMER FOR HEYHOMIE

Our key customers are Homepreneurs and they can be categorised in the following manner

- Creators Ecosystem
- HomeChefs
- Jewellery Sellers
- Clothing Sellers
- Packaged Products

HOW DID THE WHATSAPP UPI AND PAYMENT GATEWAY HELP YOU.

Yes, so we are amongst the first few platforms to offer native WhatsApp Pay (UPI) feature to our customers. In this way, our customers can now have the ease of collecting payments within WhatsApp itself, i.e. without moving their customers to an external browser. For all Non UPI Payments, we're using other payment gateways.

HOW HAVE YOU SEEN YOUR OWN GROWTH ON ACCOUNT OF THIS

At the launch, we witnessed a significant surge in seller registrations, and we were quite successful in onboarding our sellers, but as we pivoted, we had to make some hard decisions about moving our platform from public access to beta users access only.

The Beta Program actually helped us in making the product simple, efficient & blazing fast. We're still running our Beta Program and are expected to make the product open to the public by early Jan 2023 (via Waitlist Program). Under the beta program, we have a little over 500+ sellers who have either setup their stores on WhatsApp or Instagram.

We will soon launch the Waitlist Program for public users, where they can sign up and get the chance to setup their own stores on WhatsApp & Instagram for FREE!

Apart from this, we provide all our sellers with WhatsApp and Instagram QR Codes, Shop & Product URLs and extensive insight on how they use these stores with their existing Facebook, Instagram, WhatsApp, Youtube and other social accounts. We don't charge our customers for any conversational message pricing for WhatsApp, which is actually charged by Facebook to us. We only charge our sellers when they sell. Our pricing is built on the ideology of Pay As You Go. 🍷

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BHARAT B. BHATIA

Building the case for Direct to Mobile using 3GPP 5G Broadcast for India's Broadcast Digitization

New business models have to emerge between public broadcaster, TSPs and OTT players



India is now at the cusp of a broadcast digitization. With the Govt. of India also considering citizen centric services targeting mobile phones, the public broadcaster Doordarshan can now look to a new lease of life. With high level discussions now taking place within the Ministry of Information and Broadcasting (MIB) and its sister organizations including Prasar Bharati and Doordarshan, it is imperative that the policy makers make note of global developments on this front.

Doordarshan has, multiple times in the past, been making efforts to move up the technology path towards broadcasting modernization. However, the lengthy bureaucratic processes and possibly some bad commercial planning, such modernization and adoption of new technologies did not gain traction. This in fact caused substantive subscriber erosion and revenue losses over time. The latest shut down of its DVB (digital video broadcasting) services (which was supposed to digitize the use-cases) for lack of an ecosystem is a case in point.

Essential ingredients for a success story in broadcasting is to focus on the digital content delivery and of the development of a device ecosystem. This needs immediate attention of the decision makers in MIB, else their renewed efforts would lead to further loss to the exchequer and time, with the risk of consumers waiting for a world class broadcast service migrate into choosing other options. To avoid history repeating itself, MIB and Prasar Bharti need to undertake an end-to-end cost-benefit analysis of the entire planning, while ensuring that natural resources are utilized optimally for providing quality public services. Three unknowns need to be accounted for in this planning analysis: the

broadcast radio network that includes the core network, monetization of the spectrum resources and the end-user device ecosystem.

The broadcast network with technologies to reach mobile devices will be a transformative change for the public broadcaster (moving from analog to current generation digital), but probably the one with lowest priority in the whole migration. Digitization comes with its own baggage of challenges. The traditional model of employing High-Power High-Tower (HPHT) transmitters for roof top reception needs a review taking into account the Low-Power Low-Tower (LPLT) transmitters. Secondly, the broadcaster may need to seamlessly integrate into their 3GPP based cellular core network of TSPs for offering advance services including off-load, authentication, security, and session maintenance, etc.

The second unknown is the license to operate a broadcast service in the broadcast spectrum. New business models have to emerge between public broadcaster, TSPs and OTT players keeping in mind the needs of the Indian consumer. The public broadcaster has prior experience sharing spectrum to private players (FM licenses) and a similar licensing model should be explored for offering Broadcast services. This is going to be a win-win scenario for multiple players in the ecosystem.

The broadcaster will earn revenue by licensing spectrum and leasing airtime in the HPHT transmitters, the cellular operator and OTT players may use this model as an additional opportunity to reach new subscribers which is currently not addressed in the DTH or OTT models. For a cellular operator, this is also an efficient means to offload live OTT content. This model is very

The license to operate a broadcast service in the broadcast spectrum will have to take into account new business models that are emerging – keeping in mind the players which are now public broadcaster, TSPs and OTT.

elegant to scale in which the administration can leverage it to offer citizen centric services (e.g., schools, agriculture, public disaster broadcasting, etc.) by becoming or partnering with another DCO.

The third and final unknown (but the challenging of the three) is the ability to reach end-user devices. Ironically, this is often overlooked in the planning. India is complicated for several reasons, i) it is an open market i.e. an operator is not able to decide what functionality can get into a device, ii) it is a cost sensitive market i.e. competition forces OEMs to trim down on new functionalities to be added. The story of broadcasting digital content to mobile phones for India will likely succeed only when the technology is integrated into “open market” end-user devices without impacting the cost. And for that to happen India needs to focus and invest on globally harmonized standards and technology that has a high success of getting into mobile phones.

The 3GPP Long Term Evolution (LTE) Evolved Multimedia Broadcast/Multicast Service (eMBMS) has been built upon LTE with as minimal change as possible to the existing structure. 3GPP has specified LTE-based 5G broadcast (since Rel-16 and ongoing standardization in Rel-17) and NR MBS (ongoing standardization in Rel-17) with minimum additions, possibly limited to software updates. Both these 3GPP family of technologies aim to address audiovisual needs of citizens.

- LTE-based 5G broadcast address high-tower/high-power deployments, requiring specific band (470-694/698 MHz or parts thereof) and can also work in the existing channel bandwidths of 6, 7 and 8 MHz (Rel-17).
- NR MBS can be deployed, in existing 3GPP mobile bands and Rel-17 networks that would enable not only general MBS services but also transparent IPv4/IPv6 multicast delivery.

3GPP undertook this work as the enabler of the delivery of services over multicast and/or broadcast connections, resulting in overall cost minimization and easy adoption by operators. With 3GPP Rel 14, eMBMS has been extended with Enhanced TV (enTV) features

that enables TV broadcasters to deliver their services also over eMBMS.

These standards were first developed in the 3GPP through the active involvement of global broadcasters and then subsequently adopted into Indian national standards by the Telecom Engineering Center (TEC). Among the many enhancements to the system, highlights include greater radio broadcast range, free-to-air services, and transparent mode delivery of digital video signals.

These feature enhancements attracted global TV broadcasters to offer their services into mobile devices, to enable service continuity and greater coverage. Extended MBMS (xMB) interface is introduced between Broadcast/Multicast Service Center (BM-SC) and content provider. In transport-only mode delivery, content providers send application data to the 3GPP network, and the BM-SC simply forwards the data in a transparent fashion to the user device. In summary, the broadcasters now have a technology that reuses 3GPP silicon to offer broadcast content into mobile devices without increasing the bill of materials (BOM) for manufacturers and consumers, thereby capable of creating an ecosystem and allowing for its success.

Note: the author is a renowned ITU expert and together with IAFI is an advocate of globally harmonized technology adoption. With years of experience behind him, he can confidently advocate for technologies developed by the broadcasters in 3GPP and adopted by ITU into the M.2150 recommendation. The 3GPP ecosystem of vendors and devices OEM is rich enough for commoditizing the technology in a shorter time that would further allow the broadcasters from all the ITU nations to further leverage and adopt into respective national standards. Since India has already adopted these technologies into national standards, it also has a first mover advantage to create a local ecosystem using this technology. 🙌

Bharat Bhatia is the President of the ITU-APT Foundation of India (IAFI) and Vice Chairman of the World Wireless Research Forum (WWRF) for Asia Pacific Region. He has worked as a spectrum regulator in India and as the international head of spectrum team of Motorola solutions
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Comments on the Draft Indian Telecommunication Bill, 2022 ('the Draft Bill')

Broadband India Forum (BIF) – has shared a detailed set of comments on the proposed Draft Indian Telecommunications Bill. Extracts from the very exhaustive comments



EXTRACTS FROM BIF SUBMISSION

BIF has submitted that the current framework has many good features, like:

- Independent regulator in TRAI
- Expert Appellate Tribunal / adjudicator of disputes in TDSAT;
- Regulator's (TRAI) and licensor's (Central Government) functions clearly segregated
- Transparency due to public consultations for recommendations / regulations

Indian regulatory framework is an example of global best practice in telecommunication regulations. This has

resulted in the orderly growth of the sector (2nd largest and the fastest growing network in the world) and served interests of service providers and consumers and is the basis for huge investments (nearly Rs.10 lakh crores) and competition in the sector.

The existing edifice is built on Section 4 read with definition of 'Telegraph' in Indian Telegraph Act, 1885 ('ITA') and Section 11 of TRAI Act.

Under Section 4 of the ITA, the President of India has conferred exclusive privilege of establishing, maintaining,

There is a marked contrast between the legal framework provided in the Draft Indian Telecommunication Bill, 2022 (referred to as 'the Draft Bill' in this document) and the corresponding current framework for telecommunications.

and working telegraphs to Central Government (represented through DG-Telecoms and inter-alia Secretary, DoT), with proviso under which Secretary, DoT, under this exclusive privilege can grant licenses for these defined activities (i.e. establishing, maintaining, and working telegraphs) to the private licensees. The license under section 4 of ITA is for establishing, maintaining, and working telegraphs and the license can have other conditions, pertaining to these activities.

While we appreciate the need to modernise the framework, it should not negate the existing framework, which has enabled us to get to this enviable position, but build up on the same. We strongly recommend that the term 'Telegraph' in the existing ITA should be replaced in the Draft Bill with the term 'Telecommunication Network', to be consistent to the framework and to be in sync with changing telecommunication technology.

It must be understood and appreciated that the edifice is premised within the domain of 'telegraph' and 'telecommunication network', and therefore we cannot have a telecommunication service except from a telecommunication network. Conversely, a service which comes from a non-telecommunication network cannot be deemed to be telecommunication service under the Draft Bill / Act.

However, we see a completely different licensing framework in the Draft Bill. It is based on a complex and confusing structure of definitions of 'telecommunication', 'telecommunication services' and 'telecommunication network' and introduction of separate categories of licenses for 'telecommunication services' and 'telecommunication network'.

In the play of words in the definitions, 'telecommunication network' has been decoupled from 'telecommunication services' so that licenses can be given only for so called 'telecommunication services'. In our view, the definition of 'telecommunication services' is incorrect and misleading because 'telecommunication services' cannot be provided without 'telecommunication

network' and that part is missing in the definition of 'telecommunication services'.

In view of the above stated confusing play of the words, the result is that any service which is made available to the users from non-telecommunication networks or methods is deemed to be under the license purview in the Draft Bill. This leads to a grossly anomalous and impractical situation where many OTT and IT services get construed as telecommunication services and can be subjected to license, even when there is no establishment, maintaining or working of telecommunication network by them.

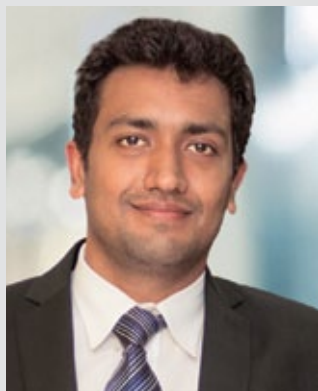
The Draft Bill, for example, includes OTT Communication Services, even though OTT Communication Service provider have no telecommunication network. However, this anomalous inclusion is in sync with the confusion and incorrect picture of licensing created in the Draft Bill.

Bringing the OTTs under the ambit of the telecommunication service license also implies that the Government only holds the exclusive privileges to decide, build, develop and operate the OTT Apps. Such a situation is grossly anomalous, highly impractical and will lead to a collapse of the entire app ecosystem and thereby impacting innovation and growth of the economy.

In the matter of OTTs, apart from the fundamental fact that they are not produced from a telecommunication network, there are many other strong and substantive reasons, which differentiate them sharply from telecommunications, which are given in section dealing with definition of telecommunication services.

Broadcasting service is another such example. It is included as an element in the definition of telecommunication services. Broadcasters need license for wireless telegraphy under the existing telecommunication laws. However, the aspects like respective service, its tariffs, quality, content regulation etc. are not part of the telecommunication license and all these aspects are governed by Ministry of Broadcasting / respective

The term 'Telegraph' in the existing ITA should be replaced in the Draft Bill with the term 'Telecommunication Network', to be consistent to the framework and to be in sync with changing telecommunication technology.



Ankit Agarwal
MD, STL

Right of Way rules have to be further simplified

India is on the journey of building digital infrastructure that will put us on a strong pitch for global leadership in technology, manufacturing and services. Policy frameworks have an important role to play. The proposed telecom bill 2022 aims at making these policy frameworks "future ready".

We need to think 10 years, 20 years ahead.. Today's Infrastructure requirements have surpassed the traditional needs of just towers, fiber, conduits, and ducts. We need to expand digital Infrastructure in a more holistic and all-encompassing manner. This is where the importance of street furniture will come into play. Millions of small cells will be required to be deployed using street furniture such as electricity poles, billboards, smart poles and traffic lights.

Additionally, in order to improve the optical fiber coverage in the country, aerial fiber will need to be deployed on street furniture for quickly providing reliable high-speed fiber backhaul to small and macro sites. For backhaul fiberisation, Right of Way rules will have to be further simplified in terms of procedure and charges for deployment or renting and sharing the street furniture.

Funding is, of course, a critical piece. The government should take a more 'expanded' view and form a "India Digital Infrastructure Fund" with a single mandate to create, manage, upgrade and monetise India's digital infrastructure. The fund should not depend only on government sources alone, but also include private sources including market borrowing (like tax-free bonds, etc.).

Lastly, there should be a separate fund for Technology and Innovation to catalyse R&D, skill development and intellectual property. India already has big strengths like talent and ability to master scale. In the coming decade, the combined power of technology and innovation will give us the edge.

guidelines. However, the Draft Bill, instead of confining Broadcasting to only telecommunication equipment licensing has included this service per se under the scope of telecommunication services! This, in our view, will result in confusion and legal uncertainty. Under the provisions of the Draft Bill, the aspects like broadcasting services, its tariffs, quality, content regulation etc. Would be covered in telecommunication license.

We, therefore, strongly view that the concerned definitions and the provision of Chapter 3 be amended

to keeping in mind that licensing should be for telecommunication network wherein type of service and related aspects may be mentioned, as a condition, if and only if, such service falls within four corners of what is capable of being produced from a telecommunication network. OTT Communication service, Broadcasting service, Internet based communication cannot, therefore, be included by way specific inclusions or by way of providing a very wide definition of telecommunication services while missing the basic ingredient of 'telecommunication network'.

We note that the existing legal and regulatory framework is getting negated by the Draft Bill, where the Central Government will have over-broad and far reaching powers and the roles of an independent Authority and Appellate Tribunal will get seriously diluted.

The Draft Bill makes significant amendments in TRAI Act, the functions of the Authority to make recommendations and discharge functions being significantly curtailed by subsections (d) to (k) in Section 46 in the Draft Bill. The provisions empowering TRAI to make recommendations and discharge functions are 'Notwithstanding anything contained in the Indian Telegraph Act, 1885'. The Draft Bill dilutes these non-obstante powers by substitution of 'In consonance with the Indian Telecommunication Act, 2022'.

In order to keep this momentum of growth of telecom sector in the country, the Authority needs to be an independent entity and operate within the framework of the existing TRAI Act. Any dilution in the powers of TRAI may have severe implications, including decline in investor confidence, which will be an act of deterrence to the growth of the sector. The respective subsections in Section 46 of the Draft Bill should be deleted.

Sub-section (j) and (k) of Section 46 of the Draft Bill which make different amendment in Section 11(20) of TRAI Act can have a serious impact on predatory pricing issues. Section 46(j) in the Bill is amending Section 11(2) of TRAI, and it dilutes TRAI powers by replacing existing non-obstante clause with 'in consonance to the Indian Communication Act, 2022'. With this TRAI's function under 11(2) become subservient to the Draft Bill and in the Draft Bill the Central Government has all the powers.

The introduction of power on issuing directions to TRAI under section 46(k) of the Draft Bill will result in Central Government having a role in matters pertaining to predatory pricing, which is not envisaged in the current framework and which role has to be conducted by independent regulators like existing TRAI and CCI.

We find that aspects like Appeal and Alternate Dispute Resolution in Chapter 3 of the Draft Bill is also at variance with functions of TDSAT as prescribed in TRAI Act. In our view, in light of existing provisions in the TRAI Act regarding adjudication of disputes there is no need of having Sections 10 and 11 in Chapter of the Draft Bill.

In short, we note that the existing legal and regulatory framework is getting negated by the Draft Bill, where the Central Government will have over-broad and far reaching powers and the roles of an independent Authority and Appellate Tribunal will get seriously diluted.

We believe that the scope of 'telecom infrastructure', as given in the Draft Bill, needs to be significantly enhanced to address faster rollout of 4G/5G and beyond, Satcom and other technologies through (i) legal provisions street furniture, (ii) legal provisions for deployment of small cells and in-building deployments and (iii) legal provisions for infrastructure providers' scope to cover active as well as passive elements in rendering services to telecommunication licensees. RoW permissions should be on technology neutrality basis, which will help in proliferation of Satcom, Public Wifi etc.

With respect to the Spectrum Management, it is most strongly iterated that there should not be any auction for satellite spectrum as it is a shared spectrum and auction will not be in line with international practice. Terrestrial spectrum and Satellite are on entirely different footing and as different as chalk and cheese.

The Draft Bill should include all satellite usage (including the GMPSC service) within the list of purposes for which spectrum can be assigned through administrative processes in line with international best practices and to give abundant clarity, the Draft Bill should explicitly specify unlicensed spectrum for Public Wi-Fi Use (5MHz) and for innovative applications such as Short-Range Devices (SRDs).

OTT COMMUNICATION SERVICES UNDER THE AMBIT OF IT ACT

OTT services, including OTT Communication Services, are clearly differentiated and can be distinguished from the definition of telegraph as provided in the Telegraph Act or from telecommunication services / telecommunication networks, as explained above. Thus, licensing under Indian Telegraph Act or its replacement, does not apply to OTTs. Moreover, OTTs services should be governed by the IT Act 2000, being information technology services.

With respect to the Spectrum Management, it is most strongly iterated that there should not be any auction for satellite spectrum as it is a shared spectrum and auction will not be in line with international practice.

Security concerns like KYC, if applicable, to OTT services in the interest of consumers may be addressed within the purview of the IT Act. The KYC is done by respective sectors independently even if they ride on telecommunication services.

The analogy is Banking, which heavily depends on telecommunication services for transactions including OTP over SMS and internet banking. All these transactions are messages.

With regard to KYC for Banking, the Banking Laws/Rules/Guidelines apply. On same principle, in case of OTT Communication APPs, if KYC is to be applied then the same should be under the IT Laws/Rules.

The KYC in case of banking is different than telecommunication, depending upon various aspects including traceability and security, which aspects may be similar to telecommunication, but the processes and governance is sector specific under different law. Similarly in case if there is a need for KYC for OTT Communication services, the processes and governance will be different to that of telecommunication or banking

and will be sector specific. It may be incorrect to assume that only because KYC of OTT is to be considered as a requirement, it needs to be brought under telecommunication law.

CONTRARY CONTENTIONS ARE NEITHER VALID NOR RELEVANT

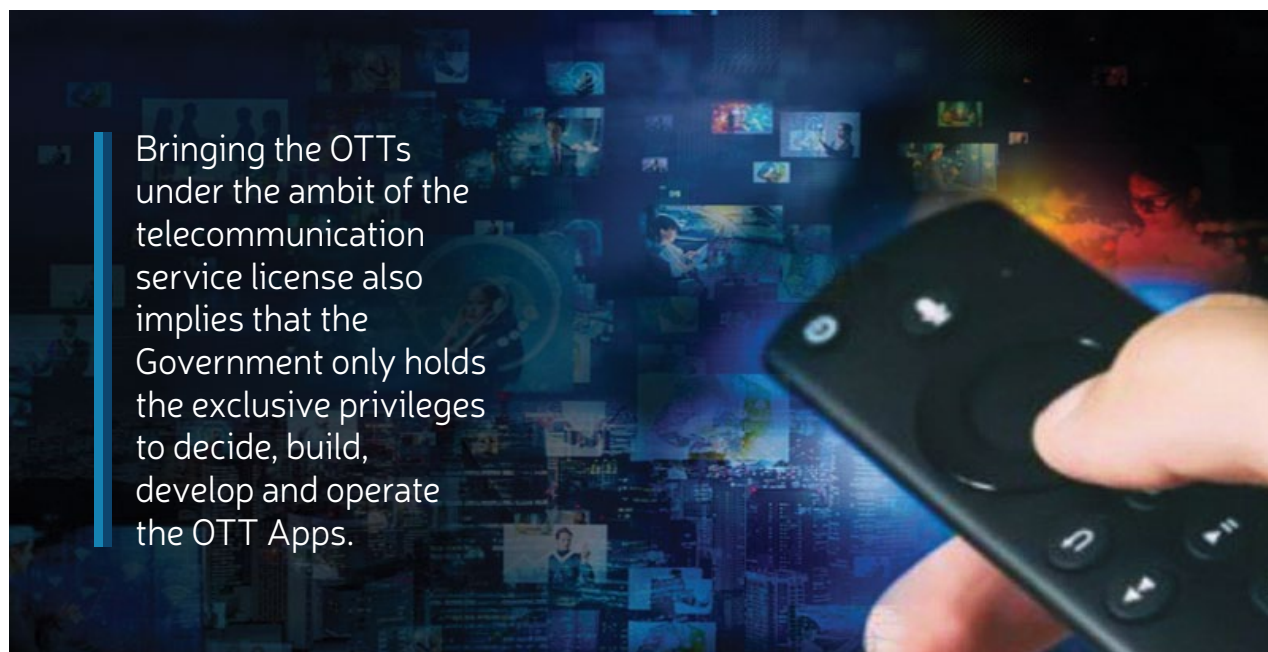
There are some contentions claiming that OTT Communication Services should be brought under the purview of Draft Bill for which the following reasoning is provided:

- Same Service Same Rule
- Level Playing Field
- OTT is a free riding service

BIF submits that such contentions are not correct, both under law and policy. Further such contentions may be driven by commercial objectives. These contentions cannot have any bearing on exercise such as the present, which is going to frame law of the land for many years to come.

OTT Communication Services are not same as TSPs' services, rather they are completely different.

Bringing the OTTs under the ambit of the telecommunication service license also implies that the Government only holds the exclusive privileges to decide, build, develop and operate the OTT Apps.



The commercial argument that OTT is a free riding service is neither correct nor is relevant for the current purpose. OTT service providers and users pay TSPs for network usage costs.

OTT Communications / OTTs are essentially Apps and not telecommunication services, and like any App, they use internet, and they do not own or work a telegraph / telecommunication network.

Telecom networks and OTT applications operate in different layers (network layer and application layer respectively).

Application layer is not part of telecommunication network and it will incorrect to assume that Government will have exclusive right to operate Apps and grant licenses in respect thereto. OTTs have no exclusive right to deploy their applications.

TSPs can, and often do, provide their own OTT application/s. On the other hand, an OTT application provider would need a licence to deploy a TSP Network.

In view of the above, OTT services are mere applications provided to end users over the internet. They neither operate a telecommunication network, nor lease telecommunication network capacity from a telecommunication network for the provision of their services.

For the same reasons, the Level Playing Field contention is also not correct. Art.14 of the Constitution of India guarantees equal treatment only to persons who are equally situated.

This is a well-established point and enough case law is available on the same. OTTs and TSPs have vast and critical differences between them and are not equally positioned, as explained above. Therefore, they cannot be treated as equals.

Moreover, unequals are also required to be treated unequally. Importantly, equal treatment to unequals is nothing but inequality. To put both categories at par is wholly unjustified, arbitrary, unconstitutional, being violative of Art.14.

Art.14 guarantees equal treatment to persons who are equally situated.

The commercial argument that OTT is a free riding service is neither correct nor is relevant for the current purpose. OTT service providers and users pay TSPs for network usage costs. Moreover, the business models of OTTs and TSPs are very different and OTT never bypasses and simply cannot bypass the Broadband/ Telecom infrastructure to provide the OTT services to its users. It is well acknowledged that there is a symbiotic relationship between APPs and TSPs and that means that both are different.

Regarding the TSPs' demand for an access charge for use of their network, the European Regulator - BEREC in its recent findings through BoR (22) 137, in October 2022, section 2, has affirmed that "ultimately, it is the success of the CAPs (Content & Applications) which lies at the heart of the recent increases in demand for broadband access or, from a different perspective, traffic growth beneficial to ISPs."

The other key points in this respect in the said BEREC report are as follows:

1. "There is no evidence of "free-riding". Costs for internet connectivity are typically covered and paid for by ISPs customers."
2. "There is a concern that a direct compensation from large CAPs to large ISPs could endanger the principle of net neutrality and lead to a competitive distortion putting smaller and medium-sized ISPs at a disadvantage despite the fact that such alternative players often account for a considerable amount of the fibre network roll-out."
3. "Traffic is requested and thus "caused" by ISPs 'customers and not by CAPs."
4. "Ultimately, it is the success of the CAPs [...] which lies at the heart of the recent increases in demand for broadband access" or, from a different perspective, traffic growth is beneficial to ISPs"
5. "CAPs and ISPs are mutually dependent on each other. The demand from ISPs customers for content

We believe that the scope of 'telecom infrastructure', as given in the Draft Bill, needs to be significantly enhanced to address faster rollout of 4G/5G and beyond, Satcom and other technologies.

drives demand for broadband access. Availability of broadband access drives demand for content."

6. "Both sides of the market – CAPs on the one hand and users of these applications on the other hand – already contribute to paying for Internet connectivity. There is no evidence that operators' network costs are already not fully covered and paid for in the Internet value chain (from CAPs at one end, to the end users, at the other)"BEREC's preliminary assessment is that this still holds true in 2022 as it did in 2012. "

7. "In 2012, BEREC refuted the argument that traffic is "caused" by CAPs: "ETNO's proposals do not seem to have taken account of the fact that the request for the data flow usually stems not from the CAP but from the retail Internet access provider's own customer (who "pulls" content provided by the CAPs, and from whom the ISP is already deriving revenues). Ultimately, it is the success of the CAPs (from whom ETNO wishes to extract additional revenues) which lies at the heart of the recent increases in demand for broadband access (i.e. for the ISPs 'very own access services)". The fact that the flow of data is done at the request of the ISPs 'customers could for example be seen during the COVID-19-crisis where internet traffic increased significantly for a period based on end-user demand. "

It is submitted that if OTT Communications are included in the ambit of the Draft Bill then, besides other reasons, the same will go against the interest of economy for the following reason:

1. Internet openness promotes innovation, investment, and competition and has been one of the primary reasons behind the huge success of Apps. Even in case of OTT Communication Services, the major application and content providers were all new entrants at some point, and the power of ideas pushed through the open internet helped them to establish themselves.

2. The Draft bill appears to have misplaced priorities toward protecting TSPs' interest over consumers' interest. This runs counter to the interests of the consumers as it would:

- i. Create an entry barrier, lowering and harming the competition in the OTT market; and
- ii. Create a limited set of technology or media information provided to users with the intention of creating a monopoly or secure information.

The proposed intent in the draft bill will adversely affect the innovation in the OTT industry that spurs investment and generates spin-offs in the economy.

Examples are airline booking, hotel reservations, taxi transportation etc. where aggregated service sourcing through Internet applications has enabled businesses to reduce costs and design new pricing models tailored to individual customers without the applications provider owning inventory, property, or directly providing the end- service.

In view of the above it is respectfully submitted that OTT Communications Service should be excluded from elements in the definition of telecommunication services in the Draft Bill.

Internet based communication services should be deleted from the elements included in the definition of Telecommunication Services

Internet based communication service are also APP based services and not telecommunication services. We submit that the reasons given with respect to OTT Communication services for exclusion from definition of telecommunication services would also apply to Internet based communication services and such service be excluded from elements in the definition of telecommunication services in the Draft Bill. 🙏

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Key Highlights



NEP 2020
Aligned
Curriculum



Blended mode
of learning



Focus on
Holistic
Development



Optimum
Student-Teacher
Ratio



Play-way
method based on
Thematic Curriculum



Excellent
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A Review of Draft Indian Telecommunication Bill, 2022

A review was earlier attempted through the draft Communication Convergence Bill in the year 2000-02 but without much progress or success



BY PRAVEEN SHARMA

Bringing in a new law while repealing law (Indian Telegraph Act 1885) which is more than 137 years old requires some courage particularly on the subject as complicated as telecom licensing and couple it with need to repeal other law (Indian Wireless Telegraphy Act 1933) which is about 90 years old requires lot of commitment, daring and handwork. Daring, because this was earlier also attempted with draft Communication Convergence Bill in the year 2000-02 but without any success. It is for this reason that I want to begin this review with a word of thanks and appreciation for the present leadership at Department of Telecom led by Hon'ble Cabinet Minister Shri Ashwini Vaishnaw.

There was always a crying need for a new Statute to govern telecom services as earlier Acts namely the Indian Telegraph Act 1885, the Indian Wireless Telegraphy Act 1933 and the Telegraph Wires (Unlawful Possession)

Act 1950 have lived their utility and new Act was required to consolidate the provisions of aforementioned three Acts with the advancement of technology and to address new evolving business models. The new Law to govern provision, development, expansion and operation of telecommunication services, networks and infrastructure, spectrum assignment and matter related to all of aforesaid.

I know for sure that lot of thought, hard work and mid night oil has gone in the drafting of this draft Indian Telecommunication Bill 2022 and a critique / review of the draft is no way to berate the hard work but to give constructive suggestions on what further can be done with the draft Bill.

CHAPTER 2 DEFINITIONS

2 (5) "customer equipment" means equipment deployed on the premises of a person, other than the equipment

There was always a crying need for a new Statute to govern telecom services as earlier Acts namely the Indian Telegraph Act 1885, the Indian Wireless Telegraphy Act 1933 and the Telegraph Wires (Unlawful Possession) Act 1950 have lived their utility.

of the licensee or registered entity, to originate, route or terminate telecommunication, or equipment used by such person for accessing telecommunication services;”

Comment: The Definition of “customer equipment” is very vague. Does it debar licensee from deploying customer equipment at customer premises? What is the difference between the terms “to originate, route or terminate telecommunication” and “for accessing telecommunication services;” in the definition above? There is a need to provide clearer definition in the Bill.

One may argue that the reason to define ‘customer equipment’ in the manner it has been defined is to restrict entities from using Radio backhaul using the customer equipment as the telecommunication equipment Clause 2(18) as defined includes the customer equipment however a customer equipment cannot be used for backhaul creation. However, when we look at the definition of Telecommunication network clause 2(20), it does not consider customer equipment as part of the telecommunication network. Now, this would create a dichotomy as telecommunication networks are used to provide telecommunication services however the customer equipment are part of the service but not the part of network. This may cause concern towards compliance to various standards regarding those equipment which resides at customer premise (under the ownership of the customer). However, it is essential to deliver telecommunication services by connecting them to the telecommunication network. It is understood that Customer will be taking the ownership of such equipment to ensure compliance with the respective standards for the ‘customer equipment’ as the same are not part of telecommunication network.

2(20) Reason for exclusion of customer equipment from the definition of telecommunication network is not very clear.

2(21) Definition of telecommunication services: Definition of the term telegraph in the earlier Indian Telegraph Act 1885 was very vague, dated and all-encompassing and reads as follows:

[(1) “telegraph” means any appliance, instrument, material or apparatus used or capable of use for transmission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, visual or other electro-magnetic emissions, Radio waves or Hertzian waves, galvanic, electric or magnetic means.

Explanation. – “Radio waves” or “Hertzian waves” means electro-magnetic waves of frequencies lower than 3,000 giga-cycles per second propagated in space without artificial guide;]

Under first proviso to the Section 4 of the Indian Telegraph Act 1885, Government had the power of licensing in following terms “Central Government may grant a license, on such conditions and in consideration of such payments as it thinks fit, to any person to establish, maintain or work a telegraph within any part of [India]”. All the present licenses of telecom services are issued in pursuance of powers under provision as mentioned aforesaid and it can be seen that definition of telegraph is very wide and therefore the Government licensed whatever services it wanted to.

The new Act rightly changes the basis of licensing from telegraph to telecommunication services and there was an opportunity to bring more clarity and regulatory certainty to the statutory provisions of licensing requirements for telecom services. Unfortunately, definition of telecommunication services in the new Bill is also very vague and all-encompassing. What is needed is exact clarity in terms of what/which are the services which would require license in terms of existing services and which are new services proposed to be added in the licensing regime on light-touch regulation basis or even otherwise. Use of very generic terms like Internet-based communication services, video and data communication services, Interpersonal communication services, and over-the-top (OTT) communication services makes the definition and requirement of licensing vague and subject to diverse subjective interpretation, which any draftsmen of new statute would ideally avoid. There is an element of inherent regulatory uncertainty as the services proposed to be licensed are not listed in the definition.

The new Act rightly changes the basis of licensing from telegraph to telecommunication services and there was an opportunity to bring more clarity and regulatory certainty to the statutory provisions of licensing requirements for telecom services..

Any services/ solution which use telecom connectivity services as an input service but provides some other services should not attract license requirement barring those services which are similar in nature and substitutable to the licensed telecom services. Therefore, the definition of telecommunication services should only cover the licensed services, i.e., Wireless Access services, Internet Access services, NLD, ILD, GMPCS and other licensed services only and OTT Communication Services which are similar and substitutable to licensed telecommunication services. It should exclude wireline access services, e-mail, voice mail, audiotex, videotex, and internet-based communication application services.

Further, the definition of terms needed like RoW, OTT Communication services, Internet Communication services need to be provided in the new bill.

CHAPTER 3: LICENSING, REGISTRATION, AUTHORIZATION AND ASSIGNMENT

Section 3 Exclusive Privilege: The exclusive privilege Section 3(1) and licensing power Section 3 (2) is now in respect of telecommunication services and not telegraph which is an improvement over existing Act.

However, the need for having power, in the public interest, to exempt the requirement of license, registration, authorization or assignment under sub-section (2), in the manner as may be prescribed is debatable particularly when public interest conditions are abstract and not defined and is discriminatory towards licensed entities.

Section 4 Licensing, Registration, Authorization and Assignment

4(1) : Since the license agreement is a contract there is no need to mention specific terms and conditions of license in the Act as is being done as it takes away the flexibility of the Government to determine terms and conditions of the license. Supreme Court as per *UoI and Anr vs AUSPI and ORs* SC judgment in SLP CA 5059 of 2007, has held a license granted under proviso to sub-section

(1) of Section 4 of the Telegraph Act is in the nature of a contract between the Central Government and the licensee. Any specific mention of terms of license would take away the flexibility in framing terms and conditions of license. Amended Clause 4(1), it is suggested should read as under:

“4(1) The grant of license, registration, authorization or assignment under sub-section (2) of Section 3, shall be subject to terms and conditions, including payment of entry fees, license fees, registration fees or any other fees or charges by whatever name called, as may be prescribed.”

4 (2) : Regarding prohibition to amend terms of license retrospectively: Exception provided for in Section 4 (2) should be removed or alternatively conditions, where such modification would be resorted through, should be provided.

Section 5 : Spectrum Management

Section 5(2)(b): Assignment of Spectrum without auction administratively: There is a provision in the Bill that the Government may assign spectrum through an administrative process for Governmental functions or other purposes or purposes in view of public interest or necessity as provided in Schedule 1. The Government will have the discretion to decide to whom it would allocate spectrum on administrative basis as it has reserved power to amend the list of entities in Schedule 1 as per item no 19 of Schedule 1. Schedule 1 lists PMRTS, radio backhaul for telecommunication services, satellite-based services like teleports, Direct to Home (DTH), DSNG, VSAT, NLD, ILD, Mobile Satellite Service, etc. There is a need to include CNPN services in Schedule 1 as per the latest policy decision of the Government reference DoT letter dated 27th June 2022 issuing Guidelines for CNPN license. The Government also needs to allocate spectrum administratively to ISPs for broadband services and also replacement spectrum to those ISPs who have vacated spectrum in 3.3 GHz band.

There are provisions to delicense spectrum in the Bill

There is a need to review some of the clauses to make this Bill clearer and more transparent for the industry, which is vital for attracting more investments in the sector.

(Section 5(5)) which needs to be exercised more often by the Government .

Section 6 : Sharing, Trading, Leasing and Surrender of Spectrum

Rules for spectrum sharing and trading should be liberalized further. In a welcome move , Spectrum leasing is also enabled through the new Act reference Section 6 of the new Bill which may create a secondary market for spectrum and proliferate efficient and better usage of a scarce natural resource in case spectrum user club is game for this commercial opportunity.

Section 7: Breach of Terms and Conditions

The proposed Bill consolidates, updates and simplifies various provisions on penalties and offences under the existing law. For breach of terms and conditions, the Government, among others, can issue cease and abstain orders, suspend a license, registration, authorization or assignment, curtail the period of such license, registration, authorization or assignment or revoke or vary such license, registration, authorization or assignment. There is significant reduction in the quantum of penalty. Breaches have been categorized as (i) Severe (Penalty up to Rs.5 Crore), (ii) Major (Penalty up to Rs.1 Crore), (iii) Moderate (Penalty up to Rs.10 Lakh), (iv) Minor (Penalty up to Rs.1 Lakh), and (v) Non-severe (Written warning). Defined in Schedule 4 of the proposed Bill. A licensee can give a voluntary undertaking to take specified action to rectify the breach as per Section 8 of the Bill. This is a very big positive for the industry and promotes Ease of Doing Business (EoDB) in a big way.

8. Voluntary Undertaking

The proposed Bill has introduced a new concept of 'voluntary undertakings'. To this end, the licensee or registered entity has an option to voluntarily disclose any breach of the license or registration terms by giving an undertaking that specified action will be taken by such entity. Once the voluntary undertaking is accepted by the DoT, it shall bar any proceedings against such entity. This is also a very innovative solution and will result in open and transparent working.

9. No refund of fees

The move to refund amounts in case of voluntary surrender of license by an Entity is a welcome move.

10&11. Appeal & Alternate Dispute Resolution

Appellate Authority needs to be defined.

Introduction of Alternate Dispute Resolution -(ADR) Settlement process in the draft Bill, will dilute the exclusive powers of the sectoral adjudicating expert body namely TDSAT. which has come into existence because of a special TRAI Act. This is a grave cause of concern as the "suitable mechanism" for ADR has not been mentioned in the proposed draft Bill and can be arbitrarily notified by the Government in its favour later.

CHAPTER 4: RIGHT OF WAY FOR TELECOMMUNICATION INFRASTRUCTURE

The proposed Bill seeks to remove current limitations by providing an enforceable and enabling framework that facilitates RoW for laying or building telecommunication infrastructure by any facility provider. The term "facility provider" includes any licensee or registered entity, including any contractor or sub-contractor or agent working for the Central Government or licensee or a registered entity.

Right of Way needs to be defined.

There needs to be a non-obstante clause in the Central Government powers to prescribe charges under this Act which should give over-riding effect to any other Act of Central/State Government and Rules made thereafter or any other Rules made by any of the Public Entity defined under this Act.

Therefore, clause 13(2) needs to be revised as follows:

13(2) The public entity shall grant permission under sub-section (1) in an expeditious manner, and within the timelines, as may be prescribed failing which the permission will be deemed to be granted after prescribed timeline elapses.

TRAI has been entrusted with the function of ensuring compliance to the terms and conditions of the license vide Section 11(1) (b)(i) and there are some field units of TRAI operational, DoT LSA units are performing these functions.

The new bill should contain a provision that the local authorities – municipality, gram panchayat, development authority etc. would need to align their building bye laws in line with Central Government rules/ provisions related to telecom services.

CHAPTER 5: RESTRUCTURING, DEFAULTS IN PAYMENT AND INSOLVENCY

21. Special Framework governing defaults in payment by licensees, registered entities or assignees: A special framework governing payment defaults by licensees has been included in the Act wherein the Government can take measures to defer payments, convert shortfall payments into shares of licensee or write off such outstanding amounts or part thereof and relief from payment of such amounts or part thereof.

There is a need to have a similar framework governing the payment of the dues by the licensees whose assessment of dues is delayed due to various reasons including litigation and the Government should have the power to take such payments in installments when such payments get assessed and determined by the Government.

22. Power to waive fee, interest, additional charges, penalty or grant exceptions

The Government has also reserved the power to waive, in part or full, any fee, interest, additional charges, penalty or grant exception in case of mitigating circumstances, including interests of consumers, ensuring competition, continued supply of services, and any circumstance of public interest or national security. This power should be exercised in cases where dues are claimed in a delayed manner by the Government due to delay in assessment or reasons including litigation. Interest, Penalty and Interest on Penalty should be waived in all such cases and simple interest should be applied for such dues in for the reason of fairness.

CHAPTER 6: STANDARDS, PUBLIC SAFETY AND NATIONAL SECURITY

23. Power to prescribe standards

23 (c): In respect of 23 (c) regarding issuing standards

on reliability of the provision of any telecommunication services to the public, there is an avoidable overlap of powers with TRAI as TRAI has executive powers on QoS issues which includes reliability of services. Section 11(1)(b)v states that TRAI will discharge the function of “lay-down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical survey of such service provided by the service providers so as to protect interest of the consumers of telecommunication service”. There is a clarity needed on which Authority will discharge this function. There is a similar overlap regarding which Authority will ensure compliance to the terms and conditions of license on which also some clarity is needed. While statutorily, TRAI has been entrusted with the function of ensuring compliance to the terms and conditions of the license vide Section 11(1) (b)(i) and there are some field units of TRAI operational, DoT LSA units are performing these functions.

24. Provisions for Public Emergency or Public Safety

For the sake of transparency and clarity there is need to define the terms Public Emergency, Public Safety, Public Order. Suitable illustrations may be given for better clarity.

CHAPTER 7: TELECOMMUNICATION DEVELOPMENT FUND

USOF has been named as Telecom Development Fund and scope of the Fund has been widened significantly to include R&D and support introduction of new telecom services, technologies, and products. Also added in the scope is the functionality of skill development and training in telecom. Licensees have been paying 5% of their AGR as contribution towards this Fund and TRAI in 2015 had recommended reduction of this levy to 3% of AGR. Further, the levy of 5% for USO was fixed in 2000 when the telecom network coverage was very poor in the country. It would be therefore in the fairness of the things if the individual licensee's contribution is reduced to 2 % of the AGR for 7 years have already elapsed when TRAI recommended making this levy at 3% of AGR.

The Bill proposes amendments to the Telecom Regulatory Authority of India (TRAI) Act, 1997 which significantly dilutes the recommendatory power of TRAI and gives DoT more than an upper hand.

CHAPTER 9: PROTECTION OF USERS

33(1)&(2) Unsolicited Message Framework: The Bill creates a framework for the government to protect users from 'specified messages'. 'Specified messages' have been defined as messages that offer, advertise, or promote goods, services, solicits interest in property, businesses, employment, or investment. The Bill provides for prior user consent, preparation, and maintenance of Do Not Disturb (DND) registers and the mechanism to enable users to report specified messages received in contravention of this Section. This is in addition to the measures taken by TRAI under its TCCCP Regulation 2018 which have not provided effective remedy against the unsolicited communications to the end Users.

34. Duty of Users: No user shall furnish any false particulars, suppress any material information or impersonate another person while establishing identity for availing telecommunication services and any non-compliance of the same would entail penalty as provided in the Bill.

Tighter KYC norms and traceability of messages: The proposed Bill requires licensed entities to ensure that they identify the persons to whom they provide telecommunication services. The Bill places an obligation on TSPs to do this through a 'verifiable mode', as prescribed by the government. This would also be applicable to users of OTT communication services and its service providers.

Application of provisions of proposed Personal Data protection legislation: In order to protect the customers, the new bill can have a provision that the relevant provisions under the Personal Data Protection applicable law would be applicable to customers availing telecom services.

Spam Control/Fraud Prevention by mandatory user identity and traceability of communication.

Framework for Internet Shutdown: Clause 24(2)(b) provides a clear statutory internet suspension power,

which did not exist earlier. There is no provision for judicial oversight over the suspension orders.

46. Amendment to Act 24 of 1997

Dilution of TRAI Act: The Bill proposes amendments to the Telecom Regulatory Authority of India (TRAI) Act, 1997 which significantly dilutes the recommendatory power of TRAI and gives DoT more than an upper hand in dealing with TRAI recommendations. For example, the Government can straight away reject the recommendations of TRAI without giving any reasons and without the requirement of sending a reference back. Additionally, there is no obligation cast upon the Government to necessarily seek recommendations of TRAI in respect of terms and conditions of the license. The proposed changes are against the principles of transparency, accountability and constructive cooperation between the statutory Regulator and the Government. It also dilutes the stature of the statutory Regulator as an expert body.

Since lot of powers are proposed to be exercised by the Government unilaterally now, it is essential that these powers are exercised in a transparent manner for which a clause similar to Section 11 (4) of the TRAI Act should be there as follows:

"The Central Government shall ensure transparency while exercising its powers and discharging its functions under this Act."

I applaud the Government efforts in bringing this Draft Bill which is a revolutionary step towards more certainty and ease of doing business for Telecom Sector. However, there is a need to review some of the clauses as highlighted in above review to make this Bill clearer and more transparent for the industry which is vital for attracting more investments in the sector. 🙌

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How to make the Internet truly multilingual

Enabling people to reap the incredible benefits of the Internet in their own languages and scripts is a matter of equity and inclusion



BY JIA-RONG LOW

Most people around the world don't speak English as a first language and don't use the Latin script. For many of them, the fact that most domain names, email addresses, and websites are in English and use the Latin script, presents a significant hurdle to accessing the Internet.

It does not have to be that way. Internationalized Domain Names and Universal Acceptance are the bridge that will bring the next billion users online and create an Internet that is truly multilingual. We only need to build and cross it.

While English is not the first language for most of the world, it is the most used language on the Internet. The prevalence of English and the reliance on its alphabet (i.e., the Latin script) creates significant obstacles for, and potentially excludes, billions of people who would prefer to access the Internet in their own languages and scripts.

Enabling people to reap the incredible benefits the Internet provides in their own languages and scripts is a matter of equity and inclusion. It can also unlock vast educational, cultural, and economic opportunities. This is particularly important for Asia generally, and India

When people realized that they could access websites purely in their own script, the excitement on their faces was clearly visible. Language is a barrier for entry to the Internet, and IDNs can help break it down.

The National Internet Exchange of India (NIXI) currently runs 15 IDNs covering 22 Indian languages. The Indian government is also working to digitize 650,000 villages. This could lead to at least 650,000 IDNs.

specifically, where projections say most of the next billion Internet users are located.

Internationalized Domain Names, or IDNs, and Universal Acceptance of IDNs are the bridge transporting us to the multilingual Internet of tomorrow. IDNs make it possible for people around the world to use domain names in their local languages and scripts, while Universal Acceptance, or UA, ensures that all systems connected to the Internet recognize and render different languages and scripts properly.

I have travelled to different countries in the region, such as Cambodia, Laos, Myanmar, and Thailand to talk about IDNs. When people realized that they could access websites purely in their own script, the excitement on their faces was clearly visible. Language is a barrier for entry to the Internet, and IDNs can help break it down.

From these trips, we have since established many Label Generation Panels, which are working groups comprised of language and coding experts who determine which characters and letters can be included in a top-level domain name. The work for 26 scripts has now been completed, 19 of these scripts are used in the Asia Pacific region. That most of them are being used here only underscores the tremendous opportunities we have.

It surely helps when governments, like India's, strongly support IDNs. The National Internet Exchange of India (NIXI) currently runs 15 IDNs covering 22 Indian languages. The Indian government is also working to digitize 650,000 villages. This could lead to at least 650,000 IDNs coupled with business opportunities for web designers, providers, e-commerce services, and others all flowing from those local language websites.

The country is also home to some 20,000 local language media outlets. While most of them have an Internet presence, to access their websites one still needs to type the English alphabet. Imagine being able to access

your local language media in Hindi or other languages? Imagine the creative and economic potential this could unleash?

Unfortunately, IDNs by themselves are not enough to create a truly multilingual Internet. Software and applications need to be programmed to accept IDNs. Many programmers are still not aware of the existence of IDNs and, as a consequence, most current software and applications only accept familiar domain names, such as .com, .org, or .in. We therefore need to not only raise awareness with technology companies, but, where required, help train their programmers to code their applications in such a way that they are able to render, or accept, all IDNs and long-form top-level domains. This is what the term Universal Acceptance describes.

In India, despite laudable government efforts to boost IDNs, there is still plenty of work left to do. According to a report (<https://uasg.tech/download/uasg-027-country-based-evaluation-of-websites-for-acceptance-of-email-addresses-in-2020-en/>) by the volunteer-led Universal Acceptance Steering Group of 50 local websites surveyed in India, including government, media, academia, bank and e-commerce, only 11 percent accept Hindi IDN emails.

It does not have to be this way. India is poised to lead the way for the region when it comes to IDNs and UA, and ICANN stands ready to help. Partnering with the government of India and different stakeholders including the UA Local Chapter led by the Federation of Indian Chambers of Commerce & Industry (FICCI), we are planning various activities in 2023 to spread the word about IDNs and UA.

The future of the Internet is multilingual. Let's build it together. 🌐

Jia-Rong Low is Regional Vice President and Managing Director at ICANN Asia Pacific

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Prerna Singh
Founder President, Promising Indian Society

“PM WANI & Promising Indians – spreading WiFi coverage in the country”

*Promising Indians has been expanding the WiFi footprint using the PM WANI framework to enable remote and rural populations easy access to the Internet. **Perna Singh**, director and founder spent some time to give her perspectives on the changing landscape of Internet in India.*

WHAT HAS BEEN THE JOURNEY OF PROMISING INDIANS WITH PM WANI SO FAR – NUMBER OF HOTSPOTS, USAGE AND NEW APPLICATIONS LAUNCHED

Promising Indian Society is currently implementing PM WANI projects in Uttar Pradesh, Gujarat, Chhattisgarh, Uttarakhand, Rajasthan, Punjab and Bihar for premium parliamentary constituencies. The experience so far has been very enriching and challenging at the same time.

There is a long way to go for creating desired digital infrastructure as the ground reality is lack of awareness amongst masses, inadequate fibre lines with almost nil maintenance and software support from centre.

We are committed to create 1 lakh Entrepreneurs by implementing PM-WANI Projects on PAN India basis till 2024. We have been working on 112 Aspirational Districts for creating public WiFi hotspots together with a few Members of Parliaments (MP) at different locations. We have submitted proposals to various Public Sector Undertakings, Corporates and organisations to join hands together and take this project to next level.

We have received approvals for 250+ hotspots in the states of Gujarat, Rajasthan, Uttarakhand, Uttar Pradesh, Punjab, Chhattisgarh and Bihar. There is wide acceptance from public and now we have raised demand of more than 1000 hotspots at various locations.

The data usage in 4 months is more than 1 terabyte.

WHAT IS THE NEXT STAGE OF DEVELOPMENT OF SOME OF THE KEY CONSTITUENCIES LIKE VARANASI AND GANDHINAGAR WHERE YOU ARE USING WIFI TO ENABLE HEALTH AND EDUCATION INITIATIVES

Time and cost are two critical elements for the implementation, the key question is how we can rollout the broadband connectivity to the rural areas in the quickest and most cost-effective manner. The government is keenly looking forward to the speedy implementation of broadband connectivity for the success of its 'marquee' Digital India program.

Promising Indians Society is the only organization which is implementing PM-WANI projects under CSR initiative to create entrepreneurs at grassroot level. Not only it will create self-sustainable model but also empower small business owners/ shopkeepers by augmenting their income.

The uniqueness of using the premium constituencies is the model which we will be setting up will reach out to

We have received approvals for 250+ hotspots in the states of Gujarat, Rajasthan, Uttarakhand, Uttar Pradesh, Punjab, Chhattisgarh and Bihar. There is wide acceptance from public and now we have raised demand of more than 1000 hotspots at various locations.

My Vision for DigiGaon is simply empowering Rural Women through Multi-Skilling, and capacity building to convert them into Village Level Entrepreneur (VLE) and work as PDO (Public Data Office) under PM-WANI (Pradhan Mantri- Wifi Access Network Interface) framework.

masses quickly. The concept of “PM-WANI” framework, enables, the creation of a public hotspots for use of the local entrepreneurs to enable them to provide much needed broadband access to rural masses as a business case without any perpetual subsidy. We have aggressive plans for next year when dream of our Hon'ble Prime Minister will be realized in his own constituency.

HOW IS WIFI ENABLING A SOCIAL AND INCLUSIVE REVOLUTION IN OUR COUNTRY ?

Internet has become a necessity. The Internet is not just an information tool but is now a personal, social and economic development platform. The Internet has changed business, education, government, healthcare, and even the ways in which we interact with our loved ones—it has become one of the key drivers of social evolution.

Importance of the internet was driven home during COVID. It became a lifeline. From education to health and safety, daily groceries to social interactions everything relied totally on digital platform and internet connectivity. The demand for high speed data has increased many fold. The application ecosystem has fuelled the data consumption in the form of videos. This trend is not going to slow down. In fact, it will further fuel more activities online.

Offering Internet-based digital services is the key determinant of digital empowerment of citizens. It boosts entrepreneurship leading to new avenues of employment. For low income segments affordability of high speed Internet access is still a challenge. We need high speed public Wi-Fi at affordable rates to meet such demand. At present, there are around one lakh Wi-Fi hotspots in the country. As a public data office many entrepreneurs have set up public Wi-Fi hotspots under the PM-WANI framework.

We as PDO are trying to solve the problem of poor Internet connectivity and to bring high speed Internet

at low cost within the reach of every Indian for digital inclusion and reducing the digital divide in country through our organisation.

PROMISING INDIANS – THE FOUNDATION – ALSO HONORS ACHIEVERS IN THE TECHNOLOGY AND SOCIAL SECTORS – WHAT ARE YOUR CORE OBJECTIVES AND REASONS FOR THIS

The 6th edition of one of the largest annual flagship events “Promising Indian Conclave & Awards 2022” is taking place at Constitutional Club of India on 18th of December, 2022. This is one of the largest corporate events and the ethos behind constituting these awards is to globally present India as a business destination.

We have one exclusive category of Idea & Innovation wherein we award people in the field of Technology.

This event has a focussed session on PM-WANI to discuss the challenges and the way forward for PM-WANI Projects. There will be one panel discussion representing key stake holders from Ministry, Department of Telecommunications, C-DoT etc. in the conclave.

WHAT IS YOUR VISION ON DIGIGAON ?

My Vision for DigiGaon is simply empowering Rural Women through Multi-Skilling, and capacity building to convert them into Village Level Entrepreneur (VLE) and work as PDO (Public Data Office) under PM-WANI (Pradhan Mantri- Wifi Access Network Interface) framework.

We will support the leadership and participation of rural women in all issues that affect their lives with better rural livelihoods. This all is possible because of the training imparted by us will skills to pursue new livelihoods and adapt technology to their needs. 🙌

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Nykaa



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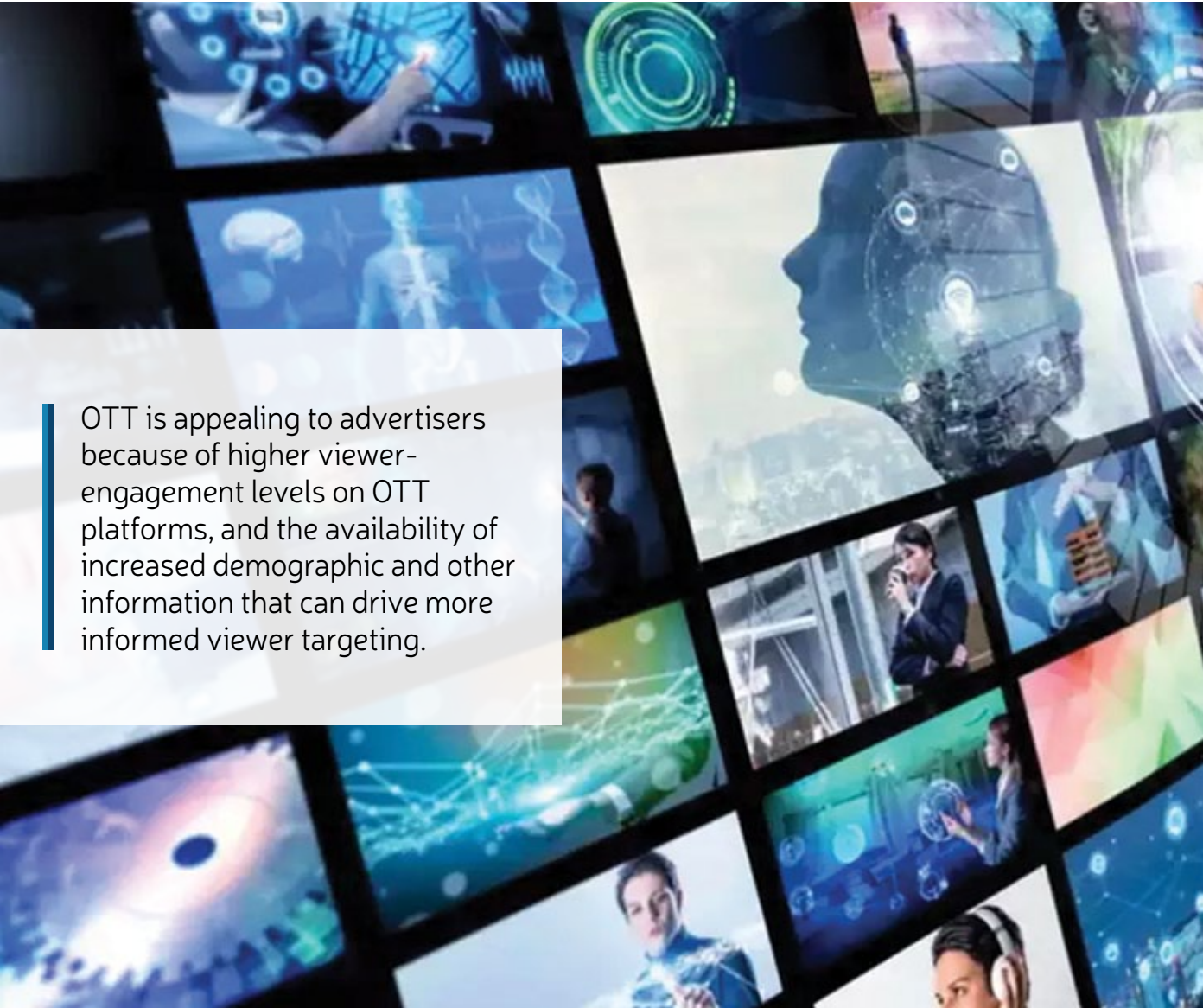
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Key reasons why broadcasters must integrate OTT into their distribution strategy

The OTT world offers devices that are purpose built for specific need-states, from mobile devices accessible on the run, to smart TVs larger screens and lean-back vibe.

BY RICK ALLEN



OTT is appealing to advertisers because of higher viewer-engagement levels on OTT platforms, and the availability of increased demographic and other information that can drive more informed viewer targeting.

As a country with one of the youngest populations in the world, India has adopted digital media extremely aggressively. This growth is spurred on by millennials who have changed the way India shops, creates friendships and most of all, consumes content. Infinite choice is not merely a reality – especially for the young, it is an expectation. That extends to selection of languages, devices, genres and viewing times. India's enormous diversity produces an ever-growing volume of content for an audience that expects to make their own viewing choices.

First, audiences have demonstrated a clear preference for digital consumption of news and entertainment,

where OTT video streaming services allow each consumer to watch whatever they want, whenever they want it. Deloitte's 2022 Technology, Media, and Telecommunications report predicts that India's OTT space will grow at a CAGR of more than 20% to reach US\$13–15 billion over the next decade. Deloitte says that this growth will be driven by heavy investment in original content, pricing innovations, low data costs, and the rise of short-form content. More importantly, the analyst firm also says that the progression from the early to mass stage might come at a cost to the broader media industry, as subscribers, especially in tier-1 and tier-2 cities, may switch from watching traditional linear TV to more streaming. That makes OTT distribution a fertile ground to attract new viewers, and a necessity to retain your existing audience.

The OTT world offers devices that are purpose built for specific need-states, from mobile devices accessible on the run, to smart TVs larger screens and lean-back vibe. News organizations are leaning into each of these device categories to become the natural home when news breaks, and the constant improvement of connection speeds will shift even more live news viewing to OTT.

As the above Deloitte report notes, the market for providing video streaming services in India is highly fragmented, with more than 40 streaming players vying for the Indian customer's attention and wallet. There are global streaming service providers such as Amazon, Hotstar and Netflix who are competing with local players such as Zee5 and Voot, in addition to a number of regional players (including those offering global access to content in regionally-dominant languages).

ADVERTISING-BASED VIDEO ON DEMAND MODELS

As streaming surges, the popularity of advertising-based video-on-demand (AVOD) is growing rapidly as an OTT streaming business model. The Deloitte report notes that AVOD in India is expected to increase from a revenue of US\$1.1 billion in 2021 to US\$2.4 billion by 2026. As AVOD audiences grow, many advertisers are making their ad buys "contextually" - placing their products in front of viewers whose choice of content indicates a predisposition favorable for the advertiser. Accordingly, more and more Indian broadcasters are adding OTT services, and OTT ad units, to their offerings for advertisers. OTT is appealing to advertisers because of higher viewer-engagement levels on OTT platforms, and the availability of increased demographic and other information that can drive more



As streaming surges, the popularity of advertising-based video-on-demand (AVOD) is growing rapidly as an OTT streaming business model.

informed viewer targeting. Trends in other markets offer clues for Indian broadcasters: some 40% of Disney's recent record-breaking ad "upfront" came from OTT sales, for example.

Similarly, advertisers can modulate their ad frequency to track streaming viewing behavior, like "binge watching" (viewers who watch more than two episodes of a particular show in a single viewing). These ad buys are meant to target those streaming over a long period and can be specific to the show being watched. The repetition necessary for effective advertising can now be delivered in part by taking advantage of bingeing behavior.

Broadcasters' expertise lies in content creation, audience analysis, and effective marketing. Streaming services having substantial expertise working with broadcasters can greatly simplify the technical lift of a robust OTT presence. At ViewLift, we have spent years learning the workflows required within news organizations, as distinguished from those of movie studios or sports leagues. For viewers to focus on the content, everything behind the scenes needs to be optimized for internal broadcast staffers to have the easiest route from production to delivery. And broadcast business owners require real-time analytics, across the full panoply of device types. Your winning streaming partner will be one with the right domain expertise and easy-to-use feature-rich back-ends.

USE AN OTT STREAMING PLATFORM TO INTEGRATE OTT INTO YOUR BROADCAST DISTRIBUTION AND ADVERTISING STRATEGY

OTT streaming solutions come with several features, like geo-fencing, multi-language support and localized payment platforms, allowing clients to take their content to a global audience. A case in point is oichoi, an OTT streaming service that offers Bengali-language content directly to viewers across the world. By partnering with Viewlift, the company customized its platform to optimize the content delivery via popular smartphone brands even in low network-bandwidth environments. Besides being integrated with local network service providers

and a breadth of payment methods, the platform offers a multilingual user interface to capture and engage its audience. The result -- 65% YoY growth in SVOD revenue; 13 million subscribers in the first three years of operation; and 40% of revenue from international users.

In a world of endless viewing choices, speed to market becomes a critical factor for content owners deploying OTT services. For RugbyPass, the largest independent English-language rugby audience network, that meant launching a fully functional streaming service in just four days by partnering with ViewLift and using the company's fully customizable ready-to-deploy app. Combining that entry speed with ViewLift's full global payment capabilities allowed the company to acquire subscribers from 92 countries in its first season.

A combination of linear and VOD solutions also allows the audience to access aired shows at their convenience.

Cloud-based platforms such as ViewLift offer a complete end-to-end solution to content owners to distribute and monetize their content across multiple device platforms, including web, mobile, over-the-top, connected TV, smart TVs and gaming consoles.

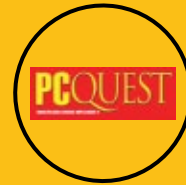
Top OTT platforms also provide deep real-time analytics for broadcasters to gauge viewer behavior constantly. For example, broadcasters can drive a personalized experience with recommendation engines that can decrease user churn, and create best-in-class experiences.

Adding OTT services to your linear broadcasting can attract new viewers, delight existing ones, and improve your appeal to advertisers. Embrace those opportunities, and simplify the process by aligning with the right technical partner. Over-the-top will become a powerful tool for your growth. 🍷

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Realising the dream of Connectivity and Growth for Rural India

India has some notable success stories in promoting rural connectivity. One example is Google India's Internet Saarthi programme (in partnership with Tata Trust)



BY PRAVEEN CHERIAN

What is common between Elastic Run, Meesho, Udaan and Dealshare?

Apart from the fact that they are Unicorns, these organisations have bet big on the rural India connectivity and commerce story. Urban elite studied the power of rural consumers mainly through the book 'Fortune at the bottom of the pyramid' by CK Prahalad but for long, this massive segment of almost a billion was ignored, even pilloried.

Covid pandemic recalibrated a lot of the status-quo across a shell-shocked world. One of them was organisations and institutions understanding the power of remote work and by extension, the importance of countrywide connectivity.

India has some notable success stories in promoting rural connectivity. One example is Google India's Internet Saarthi programme (in partnership with Tata Trust). This programme has benefited more than

India is at the cusp of a digital revolution and our government in partnership with telecom operators, service providers, regulators, industry, and academia has lined up several key initiatives to turbocharge India's rural connectivity at breakneck speed.

India's overall digital economy prowess has a direct impact on its share of Indian GDP. A world bank study shows that a 10% increase in broadband penetration translates to a 1.4% growth of GDP in the developing countries.

22 million rural women and due to which male vs female participation in rural connectivity has got somewhat normalised.

India is at the cusp of a digital revolution and our government in partnership with telecom operators, service providers, regulators, industry, and academia has lined up several key initiatives to turbocharge India's rural connectivity at breakneck speed. Some of them are outlined below:

- **Focus on Digital Infrastructure:** World's biggest rural broadband project Bharatnet has set up an ambitious target to provide fast, reliable, affordable, and scalable broadband access to all 2.5 Lakhs Gram Panchyats in the country through a mesh of interconnected OFC's spanning lakhs of kilometres to realise the vision of Digitally connected India. 1,77,550 Gram Panchayats (GPs) have been made service ready till June 2022. The scope of BharatNet has been extended up to all inhabited villages beyond GPs in the country by 2025.
- **Gigabit ambition:** Once the basic infra highway for internet access is laid, it's paramount that this highway is able to support fast bandwidth of rich data (Audio, video, streaming, LIVE calls etc) and this is where the National Broadband Mission (NBM) comes in. Imagine, entire rural India getting speeds of upto 50 Mbps (by 2024-25) which as of now we get in top urban cities in the country. NBM aims to bridge digital divide, accelerate the growth of digital communications infra, empower and facilitate digital empowerment & inclusion and provide unbiased, non-discriminatory, and universal access to broadband to all and sundry.
- **Enabling policies for fast 5G rollouts:** It's important to note that the recent changes done by the DoT to the ROW Act 2022 has been highly welcomed by everyone as that would ensure seamless, frictionless and uniform roll out of 5G services across the country through better coordination between all

the stakeholders for permission and deployment of digital infrastructure across the country.

India's overall digital economy prowess has a direct impact on its share of Indian GDP. A world bank study shows that a 10% increase in broadband penetration translates to a 1.4% growth of GDP in the developing countries. This data alone should be the harbinger of the exciting times ahead of us. In the last 5 years, Internet's contribution to our GDP increased from 5.6% to 16%

However, not all is as good as it looks. Even though the above parameters give a very utopian outlook of our Digital and Rural Connectivity story, there are, however, chinks in this shiny armour. Rural India internet usage is confined to browsing of social media platforms along with watching videos/listening to audios, however, most of the districts still lag far behind when it comes to online shopping, banking and digital payments - use cases that will take rural communities closer to parity. Government has been actively working to create a level playing field for our rural audience, however it needs to quickly address the following concerns on war footing to ensure we see a prosperous, connected and a fully empowered India.

Agile and ongoing addressal of Policy shortfalls
Cracking the code for scale and affordability for rural connectivity | Innovative approaches for overall digital and financial literacy

Our Ex-President and India's missile man – Dr APJ Abdul Kalam famously said: "Smart habitation is an area where cities and villages live and work in harmony and where the rural-urban divide has been reduced to a thin line"

The time has come for us to collectively realise this ideal.... 🙏

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What dropped at Google Cloud Next and Microsoft Ignite



BY DANIELLE ROYSTON

Google Cloud and Microsoft Azure went head-to-head with their annual events a couple of weeks ago. As they kicked off, I offered my take on which sessions were most relevant to telco. Now, I'm circling back through all the big announcements made by both companies to highlight the ones communication service providers will care about the most.

NEWS FROM NEXT

If you missed the event, you can catch up with this helpful 13-minute recap of the highlights. Here are the most notable nuggets.

T-MOBILE + GOOGLE CLOUD

The biggest telco headline to come out of Google Cloud Next is that T-Mobile has finally signed with a hyperscaler: Google Cloud. The partnership's initial focus will be improving customer experiences with data analytics, artificial intelligence (AI), and machine learning (ML). The teams will put T-Mobile's subscriber data to work to learn more about customers, predict usage trends, understand

customer sentiment, and find new business opportunities. T-Mobile is probably jealous of everything Vodafone's been doing through its partnership with Google Cloud—as every telco should be! You know I'm a big advocate for using the public cloud to enhance and personalize the subscriber experience; it's part of my vision for my company, Totogi. I'm definitely looking forward to seeing what T-Mobile and Google Cloud achieve.

GET A MOVE ON: DUAL RUN AND MIGRATION CENTER

Migrating to Google Cloud just got easier. Dual Run is a new service that'll help you move your mainframes to the public cloud. The press release says banks, retail, and healthcare have mainframes, but I know telco STILL has them, too. Now, there's help. The Migration Center is designed to help you assess and plan your move, and Database Migration Service helps with the actual migration. I love how hyperscalers are dipping down into reality to help telcos move data and workloads to the public cloud.

AN OPEN DATA CLOUD ECOSYSTEM

Back to what Vodafone and Google are doing with the telco's subscriber data—creating a single source of truth for the entire organization that can reduce costs, streamline operations, and bring new offerings to customers worldwide. You get why this is a big deal. Telcos are sitting on a goldmine of data that could improve customer service, identify new lines of business, and even tailor plans to individual subscribers. Google's open data cloud ecosystem helps you to aggregate and understand all your data from all sources in all storage formats from all cloud providers, so you can put it to work, apply AI and ML, make it more accessible, and get more insight from it. This is a huge benefit of moving to the public cloud, and the available tools keep getting better.

FIVE MORE NEW REGIONS ON THE WAY

Google Cloud is in a building frenzy! Already at 35 regions, with five opened this year and four more announced, it added another five to the list: Austria, Greece, Norway, South Africa, and Sweden. If not having a data center near you is keeping you from the public cloud, just wait a minute. There will be one (or more) in your backyard soon enough.

ITEMS FROM IGNITE

Microsoft didn't have much Ignite content specifically for the telco industry, but there's still plenty of good telco news that came out of the event.

ON THE EDGE: AZURE PUBLIC MULTI-ACCESS EDGE COMPUTE (MEC)

After launching Azure public MEC in preview last year, Microsoft made it generally available during Ignite. (The company's Azure private MEC launched last year.) This solution enables enterprises and developers to deliver high-performance, low-latency applications and experiences using operators' public 5G networks. It'll be available next month in Atlanta and Dallas, and "soon" in Detroit and NYC.

THE GRASS IS GREENER: DATABASE MIGRATION ASSESSMENT FOR ORACLE

There's a new database migration tool in town. Like Google Cloud and AWS, Azure is paving the way to leave your on-prem data center behind. The Database Migration Assessment for Oracle is an Azure Data Studio extension powered by Azure Database Migration Service that helps with the move from Oracle Database to Azure Database for PostgreSQL. It's in preview only right now, but should help Oracle customers cut costs and maintain performance. (If Amazon can get off Oracle, you can too!)

MORE METAVERSE

As Mark Zuckerberg announced at Meta Connect (also this week), the metaverse has legs—especially in the enterprise space. At Ignite, Microsoft echoed this sentiment in several ways. A 20-minute session called The Industrial Metaverse promoted the idea that there are three metaverses: consumer, commercial, and industrial.

- The consumer metaverse (where Meta fka Facebook is working, and Microsoft will go with Xbox) is all about entertainment and connecting in our personal lives. This is what usually comes to mind whenever someone says "Metaverse."
- The commercial metaverse is where Microsoft hopes to take Teams, and to that effect it used Ignite to announce Basic, Premium and Ultimate tiers; Mesh avatars; new features; and new apps. This was a sort of a womp-womp announcement; there are SO MANY ways to make the commercial metaverse experience better. Living through COVID and all the webcam fails we saw as people started to use them more than they ever had, surely we can do better than blurred backgrounds and cat filters.
- The industrial metaverse is where Microsoft says we can connect "the physical and digital world to help drive us forward in the world of industry." And there's a new business team, Industrial Metaverse Core, to help customers create immersive software interfaces to simulate and improve all kinds of industrial processes, as described here.

All that said, the metaverse—whatever form it ends up taking—is a very exciting opportunity for telco because there's no way any of it can work without your network. I'm not saying telcos need to solve the metaverse problem and build all their apps, but I think they should make their networks super open to it—and figure out how to monetize it (maybe charge by the API call, like DISH plans to do).

Honestly? I'm ready. If I could create an awesome, virtual-reality me, and be in India and Australia simultaneously, and skip a bunch of business travel, SIGN. ME. UP. That's a wrap on this year's Google Cloud Next and Microsoft Ignite. Next up, AWS re:Invent, running November 28 – December 2, 2022. 🍷

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Airtel announces ultrafast 5G connectivity on-the-go in Hyderabad

- Connects the entire corridor of the Hyderabad Metro Rail
- Secunderabad & Kacheguda railway station and Imlibun bus terminal are now live on Airtel 5G Plus

Bharti Airtel ("Airtel"), telecommunications services provider today announced the launch of its cutting edge 5G services in the city connecting key locations and transport hubs including the Metro Rail, Railway stations and the Bus terminal.

Hyderabadis can now enjoy ultra-fast 5G connectivity on the go while they travel in the Hyderabad Metro Rail. Commuters can also avail Airtel's 5G services at the Secunderabad & Kacheguda railway stations along with the Imlibun bus depot, Telangana's biggest inter-state bus terminal (ISBT).

In addition, customers can access Airtel 5G Plus in multiple locations in the city including Begumpet, Banjara Hills, Jubilee hills, Hi-tech City, Gachibowli, Bowenpally, Kompally, RTC Cross Roads, Koti, Malakpet, Charminar, Habsiguda, Uppal, Nagole, Kupatpally, Miyapur etc. Airtel is in the process of augmenting its network further making its services available across the city in due course of time.

Airtel 5G Plus works across all 5G phones and promises to give customers massive speeds and best voice experience. Customers who have 5G smart phones can now enjoy the high-speed Airtel 5G Plus on their existing data plans until the roll out is more widespread. No SIM change is needed as the existing Airtel 4G SIM is 5G enabled. The services are being rolled out in a phased manner as the company continues to construct its network.

Commenting on the launch, Shivan Bhargava, CEO, Bharti Airtel, Andhra Pradesh and Telangana said, "I am thrilled to announce the launch of Airtel 5G Plus in the city that will touch lives of millions of commuters every day as they commute using different modes of transport. Airtel customers can experience ultrafast network and enjoy speeds upto 20-30 times faster than the current 4G speeds while on the go. We are in the process of lighting up the entire city which will allow customers to enjoy superfast access to High-definition video streaming, gaming, multiple chatting, instant uploading of photos and more."

According to the telco, Airtel 5G Plus will bolster the entire portfolio of services that Airtel offers. In addition, it will allow superfast access to High Definition video streaming, gaming, multiple chatting, instant uploading of photos and more. With this launch, India will get a fillip to economic growth as Airtel 5G Plus revolutionizes education, healthcare, manufacturing, agriculture, mobility and logistics.

The telco also added that, in the last one year, Airtel has demonstrated the power of 5G with a host of powerful use cases that will change the way we lead our lives and do business. From India's first live 5G network in Hyderabad to India's first 5G powered hologram to India's first recreation of a game changing world cup match played at a time when there was no TV coverage to India's first 5G connected ambulance to India's first private 5G network with Bosch for boosting manufacturing productivity, Airtel has been at the forefront of 5G innovation.



5G to propel India's economic growth : Deloitte-CII report

- 90% of the consumers will be looking for a digitally enhanced shopping journey whether engaging at home, via mobile or inside a physical location
- Indian telecom industry to grow by US\$12.5 billion every three years; Market for AR/VR technologies likely to reach USD 1.634 billion (INR 13,070) crores by 2025.

With the advent of 5G and the potential to boost innovation across the globe, Deloitte India and CII in a report released today have projected the Indian telecom industry to grow by US\$12.5 billion every three years. India is all set to pave its path towards 'Atmanirbhar Bharat' as 5G will accelerate economic growth, increasing job opportunities and connecting the urban and rural population. It will drive efficiency in critical sectors, such as energy, healthcare, and agriculture, a step in the direction of not only commercial consideration but also social outcomes.

Together with ultra-low latency and high data rates, 5G is expected to create avenues of collaboration and alliances as well as drive India to re-imagine a whole new way of engaging in the new, faster, agile digital world. Newer trends will emerge like smartphones becoming bigger and slimmer, likely becoming more foldable or expandable. Given the embedded 5G hardware, technology will be seen summarizing the world in our hands via smartphones seamlessly bending reality into virtual reality.

Digital experiences will transform traditional shopping behaviours and the focus will be on providing enhanced customer experiences by combining the benefits of physical brick-and-mortar stores with immersive shopping platforms.

While telecom companies continue to strengthen their 5G capabilities and build a robust infrastructure, various state governments are gearing up for the adoption of 5G connectivity for good governance.

In addition, the allocation of spectrum licences to non-telecoms will help promote nonpublic captive networks which would not only yield benefits for major telecom and technology companies, but also strengthen India's start-up ecosystem, enabling them to operate as system integrators for enterprises and administer their 5G private networks. Deloitte expects a spurt in private network requirements in Indian industries once the benefits of the shift have been realised, ultimately solidifying the B2B enterprise telco story.

Peeyush Vaish, Partner and telecom sector leader, Deloitte India said "With the right mindset and technological prowess, the Indian Telecommunication Industry can use 5G to accelerate economic growth and

resilience in the country. 5G is also expected to empower organizations to act on rich datasets in realtime, offering unprecedented visibility, insights, and control over assets, products, and services. We also expect a surge in the requirement for private networks in Indian industries once they comprehend the benefits of shifting to 5G network."

He added, "While the current outlook for the Telecom sector looks stable, there is a need for telecom companies to revisit their strategies and keep pace with keep pace with new technologies and evolving marketplace. Apart from commercial benefits, 5G can also work as a growth propeller for Industry 4.0 by facilitating use of Information and communication technology (ICT) across sectors like manufacturing, education, healthcare, agriculture, finance and others. This will not only transform businesses in India but also create value for the society at large."

Key trends emerging include:

- **5G transforming ideas to reality:** 5G will cater to the rising need for high-end digital infrastructure required across all human experiences from entertainment to education and beyond. The increasing demand for immersive content across various industrial sectors such as healthcare, edTech, manufacturing and retail, among others will necessitate the high-speed 5G network as a driver for seamless connectivity within the ecosystem
- **Telecom Infrastructure: The 5G Footing:** Recent trends such as cloudification, orchestration, and virtualization are enabling extremely agile and scalable networks. A typical broadband and mobile network consists of several passive infrastructure components which combine to become a complete ecosystem forming the base for all deployments in the telecom sector
- **New smartphone market vs 5G uptake:** Demand for smartphones is anticipated to rise as internet usage increases; this demand will be fuelled by the requirement to adopt fintech, e-health, and e-learning
- **5G as a benison to Indian economy:** One of the direct economic benefits will come from the efficiency gains associated with operations, processing, and communications; all of which will contribute to cost reduction and improvement of margins
- **Ameliorating the 5G Ecosystem:** The approval of the Production Linked Incentive (PLI) schemes is expected to improve investor sentiment, attract more investment into India, stimulate innovation and R&D and reduce the significant imports of telecom equipment, thus demonstrating the government's commitment to its flagship programme, "Atmanirbhar Bharat"

Bharti Airtel launches its 5G services in Lucknow

Airtel's 5G services are currently operational in select locations in the city, including Gomti Nagar, Hazratganj, Aliganj, Aishbag, Rajajipuram, Aminabad, Jankipuram, Alambagh, and Vikas Nagar

Bharti Airtel announced the launch of its 5G services in Lucknow, the capital city of Uttar Pradesh today. Airtel 5G Plus services will be available to customers in Lucknow in a phased manner as the company continues to construct its network and complete the roll out.

Airtel's 5G services are currently operational in select locations in the city, including Gomti Nagar, Hazratganj, Aliganj, Aishbag, Rajajipuram, Aminabad, Jankipuram, Alambagh, and Vikas Nagar. "I am thrilled to announce the launch of Airtel 5G Plus in Lucknow. Airtel customers can now experience ultrafast network and enjoy speeds upto 20-30 times faster than the current 4G speeds. We are in the process of lighting up the entire city which will allow customers to enjoy superfast access to High-definition video streaming, gaming, multiple chatting, instant uploading of photos and more," said Sovan Mukherjee, CEO, Bharti Airtel in Uttar Pradesh.

Airtel has launched its 5G services in total 13 cities of India so far including Delhi, Mumbai, Bengaluru, Chennai, Hyderabad, Nagpur, Siliguri, Lucknow, Patna, Gurugram, Varanasi, Guwahati and Panipat.

Customers with 5G enabled devices will enjoy high speed Airtel 5G Plus network at no extra cost until the roll out is more widespread, the company said in a statement.



The company plans to expand its network to cover the entire city in the coming months.

The process to start using Airtel's 5G services is to first ensure that your device supports 5G network. Nearly all 5G-enabled smartphones now hold up Airtel's 5G. You need not change your SIM, just a prepaid 4G plan recharge on your 4G SIM is required, following which, as and when you're in Airtel's 5G network coverage zone, you will be able to access 5G services on your device.

BSNL 4G to be upgraded to 5G in 5 to 7 months, says Vaishnaw

In order for the telecom company to begin the trials for 5G services, BSNL has requested that Tata Consultancy Services (TCS) provide equipment for 5G testing.

In 5-7 months, the 1.35 lakh telecom towers held by the State-owned BSNL would have their 4G technology upgraded to 5G, according to Union telecom and railway minister Ashwini Vaishnaw. The minister stated during a CII event that the government intends to expand the telecom technology development fund from Rs 500 crore annually to Rs 4,000 crore in order to support domestic innovation.

According to a report by PTI, Uday Kotak CEO of Kotak Bank, asked Vaishnaw about the role of BSNL in the telecom industry. Vaishnaw responded that BSNL would play a significant stabilising role in the telecom industry.

According to him, BSNL has roughly 1,35,000 mobile

towers nationwide, with a significant presence in rural areas that are still not completely serviced by other telecom operators.

In order for the telecom company to begin the trials for 5G services, BSNL has requested that Tata Consultancy Services (TCS) provide equipment for 5G testing.

As stated in the PTI report, "We are taking that model to telecom space. A Telecom Technology Development Fund of Rs 500 crore every year has gotten established. We will be taking that to Rs 3,000-4,000 crore per year. That technology development fund will be available to the entire industry," Vaishnaw said.

OnePlus and Jio collaborate to bring Stand Alone True 5G tech ecosystem in India

First 1000 beneficiaries will additionally receive complementary Red Cable Care plan worth INR 1499 and Jio Saavn Pro plan worth INR 399



OnePlus, the global technology brand, collaborated with Jio, India's digital services player, claiming to bring in the evolutionary Stand Alone 5G technology ecosystem in India. Owing to the collaboration, all the OnePlus 5G devices will be powered by Jio True 5G technology.

OnePlus devices with access to Jio True 5G network from 1st December onwards include the latest OnePlus 10 Series, OnePlus 9R, OnePlus 8 Series as well as the Nord, Nord 2T, Nord 2, Nord CE, Nord CE 2 and Nord CE 2 Lite.

Similarly, OnePlus 9 Pro, OnePlus 9 and OnePlus 9RT will also have access to Jio True 5G network shortly.

According to the businesses, Jio and OnePlus teams have been actively working together at the backend to make 5G technology more accessible to Indian consumers and continue to expand their 5G technology services across the product portfolio.

As a part of the partnership, consumers will also be provided cashback benefits worth INR 10,800 which will be provided for eligible OnePlus and Jio 5G users during the OnePlus anniversary sale period from December 13th – December 18th.

First 1000 beneficiaries will additionally receive complementary Red Cable Care plan worth INR 1499 and Jio Saavn Pro plan worth INR 399.

Addressing the collaboration, Navnit Nakra, OnePlus India CEO and Head of India region, shared, "We are delighted to be partnering with Jio team to bring in 5G technology to our community in India. With 5G technology, users will enjoy a truly seamless, speedy internet experience, while achieving a lot more from

their daily use of smartphones than they could possibly imagine. With 5G becoming prevalent, OnePlus continues to demonstrate leadership in 5G R&D and has been the fastest in the industry to bring 5G devices to consumers across the globe. OnePlus launched the first line-up of 5G smartphones in 2020 in India, with the OnePlus 8 series in April 2020. Since then, all our smartphones are 5G-ready."

Speaking on the occasion, Sunil Dutt, President, Reliance Jio Infocomm Limited, said, "We are delighted to have OnePlus as a strategic partner to Jio, that has worked with us, to enable a sturdy 5G device ecosystem in India. The real power of a 5G smartphone can only be unleashed by a True 5G network like Jio, that is built as a Standalone 5G network, the most advanced network of its kind. Jio True 5G will enable hundreds of new and powerful experiences that can be experienced on a leading device like OnePlus. All Jio users using OnePlus devices will be able to access truly unlimited 5G internet under the Jio Welcome Offer in areas where Jio True 5G has or is being rolled out rapidly."

Indian consumers recently witnessed an innovative 5G collaboration between Jio and OnePlus at the renowned India Mobile Congress (IMC) in Delhi wherein exciting 5G use cases were successfully demonstrated to Jio users with eligible OnePlus devices.

According to OnePlus, it led the 5G smartphone market in the affordable premium segment (INR30K – 45K) as well as 20K-30K price segment in India, in terms of shipments, in Q3 2022 as per Counterpoint Research India smartphone model tracker Q3 2022.

Zero charge for SMS broadcast during disasters decides TRAI

The Telecom Regulatory Authority of India (TRAI) on Tuesday issued Telecom Tariff (69th amendment) order 2022 on Tariff for SMS and Cell Broadcast alerts disseminated through Common Alerting Protocol (CAP) platform during disasters/non-disasters.

Department of Telecom (DoT) requested TRAI to provide tariff for SMS and Cell Broadcast alerts/messages to be disseminated by TSPs through CAP platform during disasters/non-disasters.

DOT allows SMS/Cell Broadcast free of cost only for a definite period and for events where specific request for free-of-cost messages comes from NEC/NCMC/SEC/ Nodal Authorities. However, there are occasions when the government would like to send alert messages to the public forewarning of a possible disaster or occasions where the public has to be informed of special events such as holding of relief/vaccine/medical camps/specific law and order related situations etc.

Accordingly, as per extant practice, TRAI issued a Consultation Paper on “Tariff issues related to SMS and Cell Broadcast alerts disseminated through Common Alerting Protocol (CAP) platform during disasters/non-disasters” on November 3, 2021, seeking comments and counter comments from stakeholders by December 1, 2021 and December 15, 2021 respectively.

The Authority also conducted an Open House Discussion (OHD) through video-conferencing mode on the issues raised in the Consultation Paper.

After considering the views of all stakeholders/ participants and analysis thereof, the Authority inserted Schedule XIII to the principal Tariff order, in clause 3 of the Telecommunication Tariff Order, 1999, which provides the following Tariff for Short Message Services (SMS) and Cell Broadcast alerts disseminated by service providers through Common Alerting Protocol platform.

The Authority decided to prescribe a Tariff of Rs. 0.02 (paise two only) for SMS alerts/messages sent during disaster and non-disaster situations, other than those sent as per as per directions issued under the Disaster Management Act, 2005 (53 of 2005).

Considering the significance of alerts/messages sent as per direction issued under the Disaster Management Act, 2005 (53 of 2005), the Authority has decided that no charges shall be levied for such SMS/ Cell Broadcast – alerts/messages sent either during a disaster or prior to notification of disaster or after the expiry of disaster.

TRAI said TSPs shall broadcast messages to all the subscribers through Cell broadcast free of cost during disaster and non-disaster period. (ANI)



THIS **DECEMBER 2022**, DATAQUEST UNVEILED “**HOW INDIAN IT INDUSTRY BOUNCED BACK AFTER PANDEMIC ERA**” IN ITS ANNUAL DQTOP20 EDITION.

Dataquest also unveiled the much awaited Dataquest-CMR Digital Index Survey 2022.

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MediaTek unveils Dimensity 8200, chipset for premium 5G smartphones



MediaTek today announced the Dimensity 8200, the company's newest chipset for premium 5G smartphones. Smartphones powered by the Dimensity 8200 are claimed to offer flagship level experiences – including connectivity, gaming, multimedia, displays and imaging – at a more accessible price point. Built on the 4nm-class process, the new chipset delivers unparalleled power efficiency. It also integrates an octa-core CPU with four Arm Cortex-A78 cores operating at up to 3.1 GHz, along with a powerful Mali-G610 graphics engine, for better performance across applications, according to MediaTek.

According to the company, to enhance gaming performance, the chipset takes advantage of MediaTek's HyperEngine 6.0 gaming technologies so users can enjoy smooth high framerate gameplay without suffering connection drops, FPS jitter, or gameplay hiccups. MediaTek's Intelligent Display Sync 2.0 technology intelligently adjusts the display refresh rate according to the game frame rate detected, which helps provide smoother viewing experiences.

"The MediaTek Dimensity 8200 will enhance the gaming experience on premium 5G smartphones, and will deliver smoother gameplay with higher framerates, impressive graphics, and seamless connectivity," said CH Chen, Deputy General Manager of MediaTek's Wireless Communications Business Unit. "Plus, the Dimensity 8200's power efficiency enhancements make it so consumers don't have to sacrifice battery life to enjoy super high performance," he added.

Powered by a flagship-level Imagiq 785 ISP, the Dimensity 8200 is capable of supporting 320MP photos and capturing true-to-life 14-bit HDR video on up to three cameras simultaneously, and recording cinematic video by double camera capture for the most natural bokeh effect. The chipset also has exceptionally fast AI-noise reduction to retain fine details, particularly in low-light environments.

The fully integrated 5G modem in the Dimensity 8200 features the latest 3GPP Release-16 standard technology and 3CC carrier aggregation to amplify sub-6GHz performance. The chipset also supports tri-band Wi-Fi 6E for faster wireless connectivity, while the 2x2 antenna ensures improved performance and connection reliability.

Additional features of the Dimensity 8200 include:

- Powerful AI processing unit to maximize the efficiency of dedicated AI tasks and fusion processing.
- Ultra-efficient Vulkan SDK to provide faster and more effective ray tracing effects.
- Support for brilliant 120Hz WQHD+ and 180Hz Full HD+ displays.
- Immersive viewing experiences with HDR10+ Adaptive support, 4K AV1 media decoding, and AI SDR-to-HDR video playback.
- Incredible audio quality with Bluetooth LE Audio technology and Dual-Link True Wireless Stereo Audio.
- Dimensity 8200 will power 5G devices launching in the global market starting in December 2022.

Princeton Digital Group launches flagship data center in Mumbai

MU1 will be powered up to 40% by renewable energy and will operate on minimal water consumption

Princeton Digital Group (PDG), data center provider for Asia, launched its flagship data center (MU1) in India today. Its MU1 data center provides 48 MW of critical IT capacity across two buildings and has achieved the rare feat of IGBC Platinum certification, according to PGD. With an investment of USD 300 million, MU1 is reportedly built across six acres within a larger IT campus at Airoli, Navi Mumbai. The campus will deliver secure and scalable data center capacity to hyperscalers – large cloud, content, commerce and fintech companies.

According to the company, in line with PDG's vision to be the most progressive data center player in the region in sustainability, MU1 will be powered up to 40% by renewable energy and will operate on minimal water consumption. In addition to achieving IGBC Platinum certification, which is the highest standard of Green Buildings Certification, MU1 is claimed to be the first Open Compute Project (OCP) certified data center in the country and will also be an Uptime Tier III certified facility.

Commenting on the launch, Rangu Salgame, Chairman, Chief Executive Officer and Co-Founder of PDG said, "India is one of the fastest growing data center markets in the world today and is a key focus market for PDG. We are committed to delivering hyperscale grade capacity at global standards to our customers in India. The launch of MU1 further strengthens our position as a leading Pan-Asia datacenter operator, that is focused on

creating sustainable value and being an enabler of digital growth. Our continued track record of delivering on our commitments is a key factor that makes PDG the partner of choice for hyperscalers across Asia Pacific."

Established in 2017, PDG is Asia's hyperscale datacenter market with presence in five countries with a portfolio of 20 data centers and 600 MW capacity. PDG also claimed to have a solid growth pipeline to establish more data centers in India, to serve the country with highly secure, scalable, and sustainable services and solutions, across multiple cities.

"The demand for data centers has accelerated rapidly, driven by large-scale cloud adoption, enhanced Internet penetration and extensive digital transformation. Our MU1 data center provides state-of-the-art internet infrastructure, designed to meet mission critical requirements. With a formidable team of highly experienced data center professionals, PDG has ambitious plans to scale and expand across India and is also committed to the cause of grooming young engineering talent into leaders of tomorrow," said Vipin Shirsat, Managing Director, India, PDG.

PDG said it is expanding rapidly across Asia, with several projects under construction. The company is backed by blue-chip institutional investment firms, Warburg Pincus, Ontario Teachers' Pension Plan (OTPP) and Mubadala Investment Company (Mubadala).



DoT proposes to drop Bharatnet infra from its asset monetisation plan

According to the NMP document, 5,25,706 kilometres of optical fibre has been laid under Bharatnet project which aims to connect all villages in the country with a high-speed broadband network

The Department of Telecommunications (DoT) has proposed not to monetize rural broadband network infrastructure built under Bharatnet project and plans to replace it with alternate assets to achieve its target fixed under the National Monetisation Pipeline (NMP), sources said. Sources also told PTI that BSNL tower monetisation bid launch will be targeted within FY22-23. According to sources, the earlier attempt to monetise the asset under Bharatnet failed to get satisfactory response from private players. "Bid response under PPP (public-private partnership) mode was not satisfactory," the source said.

DoT under the ministry of communications has so far not raised any money through asset monetisation against the target of Rs 20,180 crore in the current financial year. An e-mail sent to DoT seeking comments remained unanswered.

According to the NMP document, 5,25,706 kilometres of optical fibre has been laid under Bharatnet project which aims to connect all villages in the country with a high-speed broadband network. The indicative monetisation value for Bharatnet fibre assets is considered based on a capex approach, sources added.

Earlier the scope of the project was limited to 2.5 lakh panchayats, which has now been extended to village level. In the first phase of telecom asset monetisation proposed in FY23, the NMP estimates to realise Rs 20,180 crore, which includes Rs 15,780 crore from Bharatnet fibre and Rs 4,400 crore from mobile tower sale.

According to the document, BSNL's 13,567 mobile tower assets and MTNL's 1,350 towers have been valued at Rs 8,800 crore. Both the public sector units jointly own 69,047 mobile towers. The government has monetised assets worth Rs 33,422 crore under the National Monetisation Pipeline (NMP) in 2022-23 so far.

(PTI Report)

Swisscom launches 5G FWA services for business clients

Swisscom is utilizing 5G Mobile Access to improve the fixed network architecture and expand the accessibility of ultra-broadband with up to 1 Gbps of bandwidth

A 5G fixed wireless access (FWA) solution has been introduced by Swiss full-service provider Swisscom. Customers of Swisscom Business can now use the 5G FWA services that were made available by the telecom company last week. B2B customers can now install a fixed internet connection utilising 5G technology at their corporate facilities due to Swisscom's 5G Fixed Wireless Access Services.

Using 5G wireless technologies, this solution enables business clients without fixed-line connection to connect to their corporate network.

According to the business, Swisscom is making the fastest internet accessible to business customers in locations of temporary business sites and in places where normal network expansion is not possible with the help of this solution.

Friederike Hoffmann, Head of Connected Business Solutions at Swisscom said: "5G FWA offers great potential for our business customers. They can use it to benefit from the fastest Internet at their sites and be ready to make full use of all services."

Swisscom is utilizing 5G Mobile Access to improve the fixed network architecture and expand the accessibility of ultra-broadband with up to 1 Gbps of bandwidth. 5G FWA serves as a failover (backup) with added security of a mobile network connection for the Internet connection supplied by a copper or fibre optic link. As a result, the 5G FWA solution can serve as a 5G mobile backup. Mobile coverage, either 5G or 4G, is necessary for 5G FWA.

The Mobile Access and Backup service utilises a tiny receiver, or Customer Premises Equipment, or CPE. An external 5G SIM card is put in the Nokia 5G Mobile Toolkit, which also supports 4G. The Swisscom network is accessible wirelessly thanks to the toolkit's connection to the mobile communication tower. Customers in the business world have the choice of using 5G FWA with Enterprise Connect as a 5G Mobile Backup or 5G Mobile Access solution. The 100-meter cable used by the 5G Mobile Toolkit is available.

This December 2022, PCQuest unveiled “Most recognised brands in its annual ENTERPRISE CHOICE AWARD 2022 - Volume 2”



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Spirent introduces SimORBIT solution for LEO satellite simulation

Industry-first SimORBIT solution provides high-level accuracy for Low Earth Orbit satellite simulation



Spirent Communications, provider of test and assurance solutions for next-generation devices and networks, today announced availability of SimORBIT, the first high-accuracy orbital modelling software solution specifically developed for Low Earth Orbit (LEO) satellite simulation. Created in partnership with space-borne receiver developer SpacePNT, Spirent SimORBIT enables developers to calculate LEO orbits and their distinctive characteristics more precisely and realistically for GNSS/PNT testing.

Testing space-based applications in the field is extremely difficult and cost prohibitive, which is why accurate lab testing is vital. The new era of LEO satellites demands highly accurate modelling of the Low Earth Orbit environment to provide the realism needed for high-value testing, including representing the distinct gravitational and atmospheric impact LEO satellites will endure in space. Using Spirent's SimORBIT model, developers can now accurately replicate LEO orbits for the first time, enabling customers to test using simulations that more closely resemble the true operating environment of a LEO satellite, according to the company.

"Until now, PNT testing on LEO applications has been limited due to the lack of an integrated solution that could offer realistic LEO orbital data together with GNSS simulation capabilities," explained Adam Price,

Spirent's Vice President of PNT Simulation. "By working in close collaboration with SpacePNT, we have been able to develop the SimORBIT tool to bring a new level of accuracy and realism to LEO application testing by combining the simulation of precise LEO orbits and highly accurate GNSS signals," he added.

This capability complements the ability of Spirent's simulation systems to generate non-ICD signals via I/Q injection, or by the unique Spirent "Flex" feature, enabling new space based PNT signals to be developed in the lab as realistically as possible.

"As a leader in LEO PNT technology, we at SpacePNT are always keen to partner with other industry market leaders such as Spirent for the testing of PNT technology," said CEO and Founder, Cyril Botteron. "Spirent's open and rich PNT simulation environment has made the collaboration seamless, and we are proud to offer such a new, innovative building block for this rapidly emerging key PNT technology," he further added.

Spirent provides the most comprehensive and realistic GNSS test environments, working with leading PNT players to deliver the flexible, scalable, and future-proof architecture needed to evolve with technology. The SimORBIT orbital model highlights the company's continued commitment to providing customers with the most realistic, most valuable solutions for testing space-based applications, stated the businesses.

Airtel launches 'World Pass' – One pack for travel across 184 countries

- Significantly higher value in terms of data and voice benefits. More economical even compared to local connections abroad
- 24/7 call centre support on call and WhatsApp chat
- Unlimited data for emergency usage and messaging applications
- Power to Manage everything yourself on the Airtel Thanks app

In order to make staying connected easy, intuitive and compelling, Airtel has launched 'Airtel World Pass'. The telco said that, The World Pass revolutionizes the experience for all international travel because it works seamlessly across 184 countries. So even if you are en-route at an Airport or travelling to two or more countries one pack now covers all your roaming needs.

Airtel said that the worst effects of the COVID-19 pandemic ebb, we are beginning to witness a massive surge in international travel both for work and leisure. India, in fact, has seen a jump of 3X in international travellers this year, which is likely to double next year.

This change comes on the back of extensive customer research conducted by Airtel that showed that many customers find International Roaming packs in general confusing across the whole global Telco industry, according to the business. As a result, many are not connected when they want to be. Or they seek complex alternatives of temporary connections abroad. Airtel has now solved this problem structurally with the launch of the Airtel World pass.

Commenting on the launch of the Airtel World Pass, Shashwat Sharma, Director Consumer Business, Bharti Airtel said, "At Airtel, our mission is to solve customer problems so that our experience speaks for itself. The feedback that we have heard on international travel related concerns has compelled us to launch a defining proposition for our customers – the Airtel World Pass. This offers our customers one pack for the globe, significantly greater value, allows them to control what they use on the app and allows for emergency data usage long after the pack allowance is over."

"With Airtel World pass, we have set a new standard in the global telecom industry. I am certain our customers will benefit hugely from it as they travel the world, keeping their phones switched on, no matter where they



are. As a matter of fact, our new plans offer significantly better value than travel or local sims in most countries." Sharma added.

Airtel World Pass – Key Features Include

One Plan for travel to 184 countries. No confusion over which zone or pack to select. No need for multiple packs across multiple countries or transit airports

24X7 Call centre support for the customer from any corner of the world, absolutely free of cost. A dedicated number 99100-99100 available on call and WhatsApp for all international travelling customer, serviced with a network and experience specialist squad for a real-time resolution of issues.

Special Packs for long stay/frequent travellers – Prepaid and postpaid packs specifically designed for frequent travellers and long stay customers that offer up to 1 year validity at an affordable cost.

Plans packed with significantly higher value for customers. In addition, customers will have Unlimited data available for emergency usage and messaging applications.

All control in the customers hand where they can manage their entire International roaming needs on the Airtel Thanks app, with updates on usage, billing amount or addition of data or minutes as needed.

Details of the Airtel World Pass are below for both Postpaid and Prepaid customers

Airtel collaborates with Meta to expedite India's digital ecosystem

Airtel has signed an agreement to help increase operational efficiency of Open RAN and facilitate energy management and automation in radio networks using advanced analytics and AI/ML models

Bharti Airtel ("Airtel"), digital communications solutions provider, and Meta Platforms, ("Meta") today announced a collaboration to support the growth of India's digital ecosystem. Airtel and Meta will jointly invest in global connectivity infrastructure and CPaaS based new-age digital solutions to support the emerging requirements of customers and enterprises in India.

Airtel mentioned that foundational connectivity infrastructure such as subsea cable systems are crucial for supporting the rising demand for high-speed data and digital services as India prepares to roll out 5G networks later this year. With the constant endeavor to augment the nation's infrastructure, Airtel will partner with Meta and STC to extend 2Africa Pearls to India. According to the telco, 2Africa is the world's longest subsea cable system and is expected to provide faster internet connectivity to almost 3 billion people globally. Airtel and Meta will extend the cable to Airtel's landing station in Mumbai and also pick up dedicated capacity to further strengthen its submarine network portfolio. The 2Africa cable will significantly boost India's cable capacity and empower global hyper-scalers and businesses to build new integrated solutions and provide a high-quality seamless experience to customers, stated the business.

As members of the Telecom Infra Project (TIP) Open RAN project group, Airtel and Meta have been pioneers of Open RAN technologies with the shared goal of increasing ecosystem diversity, driving innovation, and cost-efficiency in connectivity networks. According to Airtel, it has signed an agreement to help increase operational efficiency of Open RAN and facilitate energy management and automation in radio networks using advanced analytics and AI/ML models. Airtel also informed that it is currently conducting trials for 4G and 5G Open RAN solutions on select sites in the state of Haryana and will commercially deploy the solution across several locations in India over the next few quarters. Airtel will share its learning with wider ecosystem partners within the TIP community, including Meta, to help accelerate the deployment of Open RAN based networks across the world.

Businesses in India are rapidly shifting to cloud-based solutions to serve their customers digitally. As per the telco, Airtel IQ, the world's first network embedded



Communications Platform as a Service (CPaaS) ecosystem, offers cloud communication across voice, messaging and video channels to help enterprises transform their customer engagement and drive profitability by leveraging automation and boosting revenue. Airtel informed that it will integrate Meta's WhatsApp within its CPaaS platform. With this integration, businesses will now be able to use WhatsApp's rich features and reach to provide an unparalleled omni-channel customer engagement to enterprises.

Vani Venkatesh, CEO – Global Business, Bharti Airtel said: "We, at Airtel, are delighted to deepen our partnership with Meta to serve India's digitally connected economy by leveraging the technology and infrastructure strengths of both companies. With our contributions to the 2Africa cable and Open RAN, we are investing in crucial and progressive connectivity infrastructure which is needed to support the increasing demand for high-speed data in India. We look forward to working closely with Meta to deliver best-in-class digital experiences to our customers in India."

Francisco Varela, vice president of mobile partnerships for Meta said: "Subsea cables and open, disaggregated networks continue to play a huge role in the foundational infrastructure needed to support network capacity and fuel innovation. We look forward to continuing our collaboration with Airtel to further advance the region's connectivity infrastructure that will enable a better network experience for people and businesses across India."

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DigiYatra makes paperless entry possible at 3 airports

DigiYatra is a facial recognition app designed to make checking in for flights easier for travellers. Passengers must first install the DigiYatra app which can be downloaded on the smartphones

To simplify air travel, the government has implemented paperless entry at a few airports beginning this Thursday. Union Minister for Civil Aviation Jyotiraditya Scindia on Thursday launched Digi Yatra from the Indira Gandhi International Airport, New Delhi, for three airports in the country.

As a part of this programme, facial recognition software dubbed “DigiYatra” will be used at airports to verify identity. As a result, customers would not need to carry both their ID and boarding permit.

The programme will be introduced at seven airports in its initial phase, beginning with three, Delhi, Bengaluru and Varanasi and then moving moving on to the remaining four, Hyderabad, Kolkata, Pune and Vijaywada by March 2023. The technology will then be introduced all around the nation.

In August, GMR group-owned Delhi International Airport Limited (DIAL), a joint venture, formed as a conglomerate between GMR Group (54%), Airports Authority of India (26%), and Fraport AG & Eraman Malaysia (10% each) announced the launch of the centre’s DigiYatra programme, by releasing the application’s beta version for Android platforms. The necessary infrastructure is already in place at Terminal 3 of the Delhi Airport, whereas other airports are also putting it in place.

How does DigiYatra operate and what is it?

DigiYatra is a facial recognition app designed to make checking in for flights easier for travellers. Passengers must first install the DigiYatra app which can be downloaded on the smartphones. It is available for both iOS and Android smartphones. Passengers can check in using this app without needing a boarding pass in paper form. The travellers would also be able to drop off their checked bags in addition to checking in. As stated, the purpose of DigiYatra is to make passengers’ experience of flying rapid and flawless.

Currently this service is only available to passengers of Air India, IndiGo, and Vistara. Spicejet is expected to support the project soon. All travelers taking domestic flights on the aforementioned airlines at the airports of Delhi, Bengaluru, and Varanasi can now check in easily using DigiYatra.

How can users access the DigiYatra service?

A traveller must register their information on the DigiYatra App utilising Aadhaar-based validation and a self picture capture in order to use this service. The following step requires you to scan the boarding pass, and the credentials must be provided to airport officials.



COAI releases statement on misleading views in media on OTTs

Communication OTTs do not contribute to the exchequer in the form of taxes, levies, license fee, etc. as they are not presently regulated by the Ministry of Communications, although their services are similar to that provided by the telcos. Hence, the definition of OTT Communication services need to be clearly incorporated in the Telecommunication Act itself, added COAI in its statement.

There are misleading views being propagated in the media by Big Tech advocates basis the legitimate demand of the TSPs seeking a 'usage charge' from OTTs that ride on their networks to provide competitive services like voice/video calling and messaging to the same consumers, according to Cellular Operations Association of India (COAI).

The statement further read that, it is being said that the revenues earned by the infrastructure provider should also be shared with the entity using it in the same proportion. This is as ludicrous a suggestion as can be imagined. By a very simple analogy, telecom networks are akin to roadways whereon the services for public consumption – such as public transport vehicles like buses operate, similar to the OTT service providers. The passengers or users of the service pay for ride tickets on roads or similarly for data packs to avail digital services. Notably, the vehicles pay toll/road taxes for using the roadways which contributes towards its maintenance and upkeep. The outrageous suggestion of roads paying to the vehicles for getting passengers on their network is unheard of. OTTs though, are not paying anything to the TSPs presently for their network costs.

Besides cannibalizing the services of the telecom operators, OTTs consume humongous bandwidth, which stresses the telcos' networks and necessitates their continuous and speedy up-gradation and development. This is in addition to the fact that TSPs' networks are already overstretched due to the growing volume of mobile and fixed broadband traffic, and also need to be expanded continuously to cover the connectivity requirements across the country and cope up with the exponential usage growth. Needless to mention, this expansion also involves deployment of latest technologies for better customer experience. In fact, the quality of service cannot be downgraded by the TSPs as the same is regulated by TRAI to ensure good services to the customers unlike OTTs, who may upgrade/downgrade their services since they have no QoS obligations.

OTT players are 'free riding' on the TSPs' Networks while using the TSPs' consumer base for monetizing their services and earning massive profits/benefits.



TSPs have contributed an amount of approx. Rs. 17,627 Cr. towards License Fee and Rs. 7,073 Cr. towards SUC for the FY 2021-22 alone. This is besides the mammoth amounts invested towards spectrum acquisition and network infrastructure. OTTs on the other hand, have nil or very minuscule contributions to the Government despite their robust revenues. Communication OTTs do not contribute to the exchequer in the form of taxes, levies, license fee, etc. as they are not presently regulated by the Ministry of Communications, although their services are similar to that provided by the telcos. Hence, the definition of OTT Communication services need to be clearly incorporated in the Telecommunication Act itself, added COAI in its statement.

It is also being argued that OTTs invest substantially on data centers, undersea cables, content hosting centers, content delivery networks, etc., which is greater than the TSPs' network costs and investments. This is another flawed comparison, and it is misdirecting to suggest that TSPs do not invest to the same extent. In fact, apart from the telecom network (on land), Indian TSPs too have invested heavily in laying of Undersea Cables for setting up their international network connectivity.

A dated report from the European Telecom Regulator BEREC is being quoted selectively, expressing concern that direct compensation from content and applications

like OTTs could endanger the principle of net neutrality. In actuality, TSPs can neither provide bandwidth boost to OTTs, nor throttle/block their services by choice to save bandwidth, owing to the conditions inscribed in their license. The telcos demand for usage charge is proposed to be uniformly applied based on actual usage of the network by the OTTs.

Keeping in mind the need to nurture startups and MSMEs in the OTT ecosystem, COAI has also suggested that such players with low usage need not be required to pay the usage charge, so as to aid their growth. So, innovation and entrepreneurship would not get affected.

The COAI proposal will meet the objectives of adequate funding for creating robust telecom infrastructure, increased revenue for the exchequer and continued

innovation as only large OTTs generating high traffic would be required to contribute via usage charge, without impacting small OTTs and retail users.

The fact that economies across the world are advocating the need for OTTs (majorly owned by Global Tech giants) to contribute towards digital infrastructure development cannot be undermined. India has set global precedents in taking forward-looking and prudent decisions keeping in mind the well-being of both consumers and the industry in the long-term. As rapid technological evolution may pose similar policy challenges going forward, appropriate provisions must be made to ensure that the policy, regulatory and security mandates of the nation do not get compromised or become discriminatory in any manner.

Amantya Technologies exhibits 5G VoNR from its 5G lab in Gurgaon

5G VoNR was made by emulating an end-to-end live 5G environment using Amantya's in-house Standalone (SA) 5G Core Network, RAN solution, and IMS Server, and is claimed to be a huge 5G milestone for the company.

Global product engineering and system integration company, Amantya Technologies announced that it has successfully demonstrated 5G Voice over New Radio (VoNR) call from its state-of-the-art 5G Lab in Gurgaon, India.

This is claimed to be another significant breakthrough in the company's rapidly growing 5G solutions portfolio. Amantya's previous launches include avant-garde 5G solutions and IP accelerators including Astra5G, an end-to-end Enterprise 5G solution, 5G Network-in-a-Box (for building fully functional 5G Labs), and Standalone 5G Core.

Sanjay Bisen, CTO of Amantya Technologies said, "The successful demonstration of 5G VoNR call is a significant step forward for Amantya's growing 5G capabilities. With this, we hope to offer our customers high-definition and seamless voice and video experiences over 5G and several advanced voice applications and use cases. It will help supercharge macro-level and enterprise 5G deployments and creating 5G testing & simulation environments. Such breakthroughs are powerful affirmatives for our team and motivate us to go full steam ahead in exploring the true potential of 5G and take it to our customers across the globe."

According to the business, 5G VoNR was made by emulating an end-to-end live 5G environment using Amantya's in-house Standalone (SA) 5G Core Network, RAN solution, and IMS Server, and is claimed to be a huge



5G milestone for the company. While the key benefit of VoNR is ultra-high definition of the call, 5G VoNR also provides an integration point with applications and content such as announcement and conferencing. Additionally, it also supports integration with Rich Communication Services (RCS) in the IMS server. By demonstrating its 5G VoNR capabilities, Amantya can now provide complete IMS integration and various new services offered over the IMS network in 5G core infrastructure.

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“BECOMING SELF-SUFFICIENT IN SEMICONDUCTORS MAY TAKE SOME TIME”

S. KRISHNANSECRETARY, MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY,
GOVERNMENT OF INDIA

TAKING FLIGHT: INDIA'S DATA CENTRES IN 2024

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MAKING DATA CENTRES A
KEY DRIVER OF GROWTH AND
ATTRACTING MASSIVE TECH
INVESTMENTS

USHERING IN THE ERA OF INDIAN TELECOM RESURGENCE

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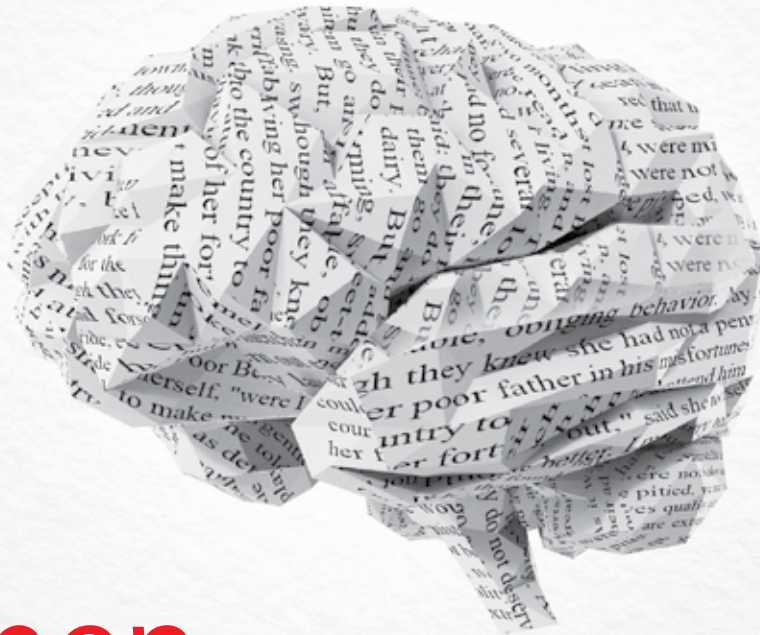
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January 2024

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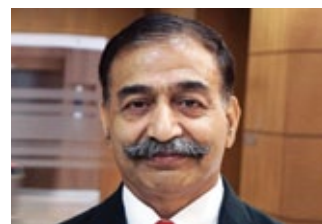
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ISSUE

THE GROWING UPI SCAMS



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SHUBHENDU
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[OPENING NOTE]

Propelling India to leadership in telecom equipment manufacturing

India's ascent in telecom equipment manufacturing, solidifying its global supplier status, is underscored by a remarkable 133% surge in exports, soaring from Rs 41,561 crore in 2020-21 to Rs 96,816 crore in 2022-23. Simultaneously, imports rose by 11.67%, reaching Rs 1,34,000 crore during the same period. These figures underscore global acceptance of India's quality products and highlight domestic market potential.

Against this backdrop, the decision by the Telecommunication Engineering Centre (TEC) to expand the Simplified Certification Scheme (SCS) product list, effective from 1 January 2024, is pivotal for fostering indigenous manufacturing and enhancing the ease of doing business in the sector. TEC, an agency under the Department of Telecommunications, plays a vital role in certifying telecom products and shaping the sector's future through technological forecasting and envisioning next-gen network elements.

The SCS, tailored for Group A equipment, revolutionises the certification process. Under this scheme, applicants can now submit a test-wise compliance sheet and a Self-Declaration of Conformity (SDoC) for parameters in Essential Requirements (ERs). This departure from the traditional model, where test reports from Conformity Assessment Bodies were mandatory, streamlines and expedites certification.

According to a Ministry of Communication press release, the expansion of the scheme aims to slash the certification timeline from eight weeks to a mere two weeks. This reduction in processing time aligns well with the broader governmental vision of promoting a more agile and responsive business ecosystem.

The addition of 37 products under the SCS spans a broad spectrum, from media gateways and IP security equipment to optical fibre or cable and transmission terminal equipment. This expansion elevates the total number of products covered under the SCS from 12 to 49, offering a more comprehensive scope for businesses seeking certification.

An applaudable facet of this initiative is the revised fee structure, wherein TEC will only charge an administrative fee for ER-based applications submitted under the Mandatory Testing and Certification of Telecom Equipment or MTCTE regime. Notably, the TEC has taken a customer-friendly approach by waiving the evaluation fee, a gesture that has been warmly received by OEMs and applicants alike.

The streamlined process and reduced certification timeline are expected to stimulate innovation by allowing certified products to reach the market faster. This forward-thinking approach not only benefits businesses but also positions India as a more attractive destination for telecom equipment manufacturing and certification.

TEC's decision to embrace change and simplify the certification process underscores India's commitment to creating a conducive environment for local manufacturing. As the country navigates the complexities of telecom equipment manufacturing, this move serves as a beacon, guiding towards a future where efficiency, innovation, and business success converge. Additionally, it helps India address the 4% 'cost disability' compared to China and Vietnam due to higher manufacturing costs, as highlighted in a recent TRAI report.

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Transforming urban living and citizen experiences

Town planners and administrators must utilise new technologies to build a future-ready network infrastructure that allows them to make cities smarter



BY AMIT MALIK

Over the last few years, India has adopted several initiatives to improve its urban infrastructure and enhance the quality of life for city dwellers. The growing influx of people from rural to urban areas and the need to modernise the existing infrastructure are the key reasons for this.

As the urban population continues to grow, municipal infrastructure such as power grids, water systems, and transportation networks struggle to keep up. According to the government's projections, 597 million people will reside in Indian cities by 2036, with the existing infrastructure inadequate to address this exponential growth in the urban population.

Realising that smart cities can help improve the quality of urban life sustainably and also better manage future

growth, India launched the Smart Cities Mission in 2015. The project aims to use technology solutions to improve the quality of life of citizens in 100 towns and cities.

Creating a smart city – one that is connected and automated wherever possible via a strong, secure communication network is no easy task. It requires an extensive system of sensors, device analytics, and data centres designed to maximise the use of available resources to improve the quality of life for city dwellers. Well-planned smart cities offer significant benefits to authorities as well as residents. While they empower the administration to easily and better manage the infrastructure, city dwellers benefit from improved and sustainable government services including healthcare, education, transportation, energy and public safety, among others, and prompt response from the administration.

A smart city requires a highly reliable network that allows the city management to introduce new technologies quickly and at scale.

ADAPTIVE NETWORKS FOR SMART CITIES

Creating a smart city is no easy task. For instance, the Smart Cities Mission includes up to 7,800 projects, of which 5,700 have been completed with the remainder likely to be done by mid-2024. Initially, most smart city projects focused on specific applications, such as smart lighting or traffic management, managed by individual agencies.

However, the concept has evolved with several technologies and agencies working in tandem to maximise the benefits. Data generated from the projects needs to be shared between agencies so it can be used for better management and to ensure an improved experience for citizens. It now requires a more converged connectivity platform, enabling easy sharing of data between all the stakeholders.

In addition, a smart city also uses Artificial Intelligence (AI) and Machine Learning (ML) to gain actionable and real-time insights from the data. This allows city administration to quickly resolve a problem or proactively address a situation even before it starts to impact the citizens.

Through the Smart Cities Mission, Integrated Command and Control Centres (ICCC) were set up across India. For example, the Srinagar ICCC has been integrated with the 'mySrinagar' Smart City mobile application, providing a one-stop solution for citizens and tourists in Srinagar, to quickly access digital services for day-to-day civic life within the city, and for effective disaster management. Technology has been adopted to monitor water levels and rainfall collection, and the data collected to make predictions about the likelihood of a flood. Now, before any heavy rainfall or snowfall, citizens in Srinagar are alerted through the application.

Such smart city applications use data and bandwidth-intensive technologies that require network flexibility and agility. A smart city requires a highly reliable network that allows the city management to introduce new technologies quickly and at scale. This is crucial because the demands from city infrastructure are constantly

evolving and the administration should be able to meet them quickly and easily.

An adaptive network that offers a combination of network intelligence, software control and automation and programmable infrastructure would help city administration to address these needs. Analytics and intent-based policies of adaptive networks allow city management to scale rapidly while self-configuring and self-optimising by regularly evaluating network pressure and demands.

MEETING HIGH-BANDWIDTH NEEDS

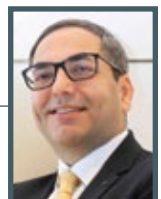
The growing number of smart city initiatives in India requires a programmable network that can address the requirement for fluctuations in bandwidth, traffic prioritisation and avoidance of network congestion and outages. This is a challenge for most service providers as identifying the root cause and resolving service issues across multi-layer networks in real-time using conventional service assurance tools could take significant time and effort. This negatively impacts business productivity and increases operational expenses, not to mention violation of the Service Level Agreements and customer churn.

A unified, automated approach that simplifies service assurance across multi-layer networks helps in quick identification and resolution of the problem's root cause. This can be addressed by integrating intelligent automation platforms that can analyse alarms and alerts across network infrastructure and in case of a direct relationship, swiftly identify the problem. This approach helps in bringing down the time to resolution thus ensuring improved customer satisfaction.

Smart cities must utilise new technologies to build a future-ready network infrastructure that allows them to make a city smarter and truly enrich the lives of citizens in urban spaces. 🌆

*The author is Vice President and Sales
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Striking a balance or walking a tightrope?

India's recently passed Telecom Bill has been appreciated for its futuristic approach. However, it still leaves some issues open



BY VERNIKA AWAL

On Christmas Eve, the Telecom Bill 2023 received the assent of President Droupadi Murmu, thereby making it into law. Now an Act impending its ongoing rule-making process, the new law for the mammoth telecommunications sector has been hailed in specific areas for fruitfully modernising various aspects of the industry. This, many have argued, has been achieved through easing access to spectrum in some cases, not regulating online data-based services in others, and upholding the ease of doing business in the sector.

However, legitimate concerns have been raised by others in terms of how much the Act has achieved—in terms of modernisation of licensing, censorship, interference in online services, and handling of personal user data. These concerns are driven by how clauses have been formulated in the Act, showcasing ambiguity in many cases and leaving considerable room open for interpretations and further clarity.

As the rule-making process for the new telecom law ensues, here is a look at four appreciations of the Act and four criticisms of it, too.



“The new Telecom Bill replaces ‘licence’ with ‘authorisation’ specifying that authorisation would be required to provide telecommunication services.”

Lt Gen (retd) Dr SP Kochhar

Director General, Cellular Operators Association of India

THE PROS

#1

Constitutionalising allocation of spectrum

One of the biggest factors that drew ubiquitous appreciation in the Telecom Act, 2023 is in constitutionalising the procedure for administrative allocation of spectrum for various broadcasting and communications services. The Act brings relief to the nascent satellite communications (satcom) sector by including it under the services for which spectrum allocation can be conducted.

An allocation process is beneficial in many ways since it enables the government to offer companies a spectrum-sharing approach to offer services related to broadcasting and communications. So far, the commonly used process for auctioning spectrum has seen private entities acquire exclusive usage of spectrum. This process, typically, leads to large entities with deep pockets acquiring spectrum—thereby getting the power to privately control services as well as the pricing involved in any entity being able to access spectrum. In ways, auctioning can leave out new entrants in the telecom industry, by actively discouraging them due to very high capex requirements.

Administrative allocation, particularly for satcom services, will be beneficial as it can bring forth a more open and competitive market. By enacting this into law, the Telecom Act, 2023 can potentially open the doors for a more competitive overall broadcasting and communications market—with more choices for consumers to follow.

#2

Leaving OTTs out of traditional telecom ambit, for now

One of the key debates leading up to the tabling of the Telecom Bill, 2023 was around whether internet-based, online and data-driven services, such as Meta's WhatsApp, Netflix, Google's YouTube and so

on, would come under the ambit of the same set of regulations that govern traditional broadcasting and telecommunications services.

This concern has been somewhat alleviated as the Act foregoes explicit inclusion of Internet-based services, classified typically as over-the-top (OTT) services, from the legislation. Backing this up further while speaking with media, Union Telecommunications Minister Ashwini Vaishnaw indicated that OTTs will indeed not be regulated under the Telecom Act, and will be regulated by the Ministry of Electronics and Information Technology (MeitY) and legislations of the Information Technology Act.

The move is a welcome one for most online service providers since it helps them avoid similar restrictions, regulations for providing services, and prosecutions that are faced by traditional telecom operators. This is a crucial piece of legislative difference, particularly because OTTs are inherently and structurally different from any traditional telecom service—and industry advocates have long argued that they cannot be regulated in the same vein as traditional services.

#3

Regulatory stability for licensing, penalties and ease of business

The Telecom Act has replaced the much-criticised licensing procedures with a digitised authorisation process instead, for service providers looking to gain clearance for offering services. Penalties levied for breach of law have received a spate of clarifications, which too have been appreciated by many stakeholders of the industry. All of this, industry stakeholders have said, will benefit the sector.

“The Bill brings in the proportionality and nexus with the nature of the offence and will lead to a considered and rational approach to penalties. It is a progressive



“Given that the Bill aims to protect consumers, it is important that the sensitive personal information of users is not misused in the data processing lifecycle.”

Shreya Suri

Partner, Induslaw

step designed to increase industry confidence and increase ease of doing business. It replaces ‘licence’ with ‘authorisation’ specifying that authorisation would be required to provide telecommunication services. This would simplify the overall regulatory landscape for telecom services,” said Lt Gen (retd) Dr SP Kochhar, Director General of the telecom industry body, Cellular Operators Association of India (COAI).

The Act also did not fiddle with any postulates of foreign direct investment (FDI) in the telecom sector—right now, 100% FDI is permitted in telecom, with 49% not requiring any government approval.

#4

Attempt at reducing telecom frauds

Finally, many stakeholders have stated that the Telecom Act’s move to cut down on telecom fraud is a largely positive one. This has been done by imposing a three-year imprisonment term and penalties of Rs 50 lakh for SIM card fraud. Any new user onboarding will further require biometric authentication of a user, which in turn could add significant accountability to the entire procedure of users gaining access to telecom services. Cloning of SIM cards, too, is now a civil, financial and criminal offence.

This will be crucial, as a multitude of online crimes and frauds have proliferated in the industry due to widespread access to connectivity. Regulating access by linking users to connections used by them could also boost traceability and tracking down of individuals in case of cyber complaints being filed against them.

THE CONS

#1

Uncertainty around the definition of OTT

While Vaishnav has offered verbal clarification on OTTs not being included for regulation in the Telecom Act, the lack of concrete codification of this under the law has left

wide room for ambiguity—and the potential for future modification in its overall interpretation. Such ambiguity in interpretation could mean that hypothetically, unless OTTs are codified firmly under law, they may at some point be regulated within the same ambit as traditional telecom services.

Industry stakeholders have expressed similar concerns emphasising the ambiguity surrounding the exclusion of OTT services from the legislation. Experts point out that the definition of ‘telecommunication service’ in the current version is broad enough to potentially include OTT services, raising the possibility of state and, particularly, DoT intervention in the domain of internet services, such as WhatsApp, Signal, and others.

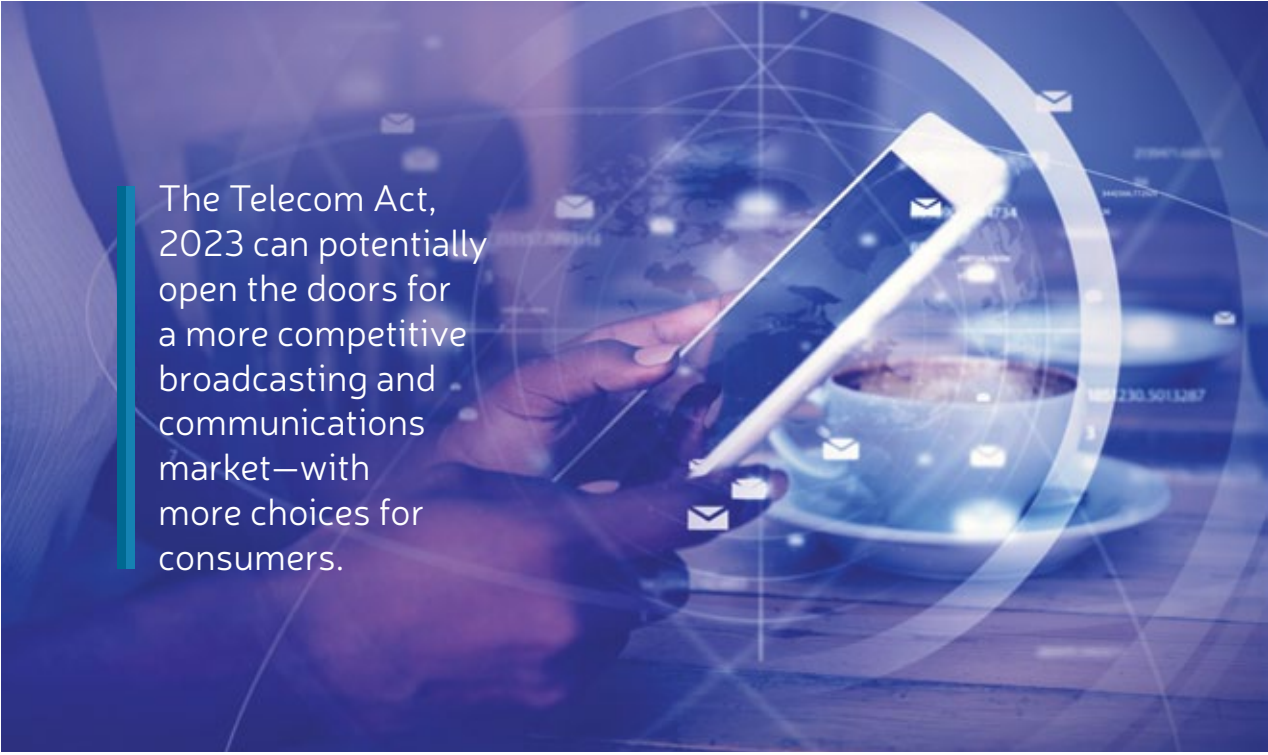
#2

Government control and censorship

One of the biggest concerns about the Act is around government control and censorship of the freedom of speech and communications—without leaving any room for checks and balances. These are included in clauses 19(f) and 20(2) of the Telecom Act, 2023. These give the government control over “any message or class of messages, to or from any person or class of persons, to or from any telecommunication equipment or class of telecommunication equipment, or relating to a particular subject brought for transmission by, or transmitted or received by any telecommunication service or telecommunication network.”

Control over such a sweeping definition of communications services has been afforded to the Centre, which can now cite national security interests to crack down on any service. Industry experts have argued that this has been done without keeping in place any accountability for the government to take over services.

Clause 3(7) of the Act is the one that deals with this and leaves open a wide band of situations which the



The Telecom Act, 2023 can potentially open the doors for a more competitive broadcasting and communications market—with more choices for consumers.

government may be able to use for its benefit—without users or companies having any apparent recourse against it.

#3

Questions around licensing and authorisation

While experts have argued that shifting from 'licensing' to 'authorisation' in the Telecom Act represents a significant change, closer examination suggests that the main difference lies in the digitisation of procedures.

Additionally, state bodies now have specific authorisation powers for telecom infrastructure deployment. However, aside from these aspects, the authorisation process closely resembles the previous licensing framework, raising questions about the actual regulatory differences on the ground.

#4

Concerns around personal privacy of users

The Act raises significant concerns regarding the use of user biometrics for safety measures, creating uncertainties about potential misuse, targeting, censorship, and overall data handling.

According to Shreya Suri, Partner at Induslaw, the involvement of multiple intermediaries in collecting and processing sensitive information poses challenges. "Whether they will have appropriate technical and organisational measures in place to ensure the security of the personal data being collected as well as meeting other compliance obligations under the Digital Personal Data Protection Act, 2023 is a question which needs to be evaluated before implementing this process," she said.

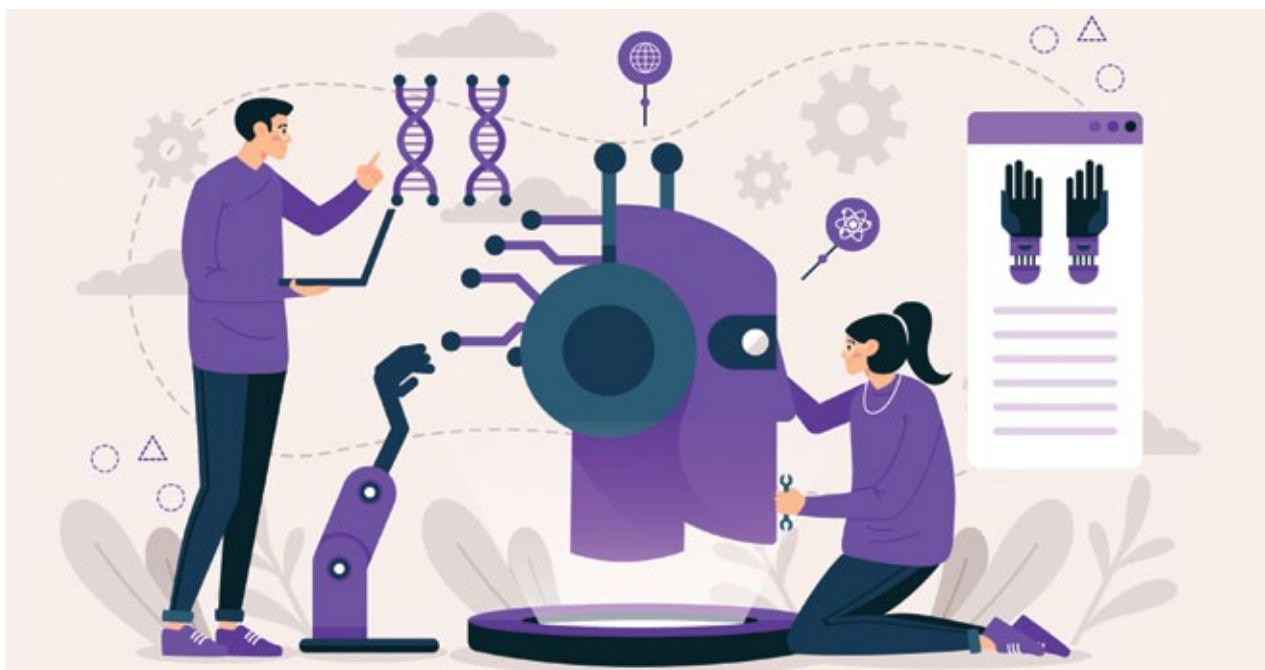
Suri further emphasised the need to prevent the misuse of users' sensitive personal information, aligning with the bill's goal of consumer protection. "Given that one of the aims of this Bill is to protect consumers, it is important that such sensitive personal information of users is not misused by any entity in the data processing lifecycle."

Regarding telecommunication identifiers, expected to identify users linked to biometric information in the verification process, Suri highlights uncertainty. It remains unclear if the central government's allocation of these identifiers grants access to underlying information. Suri urges that any access should adhere strictly to circumstances and situations permitted under the DPDP Act. 🔄

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Creating India's first-generation indigenous AI infrastructure

The 'India AI Programme' aims to bring to the forefront efforts to create the first generation of indigenous AI infrastructure in the country



BY VERNIKA AWAL

On October 13, the Union Minister of State for Electronics and Information Technology, Rajeev Chandrasekhar, spoke about the India AI Programme at a press briefing. Under the ambit of the Ministry of Electronics and Information Technology (MeitY), this programme is set to define the development of

datasets, as well as indigenous compute capability, for what is being colloquially referred to as Indian artificial intelligence (AI). In reality, the policy is a much-needed move that can not only bring multi-billion-dollar contributions to the country's economy but also bring about considerable democratisation in the access to technology within the nation.



“We are creating AI compute capacity in the public sector, where C-DAC is building an indigenous AI compute service—Param Rudra.”

Rajeev Chandrasekhar

Minister of State, Ministry of Electronics and Information Technology,
Government of India

India's infrastructure for AI chips is crucial as most chips used for AI tasks in India are presently designed in the US, and manufactured in Taiwan.

WHAT IS THE 'INDIAN' AI?

To put things simply, what is being referred to as 'Indian' AI is essentially a version of global AI applications and infrastructure, tuned specifically to Indian enterprise sensibilities. An early attempt at setting this up lies in the MeitY-backed Bhashini—the datasets project under the Centre that seeks to develop and deploy local language databases within indigenously developed mobile applications.

It is interesting to note that Bhashini, in many ways, laid the foundation stone for the development of Indian AI infrastructure. By creating repositories of local language data of 22 languages of India, Bhashini laid the early approach towards creating a data infrastructure framework—leading up to the formation of the India AI Programme.

'Indian' AI, on this note, refers to the development of local language datasets, as well as locally accessible hardware that can power AI applications suited to lower costs. At the heart of the India AI Programme lies the fact that today, AI as we know it is considerably expensive to operate—thereby making it a near-exclusive club for Big Tech companies to play in. India, on this note, wants to alter this.

BIRTH OF THE INDIAN AI INFRA

Detailing this further in a media interview, Chandrasekhar said: "We are creating AI compute capacity in the public sector, where the Centre for Development of Advanced Computing (C-DAC) is building an indigenous AI compute service—Param Rudra. For the private sector, we have submitted a proposal to the government and it will need funding. The idea is to create a significant amount of Graphics Processing Unit (GPU) capacity in the private sector, with the government as a partner. This will be like a public-private partnership. The latter will give AI compute as a service for startups, researchers and for anyone who has a model that needs to be trained." This details what the programme will bring along with it.

Set to be announced in January 2024, India AI will seek to grab Big Tech and use their solutions to be able to design chips that are cheaper to scale and deploy in the market—than the most commonly used commercial standard at the moment from US chipmaker Nvidia.

At the heart of this effort will be an intention to make chips available to academia, researchers and startups. Academia, in particular, has complained for long about the lack of access to resources that could help them scale applied research efforts in AI. Unlike large conglomerates, institutions in India have little budget to acquire high-performance computers, complete with servers of cloud-based GPU access to speed up research efforts. Owing to this lack of financial resources, Indian academia is, for now, lagging behind its US counterparts in the pace of adoption and adaptation of AI research.

WHAT IS THE PRIVATE SECTOR DOING?

As the country gears up towards the announcement of the India AI Programme, private entities are accelerating work with larger available capital. On December 6, Hiranandani Group's data centre project, Yotta Data Services, announced a partnership with Nvidia to create an on-cloud supercomputer, called Shakti Cloud. The service is set to go live this month itself, and customers will have access to 4,096 GPUs on the cloud through its platform.

By June this year, the GPU capacity is expected to increase 4x, while by end-2025, this capacity is expected to finally reach its target of 8x the number of chips it inaugurated with.

Access to top-grade Nvidia GPU chips is crucial for running generative AI applications, the flavour of the season in 2023. These chips are one of the most reliable and most powerful, hence justifying their massive market demand at the moment.

Nvidia, however, has not just partnered with Yotta. On September 8, the company announced two successive

Bhashini laid the early approach towards creating a data infrastructure framework—leading up to the formation of the India AI Programme.

IN BRIEF

- The India AI Programme will focus on local language datasets and affordable AI infrastructure to democratise technology access and boost the economy.
- It involves tuning global AI for Indian sensibilities, with Bhashini laying the groundwork for local language datasets. The program focuses on affordability.
- The programme plans to create public and private sector AI compute capacity, making AI more accessible through partnerships and funding initiatives.
- Private entities are partnering to create on-cloud supercomputers and AI clouds, accelerating AI infrastructure development.
- Building India's chip capability is crucial geopolitically, offering immunity and bargaining power in conflicts and fast-tracking development.

deals with two of the country's largest conglomerates—Reliance Industries and Tata Sons. While Jio Infocomm, the tech and telecom subsidiary of Mukesh Ambani's RIL, will leverage Nvidia to build local language development infrastructure, Tata's applications are two-fold—one, building an AI cloud to be served directly to clients through a cloud platform running on Nvidia chips. Two—through Tata Consultancy Services, India's largest IT services firm, the latter will develop AI-driven applications for its clients.

DEVELOPMENT OF THE IDEA

Building India's chip capability will also, in the mid-term future, tie in with the India Semiconductor Mission (ISM). Under the latter, the Centre continue to field new applicants for the production-linked incentive (PLI) scheme in this sector. Given that the onus of indigenous chipmaking will take a while to be realised, and the Centre modernising India's fab, Semi-Conductor Laboratory (SCL) in Mohali, ISM could well help fast-tracking the development.

The development of India's infrastructure for AI chips is also crucial from a geopolitical standpoint. At present, most chips used for AI tasks in India are designed in the US, and manufactured in Taiwan. Given the propensity of geopolitical conflicts with two ongoing wars at the moment, designing and developing chips locally will give India immunity and soft bargaining power with other nations that do not have the bandwidth to source commercial-grade chips for academia.

While there is no timeline at the moment, a two-year tentative plan to see the first batch of indigenously developed chips coming in physically is in store right now, as per industry officials with knowledge of the matter. This timeline, many have said, is practical too; Indian-origin chip designers and engineers make up one-fifth of all chip designers globally. Cashing in, therefore, only seems to be the right idea going forward. 🍀

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2018



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2017



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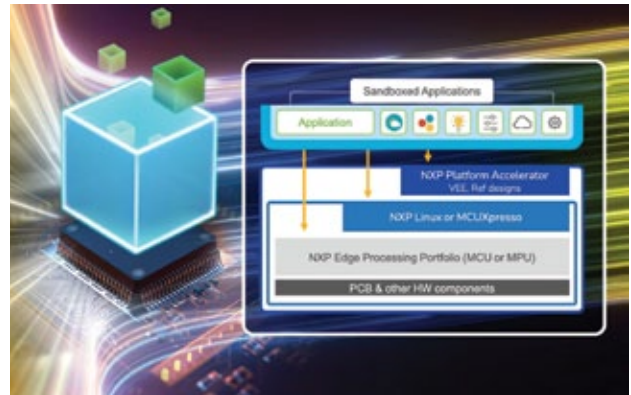
NXP unveils platform accelerator for IoT Edge applications

NXP Semiconductors, in collaboration with MicroEJ, has launched the NXP Platform Accelerator, transforming the software design process for industrial and IoT Edge applications. The platform utilises MICROEJ VEE software containers with standardised APIs, providing a smartphone-like experience and enabling manufacturers to streamline product development, reducing costs.

Addressing challenges associated with developing smart devices for industrial and IoT markets, the NXP Platform Accelerator ensures software portability across NXP's portfolio of RTOS-based MCUs and Linux-based Applications Processors. This accelerates new product development by seamlessly integrating advanced functionalities like power management and 3D/2D graphics from NXP's processor portfolio.

The NXP Platform Accelerator tackles the complexity of smart device development by utilising software containerisation, allowing binary software portability across NXP processors, from MCUs to applications processors. This approach promotes rapid prototyping and facilitates the creation of a diverse portfolio of smart devices adaptable to evolving market needs.

Additionally, the platform introduces sandboxed application deployment at the edge, bringing capabilities



like over-the-air updates, downloadable apps, and microservices. The NXP Platform Accelerator integrates advanced development tools, including simulation, virtual device management, and support for multiple programming languages.

Currently available for NXP's processors, including the i.MX RT595 and i.MX RT1170 crossover MCUs, the NXP Platform Accelerator empowers manufacturers to unlock the full potential of NXP's hardware innovations, making development processes more efficient and agile in the rapidly evolving landscape of industrial and IoT edge technologies.

Etisalat, Huawei trial world's first 1.6Tbps optical solution

Etisalat by e& and Huawei recently announced the successful completion of the world's first 1.6Tbps per wavelength technology trial on an optical transport network, marking a significant milestone in the ultra-high-speed optical industry. This achievement positions Etisalat by e& as fully prepared for the 100T network platform, a crucial step towards hyperscale cloud computing and the acceleration of the 10 Giga UAE Initiative.

Continuing its leadership in the optical industry, Etisalat by e& showcases innovative solutions and early technology adoption. The 1.6Tbps per wavelength technology, tested in collaboration with Huawei, is a part of their commitment to delivering an advanced and robust network in the UAE. Specifically, it demonstrates the capability of 1.6Tbps on the DC-centric OSN 9800 Kepler platform, addressing

the growing demand for cloud-based business services, enhanced home broadband, and 5G services.

Khalid Murshed, Chief Technology and Information Officer, Etisalat by e&, expressed their commitment to delivering a premium customer experience and emphasised the innovation's role in providing one of the fastest and energy-efficient connectivity for hyperscale computing. The 1.6Tbps technology not only meets the increasing capacity demands but also reduces per-Gbit power consumption by 65%, laying the groundwork for a modern digitalisation and environment-friendly future.

Victor Zhou, President of Huawei's Optical Transmission Domain, highlighted their collaboration with Etisalat by e& and emphasised Huawei's commitment to technological innovation, supporting Etisalat in enhancing user experience and creating greater business value.

GlobalLogic acquires Mobiveil for embedded software capabilities



Digital engineering company, GlobalLogic, has signed a definitive agreement to acquire Mobiveil, a specialised embedded engineering services firm based in the United States. The acquisition aims to broaden GlobalLogic's capabilities in embedded software, essential for digital products and services in industries such as semiconductor, automotive, media, medtech, and high tech. The acquisition also brings marquee client relationships and provides GlobalLogic with immediate access to a substantial skilled talent pool relevant to the industry.

This strategic move provides GlobalLogic with access to Mobiveil's mature embedded engineering Centres of Excellence (COE) based in five locations across the US and India, complementing existing COEs in Central and Eastern Europe. Mobiveil's competencies will enhance GlobalLogic's capabilities across embedded software, hardware and ASIC technologies. The three co-founders of Mobiveil, Ravi Thummarukudy, Gopa Periyadan, and Srinivasan Duraiswamy, will join the GlobalLogic Leadership team as part of the agreement.

Mobiveil specialises in the development of Silicon Intellectual Properties, platforms, and solutions for the networking, storage and enterprise markets. It leverages decades of experience in delivering high-quality, production-proven, high-speed serial interconnect Silicon IP cores and custom and standard form factor hardware boards to leading customers worldwide. The company has engineering development centres in Milpitas, California, Chennai, Bangalore, Hyderabad, and Rajkot, with sales offices and representatives located in Europe, India, Israel, Japan, Taiwan, the People's Republic of China, and the US.

Cisco to acquire networking and security company Isovalent



Cisco has announced that it will be acquiring Isovalent, a leader in open source cloud-native networking and security. This move aims to strengthen Cisco's secure networking capabilities across public clouds, aligning with its Security Cloud vision—an AI-driven, cloud-delivered, integrated security platform.

Isovalent's acquisition will contribute to the Cisco Security Cloud, offering advanced protection against emerging threats across any cloud, application, or workload. The collaboration will leverage the open-source power of Cilium, led by Isovalent, creating a unique multicloud security and networking capability to simplify and accelerate digital transformation journeys.

Jeetu Patel, EVP and GM of Security and Collaboration at Cisco envisions a distributed environment with security controls providing total visibility without compromising networking and application performance, made possible by the combination of Cisco and Isovalent.

Isovalent's expertise in eBPF and its development of Cilium, a leading cloud-native solution for networking and security, are key factors in the acquisition. Cisco plans to continue offering and building on Isovalent's innovations, including Cilium Mesh, Tetragon, and Isovalent Enterprise.

Stephen Augustus, Head of Open Source at Cisco, emphasises the commitment to nurturing and contributing to the eBPF and Cilium open-source communities. The acquisition strengthens Cisco's role in supporting the open-source ecosystem and accelerates innovation across cloud-native, security, and networking challenges.

Cisco and Isovalent, both leaders in networking and security, aim to provide solutions powered by eBPF technology, addressing the challenge of protecting workloads regardless of their location. Cisco commits to Cilium and Tetragon as open-source projects and plans to establish an independent advisory board aligned with the open-source community's needs.

Ciena builds 600G transmission route in South Korea for KT

Ciena has completed the construction of South Korea's first nationwide 600G transmission network for the telecommunications company KT. This project by the South Korean telecommunications company is an initiative to proactively address the rapidly increasing data traffic related to AI, cloud, and 5G, and to prepare for future services such as 6G.

The transmission network, operational since September 2023, spans over 1,000 km and is capable of transmitting 600G per wavelength in long-distance segments, connecting major cities nationwide from Seoul to Busan, Gwangju, and even Jeju Island.

Leveraging Ciena's 6500 flexible grid Reconfigurable Optical Add/Drop Multiplexer (ROADM) photonic layer with WaveLogic 5 Extreme (WL5e) coherent optics, and Manage, Control and Plan (MCP) domain controller, the transmission route establishes a robust foundation to handle rapidly increasing bandwidth needs.



Henry Kim, Regional Managing Director of Ciena North Asia emphasised Ciena's role as a pioneer in coherent optical technology, supplying equipment capable of delivering 100G and 400G services. The introduction of the 600G transmission network by KT is anticipated to offer a groundbreaking and cost-effective solution for efficiently transmitting high-capacity traffic across South Korea, thereby significantly enhancing dedicated circuit services.

Deutsche Telekom offers AI protection for company cell phones

Deutsche Telekom has introduced a new service, Appvisory Secure App Check, utilising Artificial Intelligence (AI) to enhance the security of business cell phones and tablets. The service automatically scans applications for security and data protection vulnerabilities, employing AI technology to analyse apps both before and after installation. By detecting malicious apps before they reach the device and the company network, the service enables businesses to promptly identify security issues, reducing the risk of internal regulation or GDPR violations.

The technology offers insights into app vulnerabilities, advising customers on addressing these issues and providing guidance on future app protection. Klaus Werner, Managing Director of Deutsche Telekom Business Customers, emphasises the need for real-time cyber defence in the ever-evolving landscape of mobile workplaces. Appvisory CEO Sebastian Wolters adds that the integration of Appvisory into Deutsche Telekom's portfolio enhances mobile working security.

Once installed, the service continues to monitor the app, alerting customers to potential risks during updates and facilitating the suppression of dangerous downloads.



The solution also proactively orders updates when patches are available for security vulnerabilities.

As mobile service devices become lucrative targets for cyberattacks, the new service addresses the rising threat, especially in the context of increased remote work due to the COVID-19 pandemic. Payment apps on company smartphones are highlighted as attractive targets, with cybercriminals increasingly focusing on financial transactions through fraudulent emails and phishing attacks. According to BITKOM data, almost half of the cyberattacks in 2022 targeted company customer data, emphasising the critical importance of robust mobile security solutions.



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S. Krishnan

Secretary, Ministry of Electronics and Information Technology,
Government of India

“Becoming self-sufficient in semiconductors may take some time”

*For this 1989-batch IAS officer of the Tamil Nadu cadre, technology has always been a catalyst of change. In his earlier role as Associate Vice President at ICT Academy, he led strategic planning, national special initiatives, corporate partnerships, government projects, education technology, marketing, and advocacy. As the Secretary of the Ministry of Electronics and Information Technology (MeitY) **S Krishnan** is responsible for supervising the implementation of the recently passed Digital Personal Data Protection (DPDP) Act, 2023. He is also at the forefront of driving the implementation of the country's ambitious semiconductor mission to create the component ecosystem.*

*In an interaction with **Shubhendu Parth, Thomas George, and Sunil Rajguru**, he lifts the curtain and gives a peek into the making of a new India on many fronts—from DPDP and IoT to Industry 4.0, interconnection platforms, and Make in India. Excerpts:*

What's your reckoning of the DPDP regulatory move? Are you satisfied with its progress? What implications will it have on compliance in India Inc.?

As you're aware, the DPDP Act was enacted in August. The Parliament has enacted it. It has also secured the consent of the President. Now, we are at the stage where rules are being drafted. There are several sections; in fact, almost 88 sections for which rules have to be drafted. The process of drafting the rules is nearing completion.

Thereafter, we will have internal consultations and the draft will be put out for public consultation.

The Act itself has a provision which mandates that any rules under the Act have to be published for consultations before they are finalised. So, to that extent, the industry and others will get adequate opportunity to share their views on the draft. There will be adequate stakeholder consultation and hence there is no reason to be concerned. As far as industry is concerned, it is a very positive provision for them. Different sections of the Act can be brought into force on different dates. This means that based on industry consultation, and based on their level of preparedness, the government can give more time to deal with genuine difficulties while complying with the provisions.

We intend to remove difficulties and ensure the balance of interests on both sides. The Act, itself, is very important from a personal data protection angle. All of us, as citizens, you and I, will also benefit. The main feature fundamentally is that there's a formal process of consent and that your data cannot be taken without your consent. The other part of it also is about how long the data can be kept. Once the need for the data is over, they will have to get rid of it. That is what is called the 'right to forget'. I think for individuals and citizens, there is a lot of positive protection.

Another important development is the Indian semiconductor vision. We have been trying this

“In the Indian context, the challenge with Industry 4.0 lies in the substantial need for retrofitting due to the incorporation of sensors and data collection.

India is working on building indigenous capacity for CMOS and infrared cameras and the system-on-chip mechanism, integral to IoT and devices.

since the 1980s and 1990s and always seem to miss the bus. Can we finally become self-sufficient on this front?

Becoming a self-sufficient nation may take some time because our demand is going to be very large. Let us be clear that we are the most populous country—and chips are becoming part of almost any kind of device that we use, including lights and fans and everything which now carries a semiconductor chip. And especially if we start using electric vehicles, the number of chips there will also increase. So, the demand for semiconductor chips in India is going to be very large. One should not make a very ambitious projection saying that we will be able to establish complete self-sufficiency. Production of semiconductors also includes specialised applications, ranging from being mass-produced to specifics for complex electronics and niche areas.

So, in that situation, I think it may not be realistic to expect that all our requirements will be produced domestically. What we may be doing is that in certain kinds of chips, we will be exporting and in certain kinds, we will be importing. That is why it is called the global value chain. The value chain extends across different countries, but you must ensure that the value chain is resilient and you should not be reliant on just one source for what you require. You should have a multiplicity of sources, at least two or three sources, so that if one fails you have another option in hand. Overall, we should target to establish a reliant and robust supply chain that will not get disrupted. And we must have a substantial production capacity within the country. It is also important to note that globally no country fully manufactures all components of complex electronics. At the most only 40-45% value addition is done by any one country in terms of complex electronics.

What about the sensor-based technologies? While there has been a surge in efforts towards digitalisation after the pandemic, Industry 4.0 has not really taken off in India. Why?

MeitY is not the only agency which is responsible for Industry 4.0. While we are looking at various emerging technologies, Industry 4.0 primarily relates to the manufacturing sector. So, several other entities in the

Government of India are also focusing on that, along with many state governments. Many new factories are coming up that are adopting Industry 4.0—they are called Lighthouse factories.

The challenge, at least, in the Indian context with Industry 4.0 is the need for a lot of retrofitting because it involves sensors and the collection of data. Now, retrofitting is a slightly more challenging issue, because it has costs involved. It depends on the demonstration of the benefits to the industry, because fundamentally, it is in the manufacturing industry, and they should see cost advantages in actually doing it. So, the point is that we can address it and make sure that the skilling is done, and the technology is made available. We are doing that through several Centres of Excellence. Beyond that, the actual investment needs to come from the private sector.

Talking of IoT and equipment, what are the other initiatives beyond PLI?

Indeed, beyond PLI, we've taken significant steps. At a recent event in Delhi, we unveiled three camera types developed by CDAC, fostering tech transfer to private firms for manufacturing of CMOS and infrared cameras. So, we are working on building indigenous capacity for these cameras and the system-on-chip mechanism, integral to IoT and devices.

One of these cameras is designed for tracking processes in sugar mills, and monitoring the crystallisation of sugar and is adaptable to various industrial applications. Another is a standard CMOS camera similar to closed-circuit television, while the third improves nitrogen monitoring. We are permitting the private sector to take these up for large-scale manufacturing. So clearly, there is real support, not just financial support. The other important aspect is standards; we also need to address the issue of security and standardisation when such equipment is deployed.

You mentioned skill development in the context of Industry 4.0. Do we have a roadmap for the next 25 years to address emerging technology needs?

It is an important area that we are working on, especially for the new-age skills and the use of emerging technology.

On the skill development front, the focus should be on fostering a mindset that can help the country quickly ramp up infrastructure to meet emerging needs.

However, creating a precise 25-year roadmap for this sector is challenging, given the rapid evolution of technology. How do we anticipate 25 years from now? What will be the requirement then? I think we have to be nimble than that.

Fundamentally, the focus should be on fostering a mindset that can help the country quickly ramp up infrastructure to meet emerging needs. And technology permits it. Strong foundational education is key, emphasising not only basics but also the ability to learn themselves. That is why the new education model and foundation level have to be strong. Resilience lies in ensuring a mechanism for quick reskilling or retraining when new technologies emerge. We need to make sure this robust infrastructure is in place to support these endeavours.

Will that include collaboration with educational institutions?

Yes, in fact, under the AI mission, a number of the Centres of Excellence will be established and coordinated by higher education. We are collaborating with educational institutions across a wide spectrum.

Speaking of security, a lot of refurbished equipment is being sent to India. Is the country becoming a dumping ground, particularly in terms of security?

We are mindful of this issue. However, we have not received any specific complaints about the influx of refurbished equipment into India. Inputs from MAIT and other entities suggest a significant opportunity for India to engage in the repair and refurbishment market. What this means is that the equipment comes in, it is repaired and then sent back with value addition. This is very people-intensive and can generate a lot of jobs. We have a pilot project underway with MAIT to understand the operational aspects of this.

This initiative is a crucial component of the reuse cycle, contributing to the circular economy. But it also has an e-waste angle, so the Ministry of Environment and Forest is involved. It also involves Customs and hence we have to coordinate with multiple agencies to build this repair ecosystem.

We are curious about generative AI. Is it the flavour of the season? Are people using it? Any views from your side?

It is good as long as it doesn't do any harm. There's an issue with deep fakes. That's problematic. And even in the US, they have an issue with deep fakes. So everybody across the world has an issue with the wrong use of AI when it creates user harm. We're very clear that we have to take action and look at it differently. But in addition to large language models, AI and other things can also be used for a lot of scientific models. The possibility of using them in scientific models is huge. And that can generate huge productivity gains in a lot of those key areas.

Has there been any thought process in terms of the ethical use of AI?

We are concerned about facets like deep fakes and everything else. Till such time that the Digital India Act is out – the existing provisions will apply through those rules. Otherwise, if it's unlawful activity, then naturally we have to take apt action.

Can you share something about the notice given to a few social media platforms on child pornography?

It was not a notice. What they have been told is under provisions of the IT Act. The Safe Harbor is subject to certain conditions. One of the conditions is that they have to exercise due diligence and ensure that no harmful content is carried out and they are not violating any law. We only brought to their notice that they should not take the Safe Harbor clause for granted. If a company does not exercise adequate due diligence and ensure that undesirable content is completely removed, the platform could be falling foul of the law.

We have alerted them about their responsibilities to conduct due diligence. If they fall flat and if we find such occurrences, then the platform or company may be liable as an intermediary. There is nothing like a cut-off date for this. The point here is very simple: they have to take responsibility. The companies cannot wash their hands off by saying they have no idea what is being put on their platform. 🙄

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LT GEN DR S P KOCHHAR

NAVIGATING THE COMPLEX CYBERSECURITY TERRAIN

As technology continues to advance and the security landscape becomes more interconnected, businesses must adopt a multi-pronged strategy to deal with it



In today's ever-accelerating technological landscape, the intricate relationship between emerging technologies and the imperative of cybersecurity is more pronounced than ever. As our world becomes increasingly interconnected through digital systems and innovations, the need to safeguard our digital existence becomes a paramount concern.

In this era of unparalleled technological progress, the boundaries between the physical and digital worlds blur as data flows ceaselessly through our interconnected devices and systems. The very fabric of our society, from finance and healthcare to transportation and communication, relies heavily on these technological marvels. Yet, with the immense benefits of these innovations come equally significant risks. The vulnerabilities inherent in our interconnected world can expose us to a myriad of threats, from data breaches and cyberattacks to identity theft and financial fraud.

Evolving digital technologies such as edge computing, blockchain, artificial intelligence (AI), digital tokens, and the Internet of Things (IoT) also bring in multifaceted challenges and opportunities. It is also important to deal with crucial aspects of skilling, awareness, policy, and the convergence of technologies and telecommunications, to get a clear view of the current cybersecurity landscape.

IMPACT OF NEW-AGE TECHNOLOGIES

Emerging technologies are transforming the way businesses and individuals interact with data and information. Edge computing, for instance, represents a significant shift in data processing, moving it closer to the source. This shift reduces latency, saves bandwidth and enhances privacy. However, it also presents security challenges, with increased attack surfaces requiring adaptable security strategies.

Blockchain, known for ensuring data integrity through its immutable ledger system, finds applications in finance, supply chain management and identity verification. Yet, it poses security concerns such as smart contract vulnerabilities, 51% attacks, DeFi exploits, cross-chain attacks and the looming threat of quantum computing.

Artificial Intelligence (AI) is another game-changer. Its predictive analytics, anomaly detection and automation capabilities are invaluable in various sectors. However, AI introduces security threats like sophisticated phishing and AI-powered malware. Ethical frameworks for AI development and deployment are crucial.

The emergence of digital tokens and currencies, like Bitcoin, has challenged traditional financial models. While they offer decentralised transaction systems, they also

“ Artificial Intelligence plays a dual role in cybersecurity. It acts as both a defence tool and a potential weapon for attackers.

The emergence of digital tokens and currencies, like Bitcoin raise security risks related to wallet security, exchange vulnerabilities and regulatory challenges.

raise security risks related to wallet security, exchange vulnerabilities and regulatory challenges.

DATA SECURITY IN THE NEW ECOSYSTEM

The rise of these technologies has led to an unprecedented increase in data generation, necessitating robust data management and security strategies. Data security now requires a proactive approach, emphasising secure coding practices and system design. The principle of security-by-design advocates for integrating security considerations right from the initial stages of system and software development.

There are several examples of security breaches resulting from neglect in the early stages of development that highlight the importance of this approach.

Marriott: In March 2020, Marriott announced a security incident that compromised the data of more than 5.2 million guests. Hackers used the login credentials of two employees to steal sensitive information from a third-party application. This was the second time Marriott suffered a data breach within two years, highlighting the importance of robust security measures from the onset.

EasyJet: In May 2020, EasyJet revealed it had been the target of a cyber-attack that exposed the email addresses and travel details of nine million customers. The airline also confirmed that 2,208 customers had their credit card details and CVV security codes accessed.

Electronic Arts: Hackers broke into the systems of Electronic Arts, one of the world's biggest video game publishers, and stole source code used in company games. The company made the announcement earlier this month.

McDonald's: McDonald's announced that it was affected by a data breach, which exposed the private information of customers and employees in South Korea and Taiwan.

Such incidents underscore the importance of prioritising security from the early stages of development.

Neglecting to do so can lead to significant problems, including poorly built security processes, outdated software, lack of infrastructure isolation and inadequate threat protection.

THE EVOLVING SECURITY RISKS

IoT and Edge devices have become ubiquitous, integrating into every aspect of our lives. From healthcare, like patient monitoring systems, to smart cities with traffic control, and home automation including smart thermostats and security systems, they offer convenience and efficiency but also introduce numerous security challenges.

The diversity and complexity of these devices, coupled with limited security features, create significant security vulnerabilities. Implementing robust security protocols, regular firmware updates, and secure network architectures is necessary to mitigate these risks.

AI plays a dual role in cybersecurity. It acts as both a defence tool and a potential weapon for attackers. Balancing automation with human expertise and developing ethical frameworks for AI in cybersecurity are critical steps in ensuring effective defence against evolving threats.

SKILLING AND AWARENESS

The cybersecurity skills gap is widening due to the growing demand for skilled professionals. Strategies for workforce development include specialised training programs, certifications, industry-academia partnerships, clear career pathways and mentorship programs. Skilled cybersecurity professionals are needed to oversee AI systems, provide context to AI findings, and make critical decisions, especially in complex threat scenarios.

End-users are the first line of defence against cyber threats. Educating them about common threats like phishing, malware and social engineering tactics is crucial. Regular workshops, online courses and security advisories keep users informed and vigilant. Organisations should foster a culture of security where cybersecurity is seen as a shared responsibility.

End-users are the first line of defence and educating them about common threats like phishing, malware and social engineering tactics is crucial.



IN BRIEF

- As technology advances, the cybersecurity landscape is becoming more intricate, demanding a multifaceted approach for a secure digital future.
- Emerging technologies like edge computing, blockchain, AI, IoT, and digital tokens offer opportunities but also pose security challenges.
- Security breaches, exemplified by incidents like Marriott and EasyJet, emphasise the importance of prioritising security from the early development stages.
- Robust protocols, firmware updates, and secure architectures are essential for mitigation.
- Organisations need to focus on workforce development, user education, and comprehensive policies for effective cybersecurity.

POLICY AND REGULATIONS

A comparative analysis of global cybersecurity policies and India's evolving framework highlights the need to balance global best practices with local needs. Comprehensive policies that cover emerging technologies and a collaborative, interdisciplinary approach involving government, industry, academia and civil society are crucial. Effective cybersecurity policies require the involvement of various stakeholders and must address emerging technologies. Public-private partnerships are key to successful policy implementation.

TECH CONVERGENCE AND TELECOM

Seamless integration between technology and telecommunications is vital for efficient data flow and management. Strategies for effective collaboration include information sharing, joint ventures and standardisation of security protocols. The development of international standards for cybersecurity in telecommunications is also essential.

Balancing security with innovation is essential to ensure that integration does not stifle progress. User-centric design and responsiveness to user needs are paramount. Organisations must prioritise user experience while maintaining robust security measures.

As technology continues to advance, the cybersecurity landscape becomes more complex and interconnected. Addressing these challenges requires a multi-faceted approach that encompasses technology, workforce development, awareness, policy and collaboration. By staying vigilant and proactive, organisations can navigate this landscape successfully and ensure a secure digital future for individuals, organisations, and nations. The evolving cybersecurity landscape demands continuous adaptation and a commitment to security at all levels of society. 🛡️

The author is the Director General of the Cellular Operators Association of India (COAI). A decorated military veteran, he retired as Signal Officer in Chief, the head of the ICT wing of the Indian Army. He also served as the first CEO of the Telecom Sector Skill Council (TSSC)..

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- It's not 'if' you will catch a cold. It's about bouncing back.
- Praveen Cherian, CEO, STL Global Services
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Taking flight: India's data centres in 2024

AI, DPI, and data-driven digitisation of the country's economy make data centres a key driver of tech investment, positioning them for substantial growth



BY VERNIKA AWAL

On October 31, 2022, Sunil Gupta, the chief executive and co-founder of Yotta Data Services, met members of the press at the opening of one of the firm's data centres. While one would imagine the opening of a data centre for a company that deals in data centre operations is regular fare, the announcement was a significant one—this data centre campus in Greater Noida was one of the first such hyperscale facilities in northern India.

Yotta's move signalled what many at the time had predicted—the time had come for data centres to shoot for the stars. The company's data centre, back in October 2022, saw only one of six planned buildings being inaugurated. Just one building had a capacity of 28.8MW of IT load and took investments of Rs 6,500 crore. Once all six buildings are up and running—the second one is

close to completion now, the Greater Noida data centre would have a total capacity of 160MW. The company has committed an investment of Rs 39,000 crore in the next five years.

The company, however, is not an outlier. Over the past few months, the rise of tech legislation in the country, proliferation of generative AI leading to massive data demand and digitisation of every sector further accelerating data volumes, suggest that in 2024, India's data centre market will lay the foundation for what could be its greater growth phase to date.

PROJECTING THE DEMAND

Real estate consultancy JLL India's half-yearly data centre sector update, published last on November 23, stated that in three-and-a-half years until the end of calendar

By 2026, India is likely to add nearly 700MW of data centre capacity—requiring up to 8.8 million square feet, or over 200 acres of land, in the process.

year 2026, India is likely to add nearly 700MW of data centre capacity—gobbling up 8.8 million square feet, or over 200 acres of land, in process. For this, JLL predicted capital expenditure of USD 4.4 billion—around Rs 37,000 crore—within this stipulated time.

Going by industry norms, this would just be investments towards land and real estate—taking IT equipment expenditure into account, data centres may take up total cumulative investments that are near a benchmark figure of Rs 2 lakh crore. In 2024, a chunk of this will contribute to bringing India's active data centre capacity to nearly 1318MW, as per JLL.

All of this suggests prolific demand for data centres in the country, thereby placing operators in this sector at the cusp of meteoric growth. Seizing this opportunity, companies are now deliberating on strategies to fuel this growth.

DIVERSIFYING BETS

Pretty much every data centre operator in India has announced capacity expansion plans and investments for the India market. Media reports quoting Abhijit Dubey, Global Chief Executive – Data and Infrastructure Services conglomerate, NTT Limited indicate that the company is working on doubling its operational data centre capacity from 16 working centres by March this year. The company has also announced a USD 2.5-billion investment plan for India, which includes data centres, subsea cables and more.

On August 10, California-headquartered data centre firm Equinix announced a USD 42 million (~Rs 350 crore) investment outlay to expand its latest scaled data centre operation in Mumbai, called MB4. In June 2022, the company also announced a USD 86-million investment to establish a larger data centre facility in Mumbai itself, called MB3, which is expected to become operational in mid-2024. While MB3 will have 4,150 total cabinets in terms of server capacity, MB4 is projected to house 700 such cabinets.

Speaking to a business newspaper, Sumit Mukhija, Chief Executive Officer, ST Telemedia Global Data

Centres (GDC), in which Tata Communications holds a minority stake, said that the company plans to invest USD 1 billion (~Rs 8,300 crore) by 2027 to expand its presence. The company's announced data centre capacity is nearly 300MW, with 100MW under construction. The Singapore-headquartered company has nine such facilities in the country.

Similarly, Sridhar Pinnapureddy, Founder and Chairman of homegrown data centre major CtrlS, has indicated that the company plans to invest USD 2 billion in six years, to add 300MW in the operational capacity of its data centres. At the moment, CtrlS has a capacity of 234MW operational across seven cities in India. Media reports also indicate that Yotta is imminently planning investments of Rs 16,000 crore (~USD 1.9 billion) to fund their data centre expansions.

FACTORS FUELLING GROWTH

JLL's November 2023 report pegged five clear reasons to fuel growth for data centres in India, "Increasing digital growth, Digital Public Infrastructure (DPI), 5G rollout, new applications of Artificial Intelligence (AI) and Machine Learning, (and) data protection laws and state incentives."

Looking at each avenue, it is clear why the quantum of investment in India from data centre operators is steadily increasing. Digital growth in India was accelerated in the country by the COVID-19 pandemic, which led to digitisation of India's payments infrastructure, onboarding of local shops into the e-commerce fold, and the inception of the Open Network for Digital Commerce (ONDC) to further take this forward.

In the banking and financial services sector, the digitisation of the Know Your Customer (KYC) process, as well as the complete digitisation of lending, credit and all financial services procedures has significantly boosted demand for data centres and outsourced IT services.

The proliferation of the Unified Payments Interface (UPI) is a key contributing factor in this regard. Digitised payments through UPI have ensured that contactless digital payments crossed 10 billion monthly transactions in September last year. With increasing proliferation,

More firms are seeking cloud-based services to automate business processes—and use data for both core and supplementary business functions.



IN BRIEF

- Digital surge, DPI, 5G rollout, AI applications, and data protection laws fuel India's data centre market growth, attracting significant investments.
- Digital transformation, UPI proliferation, and 5G adoption are driving the demand, especially in finance and manufacturing sectors, boosting data centres.
- The rise of generative AI applications is fueling demand for cloud services, leveraging structured enterprise data for enhanced intelligence and automation.
- Robust data protection laws and regulations are driving companies to localise operational data, fueling data centre expansions in India.
- Players like CtrlS, Equinix, NTT, ST Telemedia, and Yotta have announced substantial investments, reflecting the sector's massive growth.

demand for data centres has been reinforced as more individuals from India's billion-plus population demographic continue to migrate online.

The rollout of 5G services is further accelerating this. With 5G, more enterprises, especially in the manufacturing sector, are coming on board with the demand for smart factory automation, while consumer 5G services are also seeing increasing demand for data through telecom network operators as streaming services continue to replace traditional satellite-driven broadcast platforms. The advent of satcom services in 2024 is expected to further drive data demand forward, thereby rationalising data centre investments in the country.

The big market mover of 2023 was, however, AI. With the advent of generative AI, an increasing number of companies are betting on the use of structured enterprise data for business intelligence. More firms are seeking cloud-based services, which in turn use data to automate business processes—and use data for both core and supplementary business functions.

All of this is tied together with the rise of data legislation in the country. India, in August last year, notified its first dedicated technology law—the Digital Personal Data Protection (DPDP) Act. Coupled with the IT (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, India now has a robust set of regulations that mandate how data is handled and operated across the country. In the wake of these regulations, as well as the impending Digital India Act that could be legislated later this year, more companies are expected to localise operational data in the country.

Data localisation, therefore, could be the pivotal focus point of data centre operators increasingly betting on market expansions in the country. Just between the five data centre operators quoted above, planned investments of USD 7.8 billion (~Rs 65,000 crore) have been announced by foreign and domestic companies alike). This quantum is only likely to increase further, and 2024 would be a pivotal platform for these initiatives to take off. 🚀

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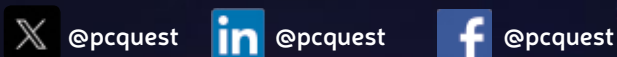


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Riding high on the digital transformation wave

Hidden like a backyard, data centres often go unnoticed. Yet, with rising demands and green expectations, they are set for increased attention and action



BY PRATIMA HARIGUNANI

What happens when we chew more apps, juggle more devices, stuff our lives with more technology and go crazy in the fast cruise of digitalisation? All that has to be powered from somewhere. All those pipes and engine rooms must be working furiously all the time.

If 2023 was any glimpse, and if what is coming in 2024 is watched closely, there would be no doubt that 'all that' is set to explode not just in demand but in capacity and consciousness too. Data centres are sputtering all

the power that IT needs, pushing forth businesses on the new oceans of Artificial Intelligence (AI) and digital transformation—and India is no exception.

EXPLOSIVE GROWTH, EXCITING DRIVERS

A recent report by Dell'Oro Group indicates that the worldwide data centre capex is forecast to rebound to 11% growth in 2024 as select hyperscale cloud service providers return to an expansion cycle and the spending freeze in the enterprise markets starts relenting. The India data centre market size has been slated to grow from



“The implementation of data protection and localisation regulations is playing a pivotal role in propelling the growth of data centres in the region.”

Devroop Dhar

Co-Founder, Primus Partners

USD 6.12 billion in 2023 to USD 10.89 billion by 2028, as augured by a forecast from Mordor Intelligence.

In India, data centre infrastructure is growing exponentially, and there is a growing preference for the Cloud and increased data consumption and generation by over half a billion digital users. Demand for new data centres is enormous in India, driven by the hyperscale facilities key internet players, such as Amazon Web Services (AWS), Microsoft, Google Cloud, and Alibaba Cloud, demand to power their clouds.

Dell'Oro outlook further highlights that server and storage system revenue is set for growth greater than 20% in 2024, while network and physical infrastructure revenues grow in single digit. The hyperscale cloud service providers could increase their data centre capex by 13% in 2024.

It is not hard to guess where this demand for more data centre coal is coming from. The ship of technology is moving at a staggering speed on waters like AI, Cloud and mobility. Interestingly, India is among the major data centre players in the APAC region. Also, as enterprises migrate to the Cloud, it drives more data centre muscle.

Devroop Dhar, Co-Founder, Primus Partners seconds that wave. “The data centre market in the APAC region is experiencing notable expansion, primarily fueled by emerging markets like India, Malaysia, and Thailand. India, in particular, is poised for substantial growth, with an anticipated doubling of its total data centre capacity in the coming years, positioning it among the fastest-growing markets worldwide.”

He also adds how the proliferation of Internet usage driven by 5G, the prominence of e-service delivery encompassing e-commerce, and the implementation of data protection and localisation regulations play a pivotal role in propelling the growth of data centres in the region.

According to a CBRE report, Global Data Centre Trends 2023, there was continued demand across industry verticals as businesses and governments move towards digitalisation and emerging markets such as Mumbai and Seoul recorded take-up growth. The report noted that the rapid growth of AI, along with other modern technologies, such as streaming, gaming and self-driving cars, will spur strong data centre demand; spawning innovations in data centre design and technology.

Vikas Sharma, Founder and Director, Hi-Com also brings in the part of how the implementation of the Data Protection Bill (DPDP) in India affects this space. “Organisations were expected to adapt their data handling processes to comply with the regulations, potentially influencing data centre strategies.”

“Yes, there is a huge surge in India to modernise the data centre, irrespective of whether it is Public Cloud or Private Cloud. It is a demand to run your business seamlessly otherwise you will be left behind in the business growth race,” points out Bhoopendra Solanki, Chief Information Officer, Sakra World Hospital.

All good and starboard then? Not really. A lot of new winds and factors are coming into play as the demand for more data centre coal piles up. It is kind of contradictory too as there is a need for more of this coal, and it needs to be green.

IMPERATIVES AND IMPEDIMENTS

Data centres do not come up like fairies or genies. This coal has to be mined from difficult places and shoved into engines with expert hands. There are factors like real estate, space management, power use, carbon impact and utilisation that have to be considered here.

As the CBRE report pointed out that there was a worldwide shortage of available power is inhibiting the growth of the global data centre market. Sourcing enough power came up as a top priority of data centre



“Earlier, servers needed a cooled environment, but now, cooling mechanisms are integrated into the servers, leading to significant energy savings.”

Bhoopendra Solanki
CIO, Sakra World Hospital



ZOOMING IN ON INDIA

- India's data centre market is highly concentrated due to higher initial investments and low availability of resources.
- The Government of India and various state governments are revising their data centre policies to support the infrastructural growth of data centres in India through tax subsidies.
- The IT ministry in India intends to provide up to Rs 15,000 crore (~USD 1.83 million) as an incentive under the national policy framework for data centres.
- The government plans to invest up to Rs 3 lakh crore (~USD 36.5 million) in the data centre ecosystem, over the next five years.

Source: Mordor Intelligence

operators across North America, Europe, Latin America, and Asia-Pacific.

Also, note that data centre establishment in India is cost-intensive which can be quite a barrier to entering the industry for many data centre companies. Considering the prevalent norms for commercial buildings applied to data centres, one stares at issues like wastage of space and increased cost. “Other factors like high real estate costs, expenses on improving wide area network connectivity, and increased equipment costs add to the weight of heavy Capex in the sector,” the Mordor Intelligence Report highlights.

However, the biggest pressure comes in the form of a clear and imminent need for data centres to embrace the sustainability model. Dhar concurs that the current focus should shift toward the environmental sustainability of data centres, a critical aspect as the industry aims for Net Zero emissions.

Speaking to Voice&Data, Tracy Baldwin, Global Lead, AWS Sustainability pointed out that the company is building the most sustainable infrastructure it can to deliver services to customers. “The core of what we focused on from the beginning is efficiency across every aspect of our infrastructure. And that is everything from designing our data centres and our hardware to modelling and tracking of performance to make sure that we continue to identify ways to increase efficiency.”

When big players like AWS embrace initiatives to use lower carbon, concrete, and steel in their data centres, it confirms that ‘going green’ is not a footnote anymore. “Lower carbon concrete, of course, needs to be a localised solution since you do not want to ship concrete. When we go to a new region, we will look at local climate patterns, to see what is the most efficient way to cool our data centres. We also have different designs, you know, depending on, we consistently update our design for data centres,



“Data centres are adopting renewable energy sources and energy storage solutions to enhance energy efficiency and reduce environmental impact.”

Vikas Sharma

Founder and Director, Hi-Com

so we get more efficient with each design generation,” Baldwin explains.

The carbon impact consideration is emerging as a crucial factor in the establishment of new data centres in India, although it is still in its early stages, underlines Dhar. “Major players in the data centre industry are increasingly emphasising the use of green and renewable energy to meet their energy requirements. Additionally, there is a concerted effort to incorporate green building practices, with some data centres obtaining LEED certification.”

But he also points out how Scope 3 emissions encompass a wide range of areas and pose challenges in terms of measurement. “Bodies like the Bureau of Energy Efficiency (BEE) may consider issuing new guidelines and best practices for enhancing the energy efficiency of data centres, addressing a current industry need. Government incentives for private entities establishing data centres should also factor in the broader spectrum of environmental considerations when calculating incentives, presenting a proactive approach to drive sustainability in the industry.”

Sharma observes that data centres are addressing infrastructure challenges through innovations in design and technology. “The rise of edge computing has prompted the development of smaller, decentralised data centres, reducing the need for extensive centralised infrastructure. This decentralisation enhances performance and responsiveness while mitigating latency issues.”

Solanki provides an optimistic perspective: “Today’s technology, such as energy-efficient Hyper-Converged Infrastructure (HCI) options and smart racks, is advanced. In the past, servers needed a cooled environment, but now, cooling mechanisms are integrated into the servers themselves, leading to significant energy savings.”

WHAT COMES NEXT?

As we move into 2024, a lot of this appetite and issues will manifest themselves on the ground.

As for CIOs and industry players, the surge comes with a lot of responsibility. Solanki recommends that irrespective of whether the business is using a Cloud or private and on-premises data centre, it should have BCP for the data centre in place. “It is very important to keep the heart (data centres) healthy. There should be data centre refresh planning on regular intervals like we refresh our production environment every four to five years and this environment becomes a development environment,” he says.

Sharma is confident of the progress the sector is making. “There has been a notable increase in both domestic and international companies investing in establishing data centres within the country. Additionally, the Government of India has launched initiatives like the National Digital Communications Policy (NDCP) to promote the growth of digital infrastructure, including data centres. The geographical distribution of data centres is also noteworthy.”

Dhar feels that the year would see significant capacity addition, with more than 500MW capacity expected to be added, though most of the capacity addition would be concentrated in Mumbai/MMR, Delhi/NCR, Chennai, Bengaluru and Hyderabad. “Focus now needs to be on the greening of data centres and achieving carbon neutrality, which would be a critical factor going forward.”

If all goes as expected, then the backyard of IT would cease to be what it was. It would stop being hidden and non-consequential to many. It could become the kitchen. Still not in the front but always on the top of one’s mind, and in action. 🍳

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A shift towards the ‘distributed’ future

The next-gen data centres are relying on software-defined technologies as their logical layer, allowing better control of physical and virtual resources



BY RAJ PAREEK

In the realm of next-generation data centres, automation takes centre stage, streamlining workflows and alleviating the burden of manual upkeep. The future is unpredictable, but one undeniable truth is the enduring presence of data centres. Positioned as one of the most secure industries, they boast a projected Compound Annual Growth Rate (CAGR) of 8% between 2023 and 2030, placing them at the forefront of the digital revolution. As businesses pivot from traditional data centres to the cloud, Gartner foresees that, by 2025, over 50% of global enterprises will embrace a serverless platform. For those who have deferred migration, the contemplation arises: Is the investment worthwhile for their business?

Data centre requirements vary based on factors such as structure, physical limitations, density requirements, and more. This article explores four common types of data centres: onsite, colocation facilities, hyperscale, and edge data centres, providing insights into their use cases and industry trends.

These data centres incorporate advanced technologies such as robotics, Artificial Intelligence (AI), Internet of Things (IoT), Robotic Process Automation (RPA), quantum computing, 3-D printing, 5G wireless networks, virtual reality, augmented reality, and blockchain.

As businesses shift to the cloud, Gartner predicts over 50% global enterprise adoption of serverless platforms by 2025.



IN BRIEF

- HiveDisk ensures top-tier data security by encrypting and distributing across multiple devices, enhancing redundancy.
- With a distributed network (hiveNet), data is retrievable even in device failures, ensuring uninterrupted accessibility.
- HiveDisk democratizes cloud storage, offering an affordable solution for businesses, startups, and individuals.
- Utilising idle device capacities, hiveNet reduces the need for additional data centres, promoting eco-friendly practices.
- Choosing hiveDisk means joining a movement prioritising data security, autonomy, and a user-controlled digital world.

The first half of 2023 witnessed robust growth in the data centre market; however, many major and secondary markets grapple with a supply and demand imbalance, resulting in a shortage of colocation space and escalating prices. The prevailing trend is shifting towards constructing self-owned data centres due to reasons like vendor reduction, customisation, and access to renewable energy resources. The adoption of prefabricated, modular

designs is becoming commonplace to enhance speed and efficiencies through standardisation.

SIGNIFICANT CHALLENGES

While data centres stand as some of the most sophisticated infrastructures, they grapple with inefficiency and low equipment utilisation rates, with security being another major concern.

In a broader context, Uptime has observed a consistent decline in the outage rate per site, as evidenced by four surveys of data centre managers and operators conducted from 2020 to 2022. In 2022, 60% of survey respondents reported experiencing an outage in the past three years, a decrease from 69% in 2021 and 78% in 2020.

Many organisations strive to simplify or downsize their data centres, but the objective is not for them to disappear entirely. Administrators can explore as-a-service options and cloud solutions to offload specific applications. According to Gartner, by 2025, it is anticipated that 85% of enterprises will shut down their traditional data centres.

The rapid growth of AI, coupled with other modern technologies such as streaming, gaming, and self-driving cars, is expected to drive continued strong demand for data centres and challenges too.

EMERGING TRENDS

In the early days of computing, data storage involved physical methods like punch cards and magnetic tapes. Even after room-filled computers, the process remained physical, relying on hard drives and external devices.

Today, many of us unknowingly store data in the Cloud, a network of remote servers allowing access from any device with an internet connection. These servers, commonly known as data centres, are crucial to our digital lives.

The transformation to cloud storage was gradual, and the journey continues. As we enter a new era, it is essential to consider Amara's law: "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."

THE DC TIER

TIER 1 (Basic capacity)

A Tier 1 data centre is the simplest with an uptime of around 99.671%, translating to 28 to 29 hours of downtime annually due to limited redundancy. Suitable for small businesses with basic needs, Tier 1 centres are cost-effective but lack the reliability needed by businesses requiring constant uptime and failproof service.

TIER 2 (Redundant capacity components)

A Tier 2 data centre has an uptime of 99.741%, reducing downtime to not more than 22 hours annually. While maintaining a single path for power and cooling like Tier 1, it includes some redundant components, making it more reliable. Suited for mid-sized businesses, Tier 2 centres offer improved performance with redundant hardware and software without incurring prohibitively high operational costs.

TIER 3 (Comprehensive redundancy)

A Tier 3 data centre, ideal for larger companies, boasts an uptime of around 99.982%, minimising downtime to 1.6 hours annually. Featuring comprehensive redundancy, multiple paths for power and cooling, and the ability to function during maintenance, Tier 3 centres provide superior reliability. They are often chosen by law enforcement, healthcare facilities, and organisations prioritising reliability.

TIER 4 (Fault tolerant)

Tier 4 data centres, selected by mega enterprises, achieve uptime percentages of 99.995%, equating to 0.5 hours of downtime yearly. With 96-hour protection from power outages and extensive redundancies, Tier 4 centres maintain consistent performance despite equipment failures. While operating costs are high, organisations with resources opt for enhanced performance and reliability.

TIER 5 (Sustainability factor)

A Tier 5 data centre, meeting Tier 4 requirements and more, features waterless operation, air pollutant detectors, securable server racks, and energy system monitors. Preferred for local and renewable power projects, Tier 5 centres offer unique environmental benefits, catering to organisations focused on sustainability.

Initially seen as a convenient way to access files, cloud storage's impact goes beyond convenience. Businesses now heavily depend on it, reshaping workflows. This shift raises concerns about data security, privacy, and the implications of AI. Addressing these challenges requires the right approach, and that is where hiveDisk comes in.

EMBRACING THE FUTURE

Cloud storage has evolved into an integral component of digital lives, furnishing a convenient means for individuals to store, access, and share data. Nevertheless, traditional cloud storage services often confront challenges encompassing elevated costs, restricted storage capacity, and apprehensions related to data security and privacy. These challenges have prompted the exploration of innovative solutions poised to redefine the approach to storing and accessing digital data.

In the progression of cloud storage, one name stands out—hiveDisk. This is not a byproduct of some technological era; rather, hiveDisk emerges as a timely solution addressing collective concerns about security and privacy. Opting for hiveDisk signifies selecting a pathway for file storage that envisions a future where cloud storage is accessible, secure, and under the user's control.

This is not just about data stored in some remote data centre; the essence of the cloud persists even when opting for alternatives to traditional data centres. HiveDisk operates on a distinct cloud paradigm: a distributed network known as hiveNet. This network disseminates data across a hive of computers.

HiveNet taps into the latent computing capacities of devices worldwide. Simply put, instead of conducting computational tasks in a singular centralised location like traditional data centres, hiveNet distributes these tasks across numerous globally connected devices. This approach augments efficiency, reliability, and sustainability.

The underlying idea revolves around the fact that many computers worldwide (including personal computers and servers) remain idle for a significant duration. During this idle period, these devices possess unused computing capacities, a resource which hiveNet aims to harness. This

HiveDisk signifies a pathway for file storage that envisions a future where cloud storage is accessible, secure, and under the user's control.

strategy allows hiveNet to furnish cloud computing services at a substantially lower cost, concurrently reducing energy wastage associated with idle devices.

This innovative approach ensures the security of data by encrypting and distributing it across multiple devices, enhancing data availability and redundancy. Even in the event of device failure, data remains retrievable from other devices within the network.

WHY HIVENET AND HIVEDISK?

When users opt for hiveDisk, they are not just embracing a service; they are becoming part of a movement—a hive that prioritises the security and autonomy of data. Every contribution matters, collectively building a secure, robust, and user-controlled digital world.

hiveDisk represents more than just the future of cloud storage; it embodies community. The firm believes it is the right way to store files, aligning with the global shift towards sustainable digital ecosystems by utilising the untapped capacities of existing devices. This environmentally conscious move reduces the necessity for additional data centres and the associated carbon emissions.

Security, accessibility, affordability, and sustainability form the foundation of hiveDisk. By offering a cost-effective solution, hiveDisk democratises cloud storage, making it accessible to a broader audience. This democratisation has the potential to drive innovation and growth, underscoring the significance of hiveDisk.

IMPACT ON CLOUD STORAGE

The introduction of hiveNet and hiveDisk into the cloud storage market promises to disrupt the status quo. By providing a distributed, secure, and cost-effective solution, Hive is positioned to challenge traditional cloud storage providers. Its unique approach to utilising unused storage capacities not only reduces costs but also promotes a more sustainable and efficient use of digital resources.

Sustainability: In today's digital age, sustainability is a growing concern. The energy consumption of data centres, the backbone of traditional cloud storage

services, significantly contributes to global carbon emissions. HiveNet and hiveDisk address this by utilising the unused capacities of existing devices, reducing the need for additional data centres. This approach makes cloud storage more sustainable and aligns with the global push towards an environmentally friendly digital ecosystem.

Security and accessibility: HiveDisk addresses security and accessibility, two critical aspects of cloud storage, through its unique data storage approach. By encrypting and distributing data across multiple devices, hiveDisk ensures data is secure and always accessible. Even in the event of a device failure, the distributed nature of hiveDisk's storage system allows retrieval from other devices in the network—a significant advancement in cloud storage.

Economic impact: By offering a cost-effective cloud storage solution, the Hive platform makes digital storage accessible to a broader user base. Small businesses, startups, and individuals, previously hindered by high costs, can now leverage the distributed cloud at a fraction of the price. The distributed nature of the platform allows users to contribute idle storage from their devices, offsetting monthly plans and democratising cloud storage. This democratisation has the potential to drive innovation and economic growth.

As the generation and storage of digital data continue to increase, the need for efficient and secure cloud storage solutions will grow. In this evolving landscape, Hive leads the way, shaping the future of cloud storage and redefining digital experiences.

Reflecting on Roy Amara's quote, it is evident that the impact of technologies like hiveNet and hiveDisk on cloud storage may be underestimated now, but their long-term effects will likely be profound. As the boundaries of what is possible with cloud storage are pushed, Hive is not just storing data; it is shaping the future. 🌱

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DRIVING TRANSFORMATION

By blending local expertise with its expansive global reach, STT GDC India is steering the nation's data centre technology landscape



BY SUMIT MUKHIJA



A co-location data centre services provider in India, ST Telemedia Global Data Centres (India) has been designing, building, and managing operations for more than two decades. It currently manages one of the largest white space areas, with more than 300MW of critical IT load spread across 29 facilities, including those under development, across 11 cities in India.

The company stands as a trailblazer in data centre innovation, specifically honing in on AI and GPU cloud services. The specialised proficiency in high-density computing and liquid-cooled servers perfectly caters to high-power demands, bolstered by the partnership with Firmus Metal International, propelling the concept of Sustainable AI Factories worldwide. The liquid-cooled

GPU setups have been launched in Singapore and India, with plans for global expansion.

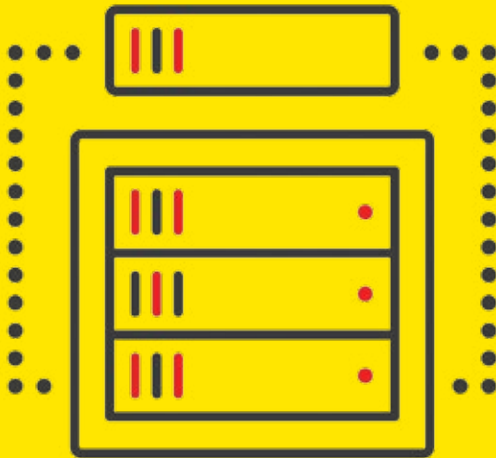
The company's forward-looking edge computing strategy revolves around establishing network-dense facilities not only in key urban centres but also in Tier-2 cities. Besides, leveraging IoT, sensors, and automation underscores the company's commitment to operational excellence, energy efficiency, and fortified security measures. This unique blend of localised expertise and expansive global reach positions STT GDC India at the forefront of the evolving data centre technology landscape.

ADDRESSING ENTERPRISE NEEDS

STT GDC India actively responds to evolving enterprise needs, spearheading digital transformation while

The company has invested in liquid cooling for servers and is exploring innovations like gas, dual fuel generators, and heat recovery solutions.

Rigorous testing, predictive maintenance, and real-time monitoring enable proactive identification and swift resolution of potential issues.



IN BRIEF

- STT GDC India leads in AI and GPU cloud services, deploying liquid-cooled GPU setups globally.
- The company's edge computing strategy spans key urban and Tier-2 cities, emphasizing IoT, sensors, and automation for operational excellence.
- With a 30% revenue market share, it actively contributes to India's digital ecosystem while focusing on sustainability and responsible innovation.
- Leveraging global insights, the company innovates in design and construction, maintaining a safety-first culture and achieving ISO 45001 certification.
- It prioritizes reliability and resilience through redundant systems and robust infrastructure to ensure up to 100% uptime.
- Committed to environmental sustainability, it is investing in energy-efficient solutions pledging net carbon neutrality by 2030.

alleviating IT and business pain points. With a substantial 30% revenue market share and strategic investments in 300MW IT power load, the company is contributing significantly to India's digital ecosystem.

The unwavering commitment to sustainability, exemplified through a partnership with Firmus Metal International to establish AI factories, reflects a future focus on responsible innovation. Collaborations with state governments and the establishment of a Bangalore Centre of Excellence also underscore the company's dedication to upskilling professionals. As India's digital growth unfolds, the company persists in expanding core and edge capacities, ensuring a conscientious and sustainable approach to meet evolving enterprise demands.

DELIVERING INNOVATION AND SAFETY

Leveraging global knowledge as well as insights from the local market, STT GDC India has been innovating on multiple fronts. The company's technology advancements in design and build, featuring tools like BIM LOD 400/500 models, enable faster, error-free facility construction. A replicable integrated programme management ensures on-time project delivery, recognised as a best practice.

The unwavering safety-first culture of the company, certified by ISO 45001, has resulted in zero serious injuries. With over 19 years of expertise, operations excellence and sustainability initiatives, including large-scale PPAs and pioneering technologies like Liquid Immersion and DLC Cooling, demonstrate the company's commitment to a carbon-neutral world by 2030.

ENSURING RELIABILITY AND AVAILABILITY OF SERVICES

At STT GDC India, reliability and availability are the cornerstones of the data centre services. The company ensure uninterrupted operations and up to 100% uptime through redundant systems, robust infrastructure, and stringent maintenance schedules. Its facilities boast multiple layers of backup power, diverse network connectivity, and high-tier cooling systems, minimising downtime risks.

Rigorous testing, predictive maintenance, and real-time monitoring enable proactive identification and swift

With a 30% revenue market share and strategic investments in 300MW IT power load, the company is contributing significantly to India's digital ecosystem.

resolution of potential issues. Additionally, highly skilled and dedicated teams ensure round-the-clock support and response to maintain service availability at all times. These measures collectively guarantee the reliability and resilience of data centre services to meet the critical needs of customers.

DRIVING SUSTAINABLE PRACTICES

STT GDC India remains dedicated to environmental sustainability, employing multiple strategies to reduce its carbon footprint. It is committed to leveraging renewable energy sources, with current levels meeting over a third of its energy needs, while aiming for 65-70% utilisation. The company has also pledged to make its data centre operations net carbon-neutral by 2030.

It has also invested in highly efficient liquid cooling for servers to boost energy efficiency and continually explore innovations like gas, dual fuel generators, and heat recovery solutions.

Alongside these efforts, the company's stringent electronic waste management adheres to eco-friendly disposal practices in line with regulations. Partnerships, such as Firmus Metal International, also reinforce the vision for sustainable practices, emphasising responsible waste disposal and promoting a reduced environmental impact. The company's continuous focus on enhancing Water Usage Efficiency (WUE) and Power Usage Effectiveness (PUE) underscores its commitment to minimising resource consumption while delivering reliable services.

ENABLING DATA SECURITY

The company has a robust multi-layered 24x7 security framework that safeguards its data centres from the perimeter to customer cages via physical and logical controls, surveillance systems, and cybersecurity policies at STT. Also, world-class health and safety policies generate a security-first culture that prioritises customer satisfaction.

To ensure resilience, the company employs infrastructure redundancies such as backup power, optimised cooling, and rigorous maintenance. To future-proof the ability to supply highly reliable and

available services the company continuously monitors crucial systems through IoT sensors across the data centre facilities.

CHALLENGES AND SOLUTIONS

In the dynamic data centre sector, managing and operating centres presents issues such as growing construction costs, prolonged delivery lead times (3-6 months), and increased competition. The inflow of new companies dilutes the sector, turning it into a real estate-centric business. The company, however, has been able to overcome these obstacles by emphasising on reliability, SLA and uptime track record, safety standards, compliance, ethics, security, and the financial stability of the service provider.

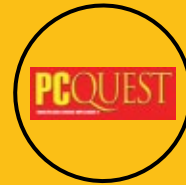
To address difficulties collectively, the company participates in collaborative efforts with industry bodies like CII, IGBC and ASSOCHAM, as well as MeitY and other government organisations. In a nutshell, the company employs experience, capabilities, and resources to handle these inherent challenges, delivering smooth support for customers on their digital journey.

STT GDC India has a robust expansion plan that entails doubling the national data centre capacity every 4-5 years to keep pace with the rising demands in India. The company currently operates 29 facilities amounting to over 300MW IT Load capacity across 11 cities, with large new greenfield campuses underway in Mumbai, Chennai and Kolkata.

Over the next 3-5 years, STT GDC India envisions investments exceeding USD 1 billion towards new builds and massive expansions of existing sites. This capacity growth allows the company to cater to edge computing needs while scaling core infrastructure. With long experience supporting digital transformation in India, STT GDC India's sustained investments in state-of-the-art, scalable, and secure facilities reinforce the company as the partner of choice amidst the country's data consumption boom. 🌱

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[INTERVIEW]

PATENTS



Gabriele Mohsler

Vice President – Patent Development (IPR & Licensing),
Ericsson

“Quality of patents is more important than timeliness”

As the Head of Patent Development at Ericsson, **Gabriele Mohsler** leads the global efforts in creating and enhancing the company's patent portfolio. While Ericsson has achieved over 60,000 patents, emerging as a company holding one of the strongest radio communication patent portfolios in the industry covering 3G, 4G and 5G cellular standards, Mohsler has also been driving the initiative of prioritizing quality over quantity. In an interaction with **Shubhendu Parth**, she shared insights into the framework and key pointers defining patent quality. She also talked about Ericsson's R&D philosophy and investments in India, the role of startups and MSMEs in driving technological innovation, and the IPR ecosystem in India. Excerpts:

There has been a shift in India's technological landscape over the past decade, from a focus on software patents to an increased emphasis on engineering and hardware products. How do you reflect on this change?

I think software is important, especially in the patent field. Most of the inventions at Ericsson—and we file around 2,000 patents every year—are software-related. It was the same even 10 years back; it had already evolved from hardware-centric innovations to a focus on software.

Overall, the contributions from the country have risen significantly, not just tied to hardware advancements but driven by the growth of software within the nation. During my last visit, just before the onset of the pandemic, and in the preceding years, there has been a consistent increase in these numbers. This growth is directly linked to increased R&D and technology investments in the country.

In terms of R&D investments in India, is it primarily from local companies or global entities like Ericsson?

I believe it is a combination of both. At Ericsson, we are committed to R&D in India, with 1,800 people actively contributing to research and development. The reason behind this commitment is the presence of excellent engineers and professionals in India who drive and develop technology and products. In that sense, it is

not entirely independent, as our investment in India is a testament to the trust we have in the country. Although we are an international company headquartered in Sweden, the decision to invest in R&D in India is rooted in the excellence of engineers and R&D professionals here.

Given India's rise as the 3rd largest ecosystem for startups globally, how do you perceive the role of startups and MSMEs in driving technological innovation, especially in the telecom sector?

I think startups need to invest in the technology and build use cases. While their R&D departments may not be as extensive as larger corporations, startups need to focus on technology. If they generate innovative ideas and technologies, disregarding intellectual property rights (IPR) momentarily, they can develop compelling use cases that will gain traction in the market. Having both engineering and entrepreneurial perspectives is vital in driving this innovation and discovering new, creative ideas. Subsequently, these ideas can evolve into tangible products for the market.

Is there a process through which Ericsson engages with these new entities, particularly MSMEs involved in R&D within the telecom sector?

We do not engage with startups as such. Our focus is on conducting our R&D here in the country, specifically in the development and deployment of our 5G products in the market. We, however, work with academia; for instance, we have signed an MOU with IIT-Chennai for Responsible AI. These collaborations, where our R&D centres are actively involved, form the foundation of our engagement strategy.

Are there any plans in response to the Government of India's announcement on Innovation Labs?

Internally, we are actively exploring this, but currently, there is nothing specific to share. We are aware of the announcement and are carefully considering it. Perhaps, by later next year, we will have more information to disclose.

Ericsson recently signed the EPO patent quality charter. What does it mean for the company and

how will it translate into benefits for the India R&D centre?

Thank you for the question because it was my initiative. We began with the fundamental belief that our focus should be on quality, not quantity. To elaborate, we scrutinised our patent portfolio, acknowledging our substantial 60,000 patents and an annual filing rate of 1,800 to 2,000. We recognised the value of this portfolio but insisted on maintaining a commitment to quality, recognising that quantity alone is insufficient.

Regarding the EPO Quality Charter, Ericsson is one of its founding partners. This initiative established an industry-wide commitment to quality patents, emphasising a dedication beyond mere numerical filings. Our self-commitment extends to encouraging the patent office to actively engage in discussions with us, striving collectively for better patents. For us, the quality of patents is more important than timeliness; it is enforceable patents that are really good. We want to build an understanding of this.

So, how does it apply to India? Our discussions with the patent office align with the existing IP Five offices (IP5), representing the global patent offices. We anticipate the emergence of IP Six with the Indian patent office; indicative of the serious consideration India receives from international patent offices. We aspire to contribute to the harmonisation and elevation of quality standards globally. This is a dialogue we intend to have with the patent office here, and I can confidently say that in India, our perspective is heard.

And how does the adoption of the EPO Quality Charter work in collaboration with the patent office?

The initiative is industry-driven, purely nonprofit, and self-motivated. We, as industry representatives, typically Chief Intellectual Property Officers (CIPOs) or lead counsels in companies, engage with the patent offices to explain what quality means for us and them. While our primary focus has been on the EPO due to identified needs, we are open to similar discussions with any patent office globally.

Can you elaborate on the framework and key pointers that define the quality of patents?

Key pointers for us include well-searched cases with clarity, ensuring an unambiguous definition of claims and scope. We emphasise the importance of clarity as the patent office's current approach sometimes lacks

enforceability due to unclear language. Additionally, we advocate for thorough searches to prevent unexpected prior art challenges, which can be costly for startups investing in patents. Our emphasis is on complete prosecution, including examination, before granting.

We are not there to say you need to grant us a patent. We are there to ask for quality patents. Companies that are looking to achieve high numbers of patents are not part of this quality charter; Ericsson also has high numbers and is part of the top 10, but we are not aiming for a volume game. Our quality demand contrasts with the current approach where timeliness is considered a measure of quality. The push for faster grants compromises the depth of examination, resulting in lower quality.

Are there specific parameters for evaluating the usefulness of patents?

Usefulness is evaluated based on whether patents read on a product or standard, focusing on enforceability and the novelty of patentability aspects. We do not want to have something in our portfolio that ends up becoming invalid because another publication or patent existed before. Hence, a complete search is essential. I know that the Indian Patent Office made its whole documentation available to the other patent offices to enable them to search. And that is very important. I am responsible for over 60,000 patents at Ericsson and the majority or nearly all of our portfolio is strong and enforceable; any patent found lacking is pruned. We recently conducted a significant pruning to remove patents that were not useful due to existing prior art.

Experts also point out that commercialisation of Standard Essential Patents (SEPs) may be useful for Indian startups in R&D. Can you elaborate on the potential benefits of this approach, especially for startups lacking production capabilities?

Production and patents are detached from each other, and for startups, creating a patent involves engaging in strong R&D. One needs to have good technology and work on it; a patent is always an accompanying product of strong R&D. In the case of Ericsson, the patent is a natural byproduct of our R&D investments to drive elite technology. Commercialisation is not the front end. However, if the technology is good, we commercialise it for a fair return on investment.

Our 5G products and portfolio exemplify this synergy. While commercialisation is important, the primary

“ We emphasise the importance of clarity as the patent office’s current approach sometimes lacks enforceability due to unclear language.

focus is on developing cutting-edge technology. For startups, having a strong patent, regardless of product presence, allows for licensing opportunities. Even if it later becomes a SEP patent, the focus should always be on technology development.

Can you provide insights into the significance of licensing within the global standardisation ecosystem, particularly in the context of ongoing investments in innovations like 6G, and how this contributes to fostering collaboration?

Currently, we are actively licensing our 5G patents, with ongoing discussions for new agreements. Simultaneously, we are investing in 6G and advancing 5G technologies. The licensing income generated allows us to afford these substantial investments in new R&D and technology for the upcoming years. The entire licensing narrative and standardisation are built on collaboration; it is not about one company driving a standard.

We encourage collaboration and let technology developments unfold organically. We do not push specific technologies from the IPR side; instead, we foster collaboration and later assess if we have patents related to those collaborative efforts. In Ericsson, this approach works seamlessly, with a wealth of patents supporting collaboration, and it extends beyond major competitors to include startups globally. Whether it is a startup from India or elsewhere, if they bring strong technology ideas to the standardisation process, we are open to collaboration. The essence is good technology fostering collaboration, and if such a company holds a patent, it enhances the collaboration further.

And what are the key technologies or areas that Ericsson is currently working on in terms of patents?

The process is driven by the technology Ericsson develops, and patents follow suit. For example, our CTO decides to involve AI, and then we work on patents related to AI. It is not a case of deciding to have patents in AI and then developing AI. Good patents follow good

technology. Our primary focus areas include radio technology, telecommunications, and newer areas like AR and VR. The company’s technology councils drive decisions, and we align our patenting efforts with the company’s technology focus. It is a natural progression where technology comes first, and patents support and protect that technology.

Is Ericsson involved in any work related to Industry 4.0?

In Germany, we have a campus actively engaging with industries to create connected ecosystems. This involves dedicated networks, and we have a showcase in collaboration with the University of Aachen. We provide products to companies looking to connect their robots and sensors. Our involvement extends to working with Fraunhofer, and we are actively exploring industrial deployment, especially in the area of dedicated networks. The company is currently assessing business opportunities in this domain, and our dedicated networks allow companies to create connectivity for their factories.

As the driver of the patent initiative at Ericsson globally, how do you compare India’s IPR regime with the rest of the world?

India’s IPR regime has taken significant strides forward. In the past, we faced lengthy delays in case examinations, leading to uncertainty. However, the current scenario sees fast grants with good quality. There is an effort to harmonise results across different locations like Chennai and Delhi.

The Patent Office, through the hiring of numerous examiners, has expedited processes, and while the speed is impressive, it does not compromise the quality of decisions. We observe a keen interest among examiners in the field, contributing to good technology development. The strides made reflect a positive evolution in India’s IPR landscape. 🙌

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ENHANCING DATA CENTRE MANAGEMENT FOR BETTER SERVICE ASSURANCE

Data analytics, AI, and ML play crucial roles in optimising data centre performance and efficiency. Here's how these technologies contribute



BY GIRISH DHAUALE, CTO, DATA CENTRE SERVICES, SIFY TECHNOLOGIES LTD.

Data centres have emerged as a crucial component of the IT infrastructure of businesses. They handle vast amounts of data generated by various sources, and over the years have transformed into massive and complex entities. Of late, data analytics has emerged as a necessary ally for data centre service providers, powered by the growing need to improve parameters like operational efficiency, performance, and sustainability. In this blog, we will discuss the different ways in which data analytics and AI/ML can help enhance data centre management and empower data centre service providers to deliver better service assurance to end customers.

How data analytics and AI/ML can help service providers in data centre optimisation

Today, data centre service providers are leveraging data analytics in various ways to optimise data centre operations, reduce costs, enhance performance, reliability and sustainability, and improve service quality for customers. They employ a variety of methods to collect data from colocation, on-premise and edge data centres, which include physical RFID/EFC sensors, server, network and storage monitoring tools, security information and event management (SIEM) systems, configuration management databases (CMDBs), API integration, and customer usage data. The data collected

is then fed into a centralised monitoring and analytics platform, which uses visualisation tools, dashboards, and alert systems to analyse the data and generate insights.

Furthermore, by integrating IoT and AI/ML into data centre operations, service providers are gaining deeper insights, automating various processes, and making faster business decisions. One of the most critical requirements today is for analytical tools that can help with predictive assessment and accurate decision-making for desired outcomes. This is achieved by diving deep into factors such as equipment performance, load demand curve, and overall system performance, as well as intelligent risk assessment and business continuity planning. Selection of the right tools, firmware, and application layer plays a major role in making such an AI/ML platform successful.

The relationship between analytics and automation from the perspective of data centres is rather symbiotic. Data centres are already automating routine tasks such as data cleaning, data transformation, and data integration, helping data centre service providers free up resources for more strategic analytics work, such as predictive modelling, forecasting, and scenario planning. In turn, data analytics provides valuable insights that enable data centres to implement intelligent automation and optimisation techniques. This may include workload balancing, dynamic resource allocation, and automated incident response.

Here are some of the key areas where data analytics and automation have a significant impact:

- **Enhancing operational reliability:** Data analytics, AI/ML and automation can enable data centres to ensure optimal performance. This involves using predictive maintenance, studying equipment lifecycles for maintenance, and incident history analysis to learn from past experiences. In addition, AI/ML-driven vendor performance evaluation and SLA management incorporating MTTR and MTBF further strengthen operations. Leveraging these metrics within the ITIL framework helps data centres gain valuable operational insights and maintain the highest levels of uptime.
- **Performance efficiency:** Data centres consume a substantial amount of energy to power and maintain desirable operating conditions. To optimise services, track hotspots, prevent hardware failure, and improve overall performance, modern data centres analyse data points such as power usage, temperature, humidity, and airflow related to servers, storage devices, networking equipment, and cooling systems. Prescriptive analytics can take this a step further by

providing recommendations to optimise utilisation and performance.

- **Predictive maintenance:** Predictive analytics is a powerful technology that uses data to forecast future performance, identify and analyse risks and mitigate potential issues. By analysing sensor data and historical trends, data centre service providers can anticipate potential hardware failures and perform maintenance before they escalate, with advanced predictive analytics enabling them to improve equipment uptime by up to 20%.
- **Capacity planning:** Businesses today must be flexible enough to accommodate capacity changes within a matter of hours. Data centre service providers also need to understand current usage metrics to plan for future equipment purchases and cater to on-demand requirements. Data analytics helps in optimising the allocation of resources like storage, compute, and networking while meeting fluctuations in customer needs and improving agility.
- **Security and network optimisation:** Data centres can use analytics to monitor security events and detect vulnerabilities early to enhance their security posture. By analysing network traffic patterns, data analytics tools help identify unusual activities that may indicate a security threat. They can also monitor network performance, identify bottlenecks, and optimise data routing.
- **Customer insights:** Datacentres collect usage data, such as the number of users, peak usage times, and resource consumption, to better understand customer needs and optimise services accordingly. Analytics helps providers gain insights into customer behaviour and needs, enabling them to build targeted solutions that offer better performance and value. For example, through customer-facing report generation, organisations and end-customers can gain valuable insights and optimise their operations. Additionally, analytics accelerates the go-to-market process by providing real-time data visibility, empowering businesses to make informed decisions quickly and stay ahead of the competition.
- **Environment sustainability and energy efficiency:** Data centres have traditionally consumed significant power, with standalone facilities consuming between 10-25 MW per building capacity. However, modern data centre IT parks now boast capacities ranging from 200-400+ MW. This exponential growth has led to adverse environmental impacts, such as increased carbon footprint, depletion of natural resources, and

” AI/ML modelling can help data centres achieve 8-10% saving on PUE below design PUE – helping to balance environmental impact with an efficiency better than what was originally planned.

soil erosion. Using AI/ML, performance indicators like CUE (Carbon Utilisation Effectiveness), WUE (Water Utilisation Effectiveness), and PUE (Power Utilisation Effectiveness) are analysed to assess efficiency and design green strategies, such as adopting renewable energy, implementing zero water discharge plants, achieving carbon neutrality, and using refrigerants with low GHG coefficients. For example, AI/ML modelling can help data centres achieve 8-10% saving on PUE below design PUE – helping to balance environmental impact with an efficiency better than what was originally planned.

• **Asset and vendor performance management:**

The foundation of the AI/ML platform lies in the CMDB, which comprises crucial data, including asset information, parent-child relationships, equipment performance records, maintenance history, lifecycle analysis, performance curves, and end-of-life tracking. These assets are often maintained by OEMs or vendors to ensure reliability and uptime. AI/ML aids in developing availability models that factor in SLA and KPI management. It can provide unmatched visibility into equipment corrections, necessary improvements, and vendor performance. It can also help enhance project models for expansion build-outs and greenfield designs, accurately estimating the cost of POD (point of delivery) design, project construction, and delivery.

- **Ordering billing and invoicing:** AI/ML plays a vital role in enhancing the efficiency and effectiveness of order, billing, and invoicing processes. Its impact spans various stages, starting from responding to RFPs to reserving space and power, managing capacity, providing early access to ready-for-service solutions, facilitating customer onboarding, and overseeing the entire customer lifecycle. This includes routine processes such as invoicing, revenue collection, order renewal, customer Right of First Refusal (ROFR) management, and exploring expansion options both within and outside the current facility.

Selecting the right data analytics solution

The implementation of data analytics and automation through AI/ML requires careful consideration as several parameters, such as data quality and level of expertise play a crucial role in delivering efficient end results. To

succeed, businesses need to choose user-friendly and intelligent solutions that can integrate well with existing solutions, handle large volumes of data, and evolve as needed.

At Sify – India’s pioneering data centre service provider for over 23 years, we continuously innovate, invest in, and integrate new-age technologies like AI/ML in operations to deliver significant and desired outcomes to customers. We are infusing automation led by AI/ML in our state-of-the-art intelligent data centres across India to deliver superior customer experiences, increased efficiency, and informed decision-making, resulting in more self-sustaining and competitive ecosystems. For example, leveraging our AI/ML capabilities has been proven to lead to over 20% improvement in project delivery turnaround time. Our digital data centre infrastructure services offer real-time visibility, measurability, predictability, and service support to ensure that our customers experience zero downtime and reduced Capex/Opex.

How do Sify’s AI-enabled data centres impact your business?

- **Person-hour savings:** Automation of customer billing data and escalations resulting in up to 300 person-hour savings in a month.
- **Reduction in failures:** Predictive approach for maintenance and daily checks yielding up to 20% reduced MTBF, 10% improved MTTR, and 10% reduction in unplanned/possible downtime.
- **Cost savings:** Improved power/rack space efficiency and savings on penalties to deliver up to an 8% reduction in customer penalties by maintaining SLAs and a 10% reduction in operating cost.
- **Compliance adherence:** Meeting global standards and ensuring operational excellence and business continuity.



To know more about our world-class data centres and how they help enterprises achieve positive business outcomes, scan the QR code.

A fresh epoch for the communication sector

The Telecom Act 2023 marks a significant stride in India's telecom sector drawing upon various aspects of similar global regulations



BY JAIDEEP GHOSH

India has achieved a significant milestone with the enactment of the Telecommunications Act of 2023, supplanting the antiquated Indian Telegraph Act of 1885 and archaic regulations. This progressive legislation aims to revolutionise the telecom landscape, attract investments, and pave the way for a dynamic era of digital connectivity. Let us delve into its key features, potential impacts on the industry, areas necessitating clarity, and a

comprehensive comparison with analogous regulations in diverse geographies.

IMPACT ON THE INDUSTRY

The Act's streamlined regulatory environment and emphasis on digital infrastructure are poised to attract substantial investments, fostering sectoral growth and employment. While the entry of new full-scale telecom operators seems improbable, fresh investments in satellite

Similar to the US and EU, India encourages foreign and domestic investments, balancing competition with consumer protection.

INTERNATIONAL PERSPECTIVE

	USA Telecommunications Act 1996	PRC (China) Telecommunications Regulations (2016)	EU Electronic Communications Code 2018	Indian Telecommunications Act 2023
Objective	Deregulation, competition, universal service	Facilitate high growth with State control	Consumer protection, high-speed networks, fair competition	Facilitate investment, spectrum management, consumer rights, dispute resolution mechanism
Key Features	Breakup of Bell System, cable market deregulation, interconnection requirements	Licensing framework, foreign investment restrictions, data security and privacy, content control.	High-speed network access, fair competition, consumer protection, net neutrality	Affordable broadband access, spectrum allocation, consumer protection, cybersecurity, quality of service.
Licensing	Reduced barriers, ownership restrictions loosened	Strict control, foreign investment limitations	Streamlined framework, spectrum licensing	Single authorisation framework, investment encouraged
Interconnectivity	Mandatory for competition	Mandatory, regulated by the Government	Interconnection agreements	Operator responsibility, light regulatory oversight
Regulation	Focuses on market forces and competition to drive innovation.	Strong government oversight, data security emphasis	Harmonised EU-wide framework, blends market principles with consumer protection and public interest goals.	Independent regulator, government control in instances of national security and public safety
Competition	Encouraged through deregulation	Limited by state control, licensing	Fair market rules, market entry facilitation	Fostered through simple authorisation, infrastructure sharing
Consumer Protection	Limited provisions, Universal Service Fund	Emerging focus, some protections	Strong emphasis, transparency, switching rights	Consumer choice, tiered dispute resolution mechanism
Data Security and Privacy	Limited requirements, industry-driven	Government control, strict data localisation	Harmonised EU regulations, GDPR compliance	Portfolio of regulations covering IT, data protection, media and telecom.
Content Control	Limited government control over content, but some provisions for indecency and copyright protection.	Broad government authority, internet censoring and filtering	Balanced approach, illegal content removal	Intermediary liability, content blocking powers under specific circumstances
Network Investment	Private sector driven	State-led and private participation	Private investment, Harmonised spectrum management, investment incentives	Private led Infrastructure development focus, spectrum allocation reforms, infrastructure sharing. Supplemented by government operators and initiatives such as Bharat Net optical fibre backbone.
Challenges	Maintaining balance between competition and public interest, net neutrality concerns and disputes due to political stance, data privacy protection regulation emerging.	Balancing economic development with individual rights and freedoms, ensuring fair competition in a state-controlled market.	Implementing regulations effectively across diverse member states, addressing concerns about net neutrality and data privacy.	Treatment of OTT and convergence services, ensuring effective spectrum management, cyber security and addressing potential regulatory overlaps.

The Act takes a balanced approach between private sector investments and government control, especially for national security.

services and infrastructure are imminent. Additionally, it paves the way for new entrants in niche segments.

The Act's clarity in various areas, such as spectrum allocation for satellite communication services, is anticipated to expedite decision-making among service providers and ecosystem participants. This could result in accelerated growth within the sector.

Improved connectivity, enhanced service quality, and potentially lower tariffs, particularly in rural areas, are foreseeable outcomes due to streamlined processes and heightened competition. The Digital Bharat Nidhi funds could further innovation and rural coverage.

However, the expanded government powers for surveillance, data access, and biometric verification necessitate robust processes and safeguards to protect individual liberties.

AREAS OF CONCERN

While the Act excludes OTT, concerns persist that its broad definition of telecom services (transmission, emission, or reception of any messages through wire, radio, optical, or other electromagnetic systems) could inadvertently encompass certain communication-focused OTT platforms in specific instances.

Clarity is needed regarding the distinction between the new authorisation framework and the existing licensing system.

The Act is applicable to offences committed outside India if it involves a telecommunication service provided in India or telecommunication equipment or network located in India. There is a need for clarity on how this may be implemented in today's era of cyber threats.

KYC through verifiable biometric based identification could slow the growth of subscriber onboarding and may lead to cyber security issues relating to storage and usage of subscriber biometric information. Besides, this will be difficult to implement for enterprise customers.

Other concerns about potential regulatory multiplicity/overlaps and overreach, spam control effectiveness, and

cybersecurity persist, urging the need for clear guidelines and effective implementation.

INTERNATIONAL COMPARISON

The new Act is contemporary and forward looking. It considers the real issues associated with the rapid growth of the telecom and technology sectors, infrastructural constraints, the converging nature of products and services, and blurring of industry boundaries. The Act draws upon various aspects of similar regulations prevailing globally and incorporates several leading practices.

The Act takes a balanced approach between private sector investments and government control, especially for national security.

Similar to the US and EU, India encourages foreign and domestic investments, balancing competition with consumer protection, while China emphasises stringent state control. In terms of data security and censorship, the EU leads with strong regulations, the USA relies more on industry efforts, China enforces strict control, and India adopts a nuanced approach, reflecting a convergence of diverse global practices.

A broad comparison of the telecommunications regulations in the US, China, the European Union, and Indian Telecommunications Act is provided here (see table International Perspective)

In summary, the Telecommunications Act 2023 marks a significant stride in modernising India's telecom sector. The success of the Telecommunications Act 2023 hinges on effective implementation, clear rules and guidelines, and addressing concerns within the prevailing and forthcoming digital regulatory framework.

The fair execution of this Act is pivotal. The evolution of this new framework and its lasting impact on the industry warrant close observation. 🌟

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Telecom Bill 2023: Promise and challenges

The new Bill establishes a policy framework that incentivises innovation and expedites the provision of new-age services in India



BY MANOJ CHUGH & SHYAM SUNDER

The telecom sector has played a significant role in the growth and development of India. It has helped to employ four million people. It serves 117.9 crore subscribers, contributing to 6% of GDP, growing at a CAGR of over 9%.

The current telecom framework is based on three outdated laws dating to the 19th century that badly need an overhaul, given the rapid technological advancements, the advent of next-generation services pivoted on digital, and the fast-changing demands of our citizens. The government's focus on digital public infrastructure requires the underpinning of a modern, robust, and secure telecom infrastructure while leveraging the current momentum in the sector.

The introduction of the Telecom Bill 2023 seizes an opportunity, providing clarity for all stakeholders. The Bill establishes a policy framework that incentivises innovation and expedites the provision of new-age services.

The Bill's focus can be categorised into four main areas. Firstly, modernisation and streamlining have led

to the removal of over 100 compliance burdens, updating the legal framework, simplifying licenses and procedures, and fostering competitiveness for a more dynamic regulatory environment.

Secondly, infrastructure development aims to create a conducive environment for expansion, incorporating provisions for streamlining 'Right of Way' acquisition, offering financial incentives for private investment, and implementing measures to optimise spectrum usage and allocation.

Thirdly, national security and public safety provisions empower the government to manage telecom networks during emergencies, authorising lawful interception and surveillance under specific circumstances. It emphasises safeguarding national security and public safety while addressing concerns about potential misuse and privacy violations.

Lastly, consumer protection and balancing interests aim to address user concerns by establishing grievance redressal mechanisms and outlining data privacy

The benefits of the Indian Telecom Bill 2023 for the Indian economy are significant, but they must be weighed against the potential downsides.

provisions. This approach strives to balance innovation and competition with consumer protection and the safeguarding of user rights.

DRIVING NEW TECHNOLOGY GROWTH

A key aspect of the Bill includes a focus on emerging technologies which acknowledges the evolving nature of the sector and strives to adapt to future advancements and focus on the digital economy. Its focus on future-proofing and adaptability could provide a supportive environment for 6G research and development, paving the way for next-generation technologies that leverage Artificial Intelligence (AI) extensively.

Infrastructure development fueled by the Telecom Bill 2023 could contribute up to 1.5% to India's annual GDP growth by 2025. This translates to a potential gain of Rs 5.6 lakh crore per year. Similarly, expanding access and affordability of digital services through improved connectivity could unlock an additional Rs 3.4 lakh crore in gross value added to the Indian economy by 2025. The telecom sector and related industries could see significant job creation, potentially adding up to four million new jobs in the next few years.

The potential benefits of the Indian Telecom Bill 2023 for the Indian economy are multifaceted. New Age Services catalysed around Satellite Communications could see a major impetus. The Bill acknowledges future technological changes but anticipating the full impact of the evolving nature of telecommunications is not easy. Imbibing established international best practices in areas like privacy and regulation could go a long way in positioning India's Leadership on Regulation.

The process of implementation, the Rules, and potential amendments require active engagement with all major stakeholders, both, large and small, to help ensure seamless implementation. Concerns will have to be addressed as the Rules are framed.

BRIDGING THE DIGITAL DIVIDE

In terms of inclusiveness and affordability, how effectively Digital Bharat Nidhi will bridge the digital divide between rural and urban areas remains to be seen. Underserved communities have to be brought into the mainstream as soon as possible.

Measures for ensuring affordable access to digital services and data plans, particularly in the less-served rural areas, have to be addressed on priority. While offering grievance redressal mechanisms, the Bill might need stronger provisions to effectively protect consumer rights and interests against potential unfair practices.

The "Do Not Disturb" Registry needs to be enforced. India has led Net Mobile Subscriber Additions consistently over the last few years. With the requirement of users to now provide verifiable biometrics-based identification to avail of services, there could be a direct impact on subscriber growth and concerns around Privacy.

Whilst telecommunication services have been well defined and the sourcing of networks and services rightfully limited to trusted sources only, new-age service providers may look for additional support or exclusions from some of the stringent provisions. Potential concerns including those around overzealous centralised control may impact private investment. Clarity on the oversight of OTT platforms in the Bill needs to be provided. Broad surveillance powers raise natural concerns about potential misuse. An independent oversight mechanism, like the one implemented in some developed countries, may help.

The potential benefits of the Indian Telecom Bill 2023 for the Indian economy are significant, but they must be weighed against the potential downsides. Addressing concerns about government overreach, surveillance, privacy, inclusivity, and future-proofing will be crucial to ensure the Bill's effectiveness and maximise its positive impact on the economy.

Ultimately, the Bill's success will depend on its quality, implementation transparency, and ability to address concerns while adapting to the evolving economic and technological landscape. 🌐

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TV RAMACHANDRAN

USHERING IN THE ERA OF INDIAN TELECOM RESURGENCE

The new Telecom Act addresses key issues hindering the sector's growth, paving the way for innovation, investments, and better customer services



The Telecommunications Act, 2023 which replaces the 138-year-old Indian Telegraph Act of 1885 and two other Acts, represents a milestone in India's telecom sector. It signifies the elevation of digital communications, addressing key issues that previously hindered sector growth, and propelling it to new heights of performance potential.

CLARITY ON SPECTRUM ASSIGNMENT

One of the primary features of this Act is that it provides open, transparent, and clear guidelines for the assignment of radio frequency spectrum for the first time in nearly

30 years since the opening of the telecom sector. The spectrum, the lifeblood of the sector, has unfortunately been the source of numerous heartaches, disputes, and controversies that have plagued the industry. The Act eliminates all uncertainty while clearly outlining directions for transparency and predictability in the assignment of various types of spectrums for different applications or end uses. It effectively provides clarity on what can and cannot be auctioned.

While the Supreme Court judgment in the 2G spectrum matter was considered a necessary course correction for

“

The decision to assign spectrum administratively for Satcom is a hugely positive one, aligned with international best practices



Recognising the need for a comprehensive review, the Act takes a transformative step by evolving the USO Fund into the Digital Bharat Nidhi.

the sector, it has unfortunately led to an unending stream of debates, discussions, and non-reasoned arguments. Despite a Presidential reference to the Supreme Court for clarifications and a clear advisory judgment from the apex court, needless debates have persisted.

This Act now settles matters once and for all by strongly affirming, in line with the Supreme Court judgment, that auction is generally the preferred method of assigning spectrum, except for three exceptional areas requiring administrative assignment for specific reasons. These areas include public interest services, government services, and areas infeasible for auctioning due to techno-economic reasons. In the case of satellite communications, auctioning is infeasible because the same spectrum is used by multiple operators in different orbital slots.

This rule also applies to point-to-point backhaul spectrum and WiFi spectrum, as they logically fall into this category, being reusable by the same as well as different users. Additionally, WiFi falls into the category of public interest services. In all such cases, the Act [sections 4 (4), (5), and 57 (1) and the First Schedule] enumerates 19 applications, sub-areas, and use cases given in Schedule 1, which are to be assigned spectrum through the administrative process.

The decision to assign spectrum administratively for Satcom is a hugely positive one, aligned with international best practices. It will tremendously boost investor confidence, significantly increasing the inflow of both international (FDI) and domestic investment to the sector. Furthermore, it will not only spur the mainstreaming of established Satcom players but also boost the spirits of the entire Satcom industry, including a large number of indigenous space startups. Additionally, regulatory and policy certainty for the assignment of spectrum for various other areas and applications for public utility, such as public Wi-Fi and telecom backhaul for long-distance applications, particularly in rural areas, will be extremely useful in the context of inclusive connectivity for all 6.4 lakh+ villages for Bharat Net.

India has a greater need for satellite-based communication than other developed countries

and regions due to vast geographically challenging terrains. However, it has only one-third of its Asian peers' satellite connectivity per capita and only one-twentieth or even lower than that of Europe and the US. The Act, working in tandem with the latest Space Policy, will provide a significant shot-in-the-arm to the Satcom sector, boosting the digital dreams of the country to accelerate socio-economic development in an all-inclusive manner.

CLARITY ON THE TREATMENT OF OTT

The Act introduces a significant reform for the Over-The-Top (OTT) sector, marking the second major area of focus. OTTs, being Internet products, have traditionally fallen under the jurisdiction of the Ministry of Electronics and Information Technology (MeitY). They have been subject to regulatory oversight by MeitY and governed by the IT Act, along with the associated rules and guidelines. Under this regulatory framework, the OTT sector has flourished, witnessing substantial growth, evidenced by the remarkable milestone of 22 billion OTT/App downloads in 2022 – one of the highest globally, attracting attention from various international regimes.

However, in recent years, certain vested interests have sought to create confusion by advocating for the regulation of OTTs similar to telecom services. Both the Telecom Regulatory Authority of India (TRAI) and the Department of Telecommunications (DoT) have consistently emphasised that OTTs and telecom are not comparable. OTTs operate in the application and content layer, while telecom functions in the network layer, enjoying exclusive rights such as interconnection, interference-free spectrum, Right of Way (RoW), unique numbering resources, and the right to establish core and transmission networks. Despite these distinctions, the confusion persisted due to the lack of legislative direction, which the Act now addresses.

The Act unequivocally excludes OTTs from its purview, with no mention of them anywhere, in contrast to the earlier version.

It is noteworthy that concerns regarding the impact of the Telecom Bill on broadcasting have been conclusively addressed in the final Act, which does not encompass

To safeguard existing digital infrastructure, punitive measures are introduced under the new law against acts of theft or vandalism.



IN BRIEF

- The Act brings transparency by providing clear guidelines for radio frequency spectrum assignment, eliminating uncertainties.
- Strategic decisions on satellite communication spectrum assignment, are expected to boost investor confidence and accelerate inclusive connectivity.
- The Act excludes OTT services from telecom regulations, emphasising legislative clarity, stimulating innovation, and ensuring exclusive governance by MeitY.
- There is a shift from hard licensing to a modern system of authorisations to simplify the processes and enhance the ease of doing business.
- The transformation of the USO Fund into Digital Bharat Nidhi aims to support universal service, research, and pilot projects.

broadcasting. This resolution brings significant relief to the broadcasting sector.

LICENSING THROUGH AUTHORISATION

For decades, the spectre of hard licensing has cast a shadow over the sector, hindering it in both direct and indirect ways. The Act commendably addresses this issue by replacing the outdated framework with a modern and facilitating system of Authorisations, akin to systems in many advanced Western regimes. The existing system, which involves approximately one hundred different types of licenses with various constructs like license, registration, permission, and authorisation, is streamlined into a simpler construct for three aspects: providing telecommunication services, operating and expanding telecommunication services, and possessing radio equipment. Notably, OTT and Broadcasting Services are excluded from this list.

Currently, the licensing process involves cumbersome documentation spanning hundreds of pages. In contrast, the process of authorisation will result in a concise and worded document. This represents a significant leap forward in the administration of Indian Telecommunications, promising to enhance the Ease of Doing Business and instil confidence among all stakeholders.

DRIVING DIGITAL BHARAT NIDHI

Established on 1 April 2002, the Universal Service Obligation Fund (USOF) initially aimed to support the provision of telecom services to unconnected and underserved areas. However, as time progressed, it appears that the USOF has become inadequately attuned to modern requirements, resulting in the accumulation of a substantial corpus of unutilised funds. Recognising the need for a comprehensive review, the Act takes a transformative step by evolving the USO Fund into the “Digital Bharat Nidhi” under the control of the Central Government.

The new mandate of Digital Bharat Nidhi encompasses several key objectives. Firstly, it seeks to support universal service by promoting access to and delivery of telecommunication services in underserved

The Act gives a further impetus to innovation and technology development by legislating the establishment of suitable regulatory sandboxes.

rural, remote, and urban areas. Secondly, it aims to foster research and development of telecommunication services, technologies, and products. Additionally, the fund is empowered to support pilot projects, provide consultancy assistance, and offer advisory support toward the provision of services in the specified areas. Lastly, Digital Bharat Nidhi is tasked with supporting the introduction of telecommunication services, technologies, and products.

This strategic evolution aims to revitalise the fund, ensuring its relevance to contemporary needs and empowering it to play a more dynamic role in driving digital connectivity across diverse regions in the country. The Act gives a further impetus to innovation and technology development by legislating the establishment of suitable regulatory sandboxes.

PROTECTING THE CUSTOMERS

The Act introduces crucial measures to safeguard users or customers. Firstly, the 'Do Not Disturb' or DND register is granted a legal mandate to shield users from unsolicited commercial (spam) messages and calls. Additionally, an online grievance redressal mechanism is established to promptly address user grievances. The Act also designates the fraudulent acquisition of SIMs using someone else's identity proof as punishable under the law.

REFORMS TO STREAMLINE RIGHT OF WAY

The Act addresses long-standing challenges faced by operators in rolling out communication infrastructure, such as towers, optic fibre cables, and other network elements. It provides effective legislative backing to resolve these hindrances. Notably, it mandates time-bound permission for installation on public property. Moreover, it requires a mutual agreement between property owners and those intending to set up telecom networks on private property.

It also facilitates the establishment of common ducts in telecom infrastructure for networks and designates the District Magistrate and/or the District Judge for dispute resolution. To safeguard existing digital infrastructure, punitive measures are introduced under the new law against acts of theft or vandalism. These provisions

aim to ensure uninterrupted digital connectivity, and as a consequence, the rollout of network infrastructure is expected to accelerate considerably.

CONTINUED FLOW OF REFORMS

In addition to the extensive reforms in various areas introduced by the new Telecommunications Act, a steady stream of significant reforms continues even after the Act. For instance, the ministry recently brought 37 additional telecom products under the Simplified Certification Scheme (SCS) from 1 January 2024, reducing certification time from eight to two weeks and significantly enhancing the ease of doing business.

This brings the total products under SCS to 49, with various charges for testing or evaluation either reduced or waived, reducing application costs by over 80% and alleviating the compliance burden on operators.

Another recent reform extends the scope of registration for standard-based and secured M2M and IoT ecosystems. This allows various types of business entities, partnership firms, LLPs, institutions, etc., to apply for registration, further improving the ease of doing business and boosting investor confidence.

Indubitably, with the advent of the Telecommunications Act 2023, India is poised to develop increased momentum for moving to Digital Bharat through expeditious installation of digital infrastructure as well as an accelerated development of modern satellite communications as well as innovative internet applications and content. The sector is further enthused by the continued flow of reforms even after the Act.

An upward-spiralling effect on economic growth would inevitably result in accelerating the digital economy to USD 1 trillion and raising the Indian economy to the desired USD 5 trillion level. 🌟

The author is Hon. FIET (London) and President of Broadband India Forum.

Views are personal.

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Lt Gen AK Bhatt (Retd.)
Director General, Indian Space Association (ISpA)

“Satcom will not compete but complement terrestrial networks”

“We are always in orbit,” says Lt Gen AK Bhatt (Retd.), Director General of the Indian Space Association (ISpA), when asked about any downtime during the recent holidays. His modest remark takes on a more significant meaning as he elaborates on the complex flight paths he and his team have been navigating, in collaboration with the government’s propellers. In an interaction with Pratima Harigunani, he shares insights on various aspects of space and satellites, such as Satcom’s relevance with terrestrial incumbency, the progress and significance of space startups, key policy changes like FDI and spectrum, and global issues like space pollution and on-ground affordability. Excerpts from the interview:

ISpA has been actively involved in addressing crucial policy issues and advocating for various areas. With significant changes occurring in FDI and Satellite Spectrum, how satisfied are you with the progress being made?

We started almost simultaneously with the initiation of a new space policy by the nation. A major reform was the opening up of the space for private players. Initially, there were 10 policies, and they have now been condensed into three focus areas. This approach is more effective than scattering energy and work across multiple places. The private sector can now explore a wide range of areas, from communication to space debris to remote sensing. These are positive indicators of progress. FDI is also crucial as this sector involves substantial investments. With FDI, there will be a greater inflow of resources, and the government is effectively working on earmarking areas for direct approval and those requiring specific permissions. Direct approval would significantly facilitate many projects.

We are pleased that the Satcom spectrum has been considered for allocation administratively. The Telecom Bill has been a blessing. I consider it the government’s most forward-looking decision. This aligns with the global method of allocation, and our task now is to determine how to charge various players. India could

align itself with international standards, promote global cooperation, drive innovation, create opportunities for startups, and strengthen the country’s position in the global satellite market.

Is Satcom going to be better than terrestrial networks unequivocally? What about its inherent issues such as latency, interference, congestion, high power consumption, and orbital positioning?

Orbital positioning presents a challenge with GEO, but various constellations can be strategically placed at different planes and heights, mitigating this challenge. A significant advantage of Satcom over terrestrial networks is the ability to utilise spectrum for multiple users, unlike existing networks where a frequency band is limited to one user. Positioning angles can be diverse, contributing to the reduction of interference and congestion issues. Regarding costs, indeed, Satcom can be more expensive than terrestrial networks, especially when factoring in expenses for launching vehicles and deploying satellites. However, it offsets this by reaching remote areas untouched by current digital connectivity. We expect that the cost dynamics will change with the increase in volume. As of now, Satcom is costlier than terrestrial networks.

What about latency and power usage?

In the case of GEO, latency used to be a significant gap. However, as we move to lower orbits, latency improves significantly. While it may not compete with the levels of 5G, it has reached a point where the user experience is good. With a large number of satellites being launched, power issues are expected to be addressed as well. In short, Satcom is not intended to replace terrestrial networks but rather to complement them.

Can you elaborate?

Satcom adds value by reaching underserved and unserved areas where terrestrial networks face limitations. In areas where terrestrial networks are available, Satcom can function as a backhaul and enhancer of user experience.



India is making great progress through innovations such as satellites with de-orbiting capabilities and improved methods for refuelling satellites.

It does not replace existing technology; instead, it serves as a complement. While the future remains uncertain, for now, Satcom can prove beneficial in reaching places where fibre connectivity is challenging due to geographies and models. Today, broadband Internet is a necessity, not a luxury, and with Satcom's integration, sectors like IoT, agritech, insurance, and healthcare can experience significant advancements.

Is that aligned with what the recent ISpA-Deloitte-Nasscom report also touched upon; the role of start-ups in the downstream part of spacetech? How soon do you anticipate seeing a Space unicorn emerge?

When you see the global space economy, there is a huge potential for growth in applications, with launch vehicles accounting for only 7-8% of the total global space economy. Start-ups in the space sector, particularly those focused on deep-tech applications, represent a niche area. Currently, our start-ups are targeting promising segments, and within the next one or two years, we anticipate significant progress. Many of these start-ups have the potential to evolve into Unicorns. With the supportive environment from the government, once the first one emerges, it is likely to propel the entire industry forward. We are very confident of India's strengths, particularly in terms of the intellectual prowess and engineering culture showcased in the IT sector's success story.

India has an edge in reusable launch vehicles and low costs. Can we sustain that, especially when Elon Musk's Falcon 9 shows a similar global focus?

With the adoption of reusable rockets, the cost of launching a rocket and placing a satellite in orbit has significantly decreased. The progress is gradual but promising. India has the 'numbers' game in its favour when it comes to the cost-play. Additionally, there is notable progress in satellite miniaturisation, with transponders and satellite equipment becoming smaller; it is a trend observed globally.

How important does self-reliance (indigenisation) become here?

As far as the space sector is concerned, India has been

fortunate. The country's space program has a six-decade history, and it stands among the few spacefaring nations globally. Even when facing constraints due to global pressures, ISRO effectively developed independent strengths, such as cryogenic engines and capabilities for exploration of the Moon and Mars.

ISpA has signed several MOUs with organisations like CAPS, AGI, DRDO, and the French Aerospace Industries Association GIFAS. Can you share any insight into that?

ISpA is a premier industry association of space companies launched and we are actively involved in policy advocacy and engagement with all stakeholders in India's space domain. This includes collaboration with the government and its agencies to enhance India's self-reliance, technological advancement, and global leadership in space. Our mission revolves around the entire space ecosystem of India; we want to do everything and anything possible to create, add and enhance it.

We aspire for India to provide services not only for the nation but also for the global market. The space sector is very good at collaboration, both within India and with global entities. For instance, ISRO has established a robust supplier ecosystem, and new ventures are tapping into this indigenous network.

Are we effectively addressing the issue of pollution in Space, especially while dealing with satellite debris?

Space Pollution is a critical focus area, and India is diligently addressing it. From ISRO to other mechanisms, India is following global norms, demonstrating a stringent and careful approach. We are making great progress through innovations such as satellites with de-orbiting capabilities and improved methods for refuelling satellites. A satellite does not become useless because it gets old or gets rust. Rather, it is because the fuel gives away. We are getting closer to achieving fast refuelling and repairing capabilities. 🚀

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Stepping up the m-commerce game

With over 1.5 lakh merchants and 5 million transactions in Bengaluru alone, ONDC is transforming mobile-driven e-commerce in India



BY VERNIKA AWAL

In January last year, Open Network for Digital Commerce (ONDC), the Centre-backed initiative to create a Unified Payments Interface (UPI)-like protocol for decentralised e-commerce in India, was opened for public operations in Bengaluru. At the time, the framework was witnessing a fairly light transaction load of around 1,000 transactions every month. These transactions were largely around grocery deliveries in small-ticket transactions.

As 2023 drew to an end, ONDC transactions surged to hit the 5-million-mark monthly transactions in Bengaluru itself, where its first phase of deployment is playing out. ONDC, in its own right, had diversified and

evolved from facilitating grocery deliveries to food, and most importantly, mobility.

This evolution showcases the power of ONDC—the next-generation e-commerce democratisation effort by India that can create a first-of-its-kind framework for all of the world. In turn, it showcases what it may mean for mobile-driven e-commerce in one of the world's largest markets, and just like UPI, ends up drawing global interest in its model being replicated as a digital public infrastructure (DPI) around the world.

WHAT IS ONDC?

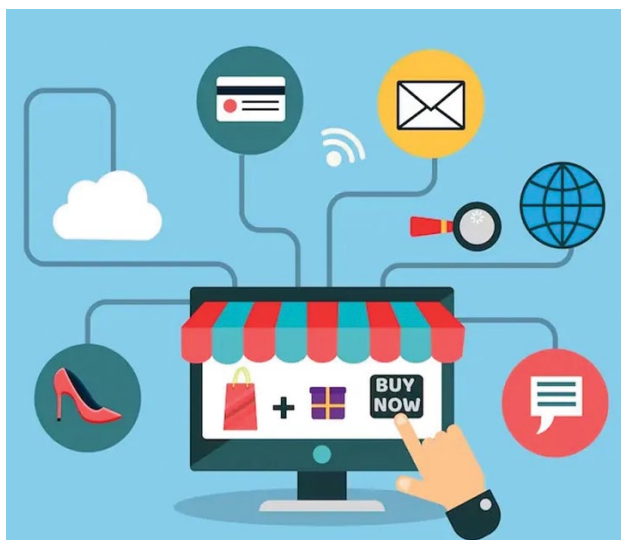
As explained by its Managing Director and Chief



“ONDC is not an app or a private, walled entity. It operates as a protocol that brings together a network of merchants, service providers, and users.”

Thampy Koshy

Managing Director and Chief Executive Officer, ONDC



IN BRIEF

- ONDC, a protocol connecting merchants and users, is poised to democratise mobile-driven e-commerce operations across India.
- Google and Meta's recent partnerships signify ONDC's potential, integrating services like metro ticket bookings and e-commerce access through WhatsApp.
- Crossing five million monthly transactions in December 2023, ONDC aims for 1.2 billion monthly transactions by 2027.
- While ONDC currently operates without fees, a nominal charge is anticipated for technical maintenance as it scales.
- Its non-intermediary status reduces operating technology infrastructure costs.

Executive Officer, Thampy Koshy, in a recent media conference in Delhi, ONDC is not an app or a private, walled entity. Instead, it operates as a protocol that brings together a network of merchants, service providers, and users. In simpler terms, ONDC functions as an intermediary network connecting two entirely separate private companies.

Hypothetically speaking, ONDC could one day enable individuals to choose a local grocery store and have their required items delivered to their homes through a logistics operator of their choice. For transportation needs, users could directly connect with a cab driver and book their services for a specified fee. This concept is akin to Uber but without the regulated, walled garden of pricing that Uber employs. Unlike Uber, booking a cab through ONDC would also mean avoiding the platform fee typically bundled into Uber's pricing. Consequently, this could result in more direct business for the cab driver and more affordable services for users.

In both examples mentioned above, ONDC serves as a facilitating protocol, that helps users in finding the right connections they need. No wonder then, ONDC is being positioned as a service capable of democratising all mobile-driven e-commerce operations across the country. The protocol is inherently mobile-first, with its services accessible through popular platforms such as Paytm and PhonePe, among others.

WHERE DOES IT STAND?

As indicated by Koshy, ONDC has crossed five million monthly transactions as of December 2023. Separate reports have stated that ONDC projects itself to cross 1.2 billion monthly transactions by 2027, less than four years from now.

It is already making strides in this regard. In May last year, PhonePe stated that it was ready to expand the operational areas of its ONDC app beyond Bengaluru. On 19 December, Google announced at an event in

The ONDC protocol is inherently mobile-first, with its services accessible through popular platforms such as Paytm and PhonePe, among others.

New Delhi that it has partnered with ONDC to onboard metro railway ticket bookings through the Google Maps platform itself. On the very same day, Meta announced at a separate press conference that it is onboarding ONDC to offer e-commerce access for small businesses through WhatsApp.

As services and merchants expand, ONDC stands at the cusp of bringing democratised, open e-commerce to mobile users across the country. With over a billion users projected to be online on mobile phones in India soon, this marks a massive opportunity for ONDC to create a model that could pose a significant challenge to private e-commerce monopolies such as Amazon and even the homegrown Flipkart.

DOES IT CHARGE ANY COMMISSION?

As of now, ONDC does not charge any fee. However, Koshy has said in media interactions before that once the protocol begins to scale, the entity may start charging a “small fee” that remains unspecified as of now. This fee, however, is expected to remain nominal, and would only be to the extent of technical maintenance of the protocol.

ONDC, to be sure, would not hold any data as an intermediary—and would therefore need less operating technology infrastructure expenditure than any other private e-commerce venture.

The big question, however, is that if it takes business away from platforms, why are they interested?

The secret lies in the sheer potential of scale that ONDC can reach out to. If it does scale successfully, ONDC will do away with restrictions of a platform, and make it possible for anyone to order from any platform. While this does take away platform exclusivity, it also brings a platform up to be able to access the user base of a rival platform.

What this does is essentially open up access to over a billion users of mobile phones to practically anyone, which is the true lure of ONDC. Once a user does access a platform, the latter may offer further additional value

purchases—now subject to Dark Patterns regulations in India—to generate additional revenue. User recollection of brands that fare well on the ONDC protocol would also gain from reliable services and reputation.

The key here is the access to pretty much all of India that ONDC can enable, which is what is bringing an increasing number of parties into play. For instance, taking the 19 December announcement into account—for Google, the discoverability of a cab from within the Google Maps interface itself means that users will not need to leave Maps to book cabs. In turn, this increases usage time on Maps itself, and along with that, its monetisation may receive a boost through native ads running on it.

Similarly, WhatsApp is one of Meta’s biggest challenges when it comes to monetising over 400 million monthly active users on it. With such a massive user base, roping in small businesses to onboard through ONDC will give them the impetus to eventually monetise them, thus expanding the ambit of accessibility of a particular service.

HOW DOES IT DEMOCRATISE M-COMMERCE?

It is this open accessibility that does away with the need for a particular service, thereby not needing exclusive platforms that are not open markets, that gives birth to the idea of ONDC democratising mobile-driven e-commerce operations everywhere in the country. Koshy’s target of over a billion monthly transactions via ONDC by 2027 also lends credibility that ONDC’s targets are, in fact, quite achievable.

At the heart of it lies the proliferation of smartphones and mobile data to over a billion users cumulatively, which is expected to open up access to e-commerce for any platform, anywhere in the country. With a decentralised web of service providers reaching users—and vice versa too, ONDC is well poised to become the next large-scale successfully developed DPLs—thus bringing in mobile phone-based e-commerce for all. 🍌

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Cloud for gaming: Buff or nerf?



Adam Smith
Senior Sales Manager – Games,
Amazon Web Services

“

As more and more immersive experiences come in media and entertainment, and linear TV areas, Cloud will become all the more beautiful.

BY PRATIMA HARIGUNANI

Meeting Adam Smith, Senior Sales Manager – Games at Amazon Web Services in one of the many corridors at a huge conference like AWS Re:Invent is like finding an easter egg. It is both fun and surprising to grab a few minutes to chat with him as he gives a preview on how weapons like Cloud, latency, 5G, Silicon and proximity are helping the gaming segment to level up like never before. Will it be GGWP (Good Game, Well Played) for AWS? Let us hunt it out.

What is the significance of the gaming industry for AWS, especially Cloud gaming?

We provide tools enabling game developers, whether

small indie creators or major players, to elevate their games. AWS offers a range of tools and technologies for Cloud gaming developers to create exceptional experiences, bringing solutions and practices to differentiate these entities.

AWS has recently collaborated with Immutable. Anything you can share on that?

Our collaboration with Immutable aims to ensure that all developers have comprehensive infrastructure support, whether they are involved in standard games or Web 3. Immutable helps us fill that part in Web 3 space. Immutable plays a crucial role in the Web 3 space,

AWS offers tools and technologies for Cloud gaming developers to create exceptional experiences, offering solutions to differentiate these entities.

where we will continue to develop the technology that customer asks for. We will continue to bring the best compute, storage and networking out there.

How are gaming enterprises different from traditional enterprises?

Interestingly, in recent years, traditional enterprises have embraced a lot of gaming technology. For instance, Emirates uses it for training, and media and entertainment clients apply it in various business areas. Many cloud-based VFX workloads tap the advantage of low latency and game-engine technology too.

How much is 5G changing this space? Are adjacency, proximity, and availability zones more critical in gaming now, given the need for negligible latency?

Wavelength and Local zones are designed to bring compute capacity to markets around the world. Today, players can connect to anyone with the power of 5G. We bring that experience close to players demanding high levels of connectedness.

Will latency become a competitive differentiator or a staple in gaming as we move into a post-5G world? Any thoughts on India here?

There are games that players play from the East Coast to the West Coast. We can help gaming companies introduce a new region without any issues with servers across either coast. Overall, we are seeing workloads that were set in on-premise environments being moved to the Cloud. Latency can bring near-time responsiveness. It starts in the early part of a game developer's lifecycle. Story-telling is now open to everyone irrespective of geographic boundaries.

Many OTT players are considering a move to gaming. How will the availability or latency angle play out for them?

Well, Riot is doing the opposite and it has been a great

partner. We love working with them and supporting their strategy. Netflix is also one of our customers. We are happy to be a part of what they are building. As more and more immersive experiences come in media and entertainment, and linear TV areas, Cloud will become all the more beautiful. It can allow one player to work with similar resources as another one.

About latency, it is not the only factor that is important. Performance is also important. AWS has been working for the last five years on chips to boost it. This year it was Graviton4, which Epic Games has tested and called the fastest chip ever tested. Graviton is powering a new direction. Game developers can find new ways to surprise and delight with boundary-pushing technologies.

Would custom-silicon give a pivot to the gaming industry which has been so reliant on GPUs so far?

Gaming has been using GPUs in a variety of areas. The performance that we bring with Trainium and Inferentia is a good advantage as it also achieves lower costs. That allows game developers to choose the right instance for their application and gives them a wide choice. We also work with Nvidia on GPU offerings.

Do availability zones affect customer choice?

We have 102 availability zones which is a strong factor in how we approach gaming architecture and space. Our local zones and regions are strong differentiators.

Who are your favourite customers?

Riot, known for its League of Legends has been a long-time customer. It will exit its final data centre as part of a multi-year transition in 2024. Then there is Epic Games and more. All game developers are building experiences with us without having to worry about scaling to millions and billions of players. 🧡

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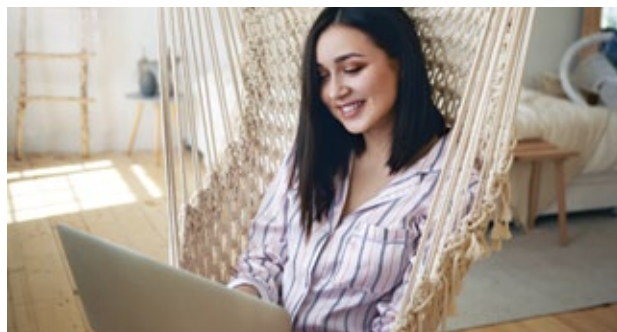
India leads the world in flexible, remote work model

In a global landscape where companies are encouraging a return to the office, ADP's People at Work 2023 report unveils a distinct trend in India, showcasing the growing significance of data, connectivity, and remote infrastructure. The report reveals that 44% of Indian employees are actively engaged in a fully flexible work model, surpassing other APAC countries such as China (16%), Australia (20%), and Singapore (24%).

The study, based on responses from over 32,000 workers across 17 countries, indicates that 74% of surveyed Indian employees reported increased productivity, attributing their success to the acceptance of remote work in office settings. Notably, only 14% of Indians reported working from the office every day, with 41% adopting a hybrid model that includes a certain number of days in the office each week.

The report underscores the flexibility enjoyed by Indian workers, with 43% having organisational approval to work from anywhere globally and 42% having the flexibility to work from anywhere within India. Furthermore, 74% of respondents reported a boost in productivity due to the remote work model.

A significant revelation from the report is that 76% of surveyed women, including 78% of working mothers, feel empowered by flexible working arrangements. This empowerment serves as a key factor in retaining women in the workforce, enabling a balance between professional and personal lives.



Rahul Goyal, Managing Director, ADP India and Southeast Asia emphasised India's standout position in offering the highest workplace flexibility in APAC. Goyal stressed the importance for organisations to adopt a tailored workplace strategy that accommodates the diverse needs of the workforce, fostering a dynamic and progressive work environment.

The report also provides insights into worker expectations for the next 3-5 years. While 35% anticipate continued remote work, 31% foresee a shift to a hybrid model. Additionally, 29% expect closer monitoring of work outcomes, and 39% anticipate full flexibility of hours based on productivity and results metrics. Intriguingly, 25% of workers foresee a reduction in manual tasks due to AI. The findings underscore India's leadership in shaping the future of work through evolving work models and embracing technological advancements.

XgenPlus introduces multi-lingual mail address feature

Data Group's XgenPlus, an email management solutions provider, has introduced a multi-lingual mail address feature that allows users to create email addresses in their preferred language. The initiative focuses on Hindi Mail Address features and emphasises universal acceptance readiness.

The Internationalized Domain Name (IDN) compliance enables DataMail users to use local language characters, going beyond traditional English characters. This development caters to various scripts, including Hindi, Gujarati, Cyrillic, Chinese, and more.

XgenPlus aims to narrow the communication gap between English and non-English-speaking populations by facilitating email communication in native languages. Datamail, with its Multi-lingual Mail Address Feature, aims to garner acceptance across multiple countries,



promoting the use of regional languages. This initiative is a move towards breaking down language barriers and fostering more inclusive and accessible email communication for a broader audience.

Alstom launches digital experience centre for signalling solutions



Mobility solutions provider, Alstom, launched India's first Digital Experience Centre, spanning 5,000 sq. ft. in Bangalore. The hub will serve as a crucial space for executing rail projects and integrating cybersecurity, security, telecom, and SCADA features. The company now has its largest signalling lab infrastructure, spread across 60,000 sq. ft. in India.

The centre will facilitate learning, experimentation, and validation of Alstom's signalling solutions, conducting simulations of world-class technologies. It leverages the Internet of Things, Internet of Behaviours, GenAI applications, and blockchain for railway innovation projects, enhancing business capabilities, and efficiency, fostering a culture of innovation.

With features like centralised demonstration, remote monitoring, safety-critical hardware display, and end-to-end tests, the centre aligns with the 'Make in India' initiative and incorporates emerging technologies like AI, Big Data, intelligent maintenance, LTE, and cybersecurity, further positioning Alstom in sustainable mobility solutions.

Olivier Loison, Managing Director, Alstom India, emphasised the centre's role in driving safety, efficiency, and improved passenger experience in India's modernised and complex rail network. Alstom aims to lead rail technology innovation by harnessing the country's talent pool.

The Digital Experience Centre supports over 7 million hours of engineering work for both Indian and global projects. According to a study by GII, the market for railway signalling systems is expected to grow significantly, and Alstom's infrastructure in India addresses over 40% of its worldwide R&D needs.

Honeywell bags RLS contract for integrated building management



Honeywell Automation India has announced that its Honeywell Building Solutions business has secured a contract from Reliance Life Sciences (RLS) for building management and safety technology. The contract involves supply, installation, testing, and commissioning of integrated building management command and control and environment monitoring systems.

It also includes the integration of current fire detection and voice evacuation systems with Honeywell Connected Life Safety Services (CLSS) for its multiple plants in Nashik. Honeywell's contract with RLS encompasses a seven-year annual maintenance support commitment, providing sustained operational excellence. The seven-year contract includes an annual maintenance support commitment.

Honeywell's Enterprise Buildings Integrator (EBI) Command and Control Suite empowers Reliance Life Sciences with a comprehensive overview of its building management and security systems that is seamlessly consolidated within a unified dashboard. This integration allows Reliance Life Sciences to oversee numerous operations and stations across a 160-acre facility more efficiently.

The CLSS cloud platform integrates data for secure, compliant, and efficient fire system management, offering connectivity, intelligence, and remote monitoring. As part of the project, the company will integrate and deploy its EBI Command Control Suite and CLSS making it a significant win in the pharmaceutical vertical. "The building management and safety technology will enhance the overall safety, efficiency and sustainability across RLS," said Ashish Modi, President, Honeywell India.

RLS has a long-standing relationship with Honeywell in building management technology solutions. Expressing satisfaction about the partnership with Honeywell, RLS President KV Subramaniam highlighted the transition to next-generation connected life-safety services on a larger scale across multiple manufacturing facilities in Nashik.

Airtel Business, IntelliSmart to power 20 million smart meters

Telecom service provider Bharti Airtel has formed a strategic partnership with IntelliSmart Infrastructure to deploy over 20 million smart meters in India. This marks Airtel's foray into smart metering applications such as Head End Systems, Meter Data Management Systems, along with Cloud and analytics. The deal, one of the largest in India's smart metering space, will bolster Airtel's rapidly expanding IoT deployment across various sectors.

Airtel's IoT proposition includes its proprietary platform, the 'Airtel IoT Hub', hosted on Airtel's cloud network. This hub enables advanced analytics, real-time tracking, and monitoring of smart meters while ensuring telco-grade security. Ganesh Lakshminarayanan, CEO of Airtel Business, highlighted that this strategic move positions Airtel as a key player in realising the Indian government's vision of digitising 250 million conventional meters into smart meters.

IntelliSmart Infrastructure's CEO, Anil Rawal, emphasised the importance of Airtel's role as a strategic partner, considering the scale of India's smart metering program and the need for robust infrastructure solutions. The government aims to replace 250 million traditional



meters with smart meters in the next five years, aligning with its Advanced Metering Infrastructure (AMI) initiative.

This partnership builds on Airtel's momentum in the IoT space, with the company already connecting over 20 million devices through its IoT solutions across India. Airtel's IoT services cater to various industries, including automobile, energy, utilities, logistics, financial services, and manufacturing, offering secure and dedicated private networks for data transmission across connected devices. The collaboration underscores Airtel's commitment to driving digitisation and innovation in India's evolving telecommunications landscape.

Wipro helps Marelli to develop cabin digital twin

Technology services and consulting company, Wipro, has assisted Marelli Electronic Systems, a mobility technology supplier, in developing its cabin digital twin. The technology simplifies simulations, validation, and testing processes, eliminating the need for physical cabins and reducing prototyping costs by up to 30%. The virtual cabin replica operates concurrently in the cloud, leading to a 70% reduction in development time. Marelli's solution supports over-the-air software updates, allowing OEMs to quickly address customer demands.

The automotive industry, facing increased software and data complexity, must establish profound software competence in the cloud while maintaining cost efficiencies, reducing deployment time, and enabling frequent updates throughout a vehicle's lifetime.

Leveraging Wipro's Cloud car and extensive Artificial Intelligence and Machine Learning ecosystem, Marelli created a smart, automated cloud-based solution for testing, validating, and updating Software-Defined Vehicle (SDV) features, reducing the time required for new software updates. Wipro's cloud and containerised



microservices enabled the swift implementation of new features, resulting in cost savings and streamlined software updates.

Yves-Antoine Brun, Vice President and Head of Wipro Engineering Edge Europe, expressed excitement about leveraging software engineering expertise to bring a connected, cloud-native solution to the market. Roberto Secchi, Head of Software Platform and DevOps at Marelli Electronic Systems, highlighted the multi-year partnership with Wipro and the role of Wipro's broad SDV talent pool in creating this groundbreaking innovation.

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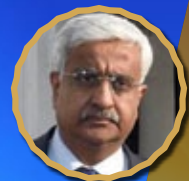
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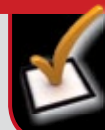
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SHUBHENDU
PARTH
[OPENING NOTE]

The e-commerce dilemma needs an ethical overhaul

We have all heard of stories from customers receiving bricks instead of the goods they ordered online or products not per the specifications mentioned on the e-commerce platform. Often there is a spurt in such incidents during peak seasons and major sales events like Black Friday. British author and filmmaker Oobah Butler, however, took this problem to an unprecedented level by exposing Amazon's harsh working conditions through a daring experiment.

In his documentary, *The Great Amazon Heist*, Butler shed light on the appalling working conditions faced by Amazon delivery drivers, including urinating in bottles to save time. To draw attention to this issue, he collected bottles of urine from these drivers and creatively marketed them as an energy drink called 'Release Energy.'

Soon, the fake product became a bestseller on Amazon in the 'bitter lemon' drink category, emphasising the platform's vulnerability to manipulation. To achieve this Butler got his friends to buy the product and leave positive feedback on the platform.

This experiment not only revealed the deplorable conditions faced by delivery drivers in countries like the US, UK, Italy, and Spain but also exposed the lack of oversight and understanding within powerful e-commerce platforms. The ease with which Butler managed to list a fake product on Amazon, and subsequently push it to the top of the sales charts, underscored the platform's ignorance of its inner workings.

In India, the situation for e-commerce delivery drivers is no better, with numerous reports of accidents occurring as drivers rush to meet tight delivery deadlines. Additionally, many e-commerce platforms lack control over their vendors and the quality of products supplied, raising concerns about customer safety and satisfaction.

To address these pressing issues, the government must take decisive action. Firstly, stringent regulations and oversight mechanisms need to be put in place to ensure that e-commerce platforms adhere to ethical standards. This includes verifying the authenticity of products, penalising vendors engaging in fraudulent activities, and implementing measures to safeguard the welfare of delivery personnel.

Secondly, the government should collaborate with e-commerce companies to establish comprehensive training programs for delivery drivers. These programs should focus on safety protocols, stress management, and effective time management, reducing the risk of accidents caused by rushed deliveries.

Moreover, there should be regular audits and inspections of e-commerce warehouses and facilities to assess the working conditions and ensure compliance with labour laws. E-commerce platforms should be held accountable for the well-being of their employees, fostering a safer and more respectful working environment.

Butler's audacious experiment serves as a wake-up call for the e-commerce industry and the government across the world. By implementing strict regulations, fostering transparency, and prioritising the safety and well-being of workers, governments can create a secure and trustworthy online shopping environment for consumers. With India's online retail sector expected to surge to USD 325 billion by 2030, the government must take immediate action to curb unethical practices, protect consumers, and uphold the integrity of the e-commerce industry.

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The future belongs to Web3, and it is time to back it

Though the Web3 startup sector is facing financial challenges, there is little doubt it is going to deliver economic and technological gains in the long run



BY PARTH CHATURVEDI

Web3 is envisioned to be the next generation of the Internet, built using blockchain technology. After Web1 (read-only), wherein users could just consume information from a source, and Web2 (read and write), wherein users could consume and interact with online information, Web3 (read, write, and own) promises to let users consume, interact and even own their data. Using the principles of blockchain, Web3 is more decentralised and secure than the current Internet, Web2, where centralised platforms dominate online economies. Web3 is an evolution of the Internet and has the potential to impact a wide range of industries beyond finance, including but not limited to governance, healthcare and education.

The world is already witnessing various applications of blockchain technology across the public and private sectors. Noteworthy government-backed projects in India include the West Bengal government's partnership

with Airchains to establish blockchain-based land ownership and caste certificates recorded on-chain in Maharashtra, built by LegitDocs. India's corporate sector has also started recognising the potential of Web3, with industry leader Reliance expressing interest in exploring blockchain platforms in its latest AGM. This is a global phenomenon, with prominent brands like Nike, Reddit and Starbucks increasingly incorporating NFTs into their brand engagement strategies and major financial players like PayPal introducing their stablecoins for payments. The country is at the cusp of blockchain-powered innovations gaining mainstream adoption soon.

There is no denying that India is globally respected for its technological prowess and is recognised as a global hub for innovation. Even in Web3, the demand for Indian engineering talent is immense, and several world-class projects have been incubated by Indian blockchain developers. However, as India's Web3 ecosystem

Corporate India has started recognising the potential of Web3, with Reliance expressing interest in exploring blockchain platforms in its latest AGM.

continues its rapid evolution, it finds itself at a crucial juncture in its development.

The Web3 startup industry, which was flourishing till the onset of the ongoing bear phase, currently faces multiple challenges spanning from a notable decline in funding, to a lack of clarity regarding a regulatory framework.

WEB3 FUNDING IN INDIA

The funding activity for Web3 startups in India has seen a sharp decline, in stark contrast to the bull market years. Even in 2022, the total Indian Web3 funding was an impressive USD 717.5 million, but halfway through 2023, the YTD total funding has dwindled to a mere USD 104.5 million. This has exposed the need for India to have capital earmarked for the Web3 ecosystem, from dedicated investors who have built an investment thesis for the sector and are in it for the long run.

However, it is worth highlighting that this trend is not unique to Web3 or India alone. It mirrors the global slowdown in funding across startups, as risk capital is being less actively deployed in an increasing interest rate regime. Web3 startup funding also gets impacted by price cycles and usually goes through periods of euphoria and despair.

But in the current downturn, most of what seems to have exited is 'tourist capital', i.e., funding from investors who entered the market out of FOMO during the bull run and could not handle the current market downturn. Web3 native funds based on a long-term thesis, are still actively deploying but with increased scrutiny. To survive the current bear market founders must exercise financial prudence by reducing burn rates and extending their financial runways. They should also explore applying for accelerators and incubators, or building during hackathons to gain more visibility from investors. This period presents a unique opportunity to construct resilient products capable of withstanding the cyclical nature of the market, thus shaping the future of India's Web3 ecosystem.

FUELING THE DIGITAL INDIA NARRATIVE

With the third largest global blockchain developer base of over 10,000 developers, a supportive Web3 ecosystem with a progressive regulatory framework can easily

position India as a global player in the rapidly evolving digital landscape. This could be an Indian IT moment all over again, as we can build a new version of the Internet, that is more inclusive, decentralised and captures more value for end-users.

This focus on strengthening the Web3 ecosystem can, in turn, catalyse economic growth by adding billions of dollars to India's GDP. A thriving Web3 ecosystem is a magnet for investments, both domestic and foreign, resulting in an increasing number of 'crypto' unicorns that will propel the sector forward. This economic prosperity extends beyond the tech sector, benefiting various other industries and amplifying the impact of India's digital evolution. As foreign investments and collaborations flow into the thriving Web3 ecosystem, India not only benefits from capital infusion but also gains access to global expertise and best practices, elevating its overall competitiveness in the digital sector.

Beyond economic gains, the technologies underpinning Web3, such as blockchain and decentralised applications, have the potential to revolutionise critical sectors like governance, healthcare and supply chain management. Blockchains digitise trust and remove the need for middlemen, increasing efficiencies and decreasing attack vectors for any flow of goods, services, information or value. So we have only begun scratching the surface in terms of understanding what business models are possible with Web3 and will continue to be amazed by the value capture that the 'new' Internet will offer.

Crucially, supporting homegrown Web3 companies also safeguards digital sovereignty. It reduces dependency on foreign tech giants, ensuring control over data security and privacy, a pivotal aspect in today's digital age.

In this environment of innovation and research, Web3 companies foster a culture of continuous advancement. It is a decisive step towards realising the vision of a digitally empowered India, seamlessly connecting various aspects of national development and global leadership. 🌐

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Data matters, so does intelligence

By embracing intelligent automation, organisations can reduce errors, and enhance innovation, effectively addressing the new realities of data



BY MANISH GUPTA

Automation is a hot topic these days. Most of us agree that automating business processes can save time and money, making our organisations more efficient and innovative. But there is often an unspoken fear surrounding it. Questions like ‘How much time and effort will it cost to get my organisation up to speed with automation?’ or the elephant in the data centre, ‘Will automation leave my staff without a job?’ contribute to inaction or the late adoption of automation.

IT managers today face multiple challenges in an increasingly competitive environment. According to the Dell Technologies 2023 Innovation Index report, 35% of Indian businesses are dealing with the lack of automation to manage complex security technology. Many of these businesses also share common frustrations that slow

down processes, increase costs, and make life harder and less efficient than it should be.

Especially for medium businesses, lacking the extensive resources and specialist skills of large corporations, are vulnerable to facing risks. On average, medium-sized businesses have limited IT staff personnel, and with a lean team, time is precious. It is estimated that 47% of all cyberattacks target medium businesses, with extremely costly consequences ranging from lost productivity to business success. As the challenges of data protection continue to mount, the pressure for IT teams to reduce cost and to “do more with less” continues to grow.

INTELLIGENT AUTOMATION APPROACH

To accelerate innovation, an intelligent automation

Proactive resilience automatically ensures data and network security with multiple layers of defence while eliminating blind spots before they can be exploited.

IN BRIEF

- **Fears:** Concerns about job loss and implementation costs hinder widespread adoption of automation in businesses.
- **Challenges:** IT managers in medium-sized businesses, face resource limitations and cybersecurity risks, with 47% of cyberattacks targeting such businesses.
- **Complexities:** Automation and intelligence help businesses tackle data complexities, enabling them to leverage valuable insights.
- **Benefits:** An intelligent automation approach, using AI and predictive analytics, offloads management tasks, enhancing efficiency and reducing human errors.
- **Support:** Intelligent automation empowers IT departments, enabling them to focus on high-value innovation initiatives and respond affirmatively to innovation-related requests.
- **Leverage new technologies:** Intelligent infrastructure adapts to any workload to provide flexibility while helping IT simplify operations.
- **Reduce the IT burden:** A modernised infrastructure allows IT staff to spend less time on day-to-day activities and more time delivering business value. Intelligent systems can work together and independently, enabling rapid digital transformation and productivity while allowing organisations to scale without disruption.
- **Deliver “as-a-service” simplicity:** Infrastructure delivered using as-a-service operating models frees IT teams from having to deploy and manage hardware while improving the organisation's ability to acquire, scale, and manage infrastructure as the business grows.
- **Achieve proactive resilience:** About 35% of Indian businesses are still dealing with the lack of automation to manage complex security technology. Proactive resilience automatically ensures data and network security with multiple layers of defence that work in tandem to keep hackers out while anticipating and eliminating blind spots before they can be exploited.
- **Upgrade business agility:** By proactively replacing outdated resources at the optimised time, IT can better maximise the value it delivers for a business and its customers – while reducing costs.

approach uses machine learning, artificial intelligence, and predictive data analytics to offload the management burden and free teams to focus on high-value innovation initiatives.

To enable intelligent automation, organisations must incorporate infrastructure that is built with automation at the core. By automating with embedded intelligence, a business dramatically increases efficiency, reduces human error and improves productivity.

By leveraging automation and intelligence in the organisational value chain organisations can easily address the new reality of data while reducing the impact that complexity has on the business.

In today's rapidly evolving digital economy, organisations must modernise and automate their IT infrastructure to leverage vast amounts of valuable data and draw relevant insights. An intelligent automation approach gives the IT department the ability to say “yes” more frequently to innovation-related requests. 🧩

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Fostering a secure global ecosystem

A shared regulatory framework is vital to ensure a robust digital landscape and a secure interconnected Digital Public Infrastructure



BY NSN MURTY & YUKTI SHARMA

In an increasingly interconnected world, the digital landscape has become a critical component of public infrastructure. Governments rely on digital systems for essential services, economic stability, and national security. However, as our reliance on digital technologies grows, so does the vulnerability of these systems to cyber threats. The Group of Twenty (G20) nations, a forum of the world's major economies, has recognised the imperative for collaborative cybersecurity efforts to secure digital public infrastructure.

Digital infrastructure includes physical and digital assets, and with the proliferation of technology, these systems now encompass everything from power grids to government operations and healthcare databases. Security of these interconnected systems is paramount in the digital age, as a breach can have cascading effects across multiple sectors.

Cyber-attacks on Digital Public Infrastructure (DPI) assets, including data, cloud services, and devices, can disrupt essential services, compromise sensitive data, and

undermine national security. For example, a cyberattack on a power grid could result in widespread outages, affecting everything from homes to hospitals while attacks on financial institutions could lead to economic instability. To safeguard these critical components, a shared regulatory framework is essential, ensuring a robust digital landscape.

Cross-border transactions, from online shopping to international real estate investments, already exist and are integral to the global economy. Recognising their importance, the G20 has established a framework focused on payment system interoperability, regulatory frameworks, and cross-border data exchange and message standards, enabling secure and efficient information sharing.

COLLABORATIVE APPROACH

The G20 is implementing a collaborative approach to global cyber-security by combining resources, knowledge, and expertise among member nations, ensuring a more effective response to evolving threats.

IN BRIEF

- There is an urgent need for collaborative cybersecurity efforts to safeguard DPI, crucial for essential services and national security.
- Cyber-attacks on DPI assets can disrupt essential services, compromise sensitive data, and destabilize economies.
- G20 nations have adopted a collaborative strategy by combining resources, knowledge, and expertise to create a resilient digital infrastructure.
- Balancing national sovereignty with international collaboration, diverse cybersecurity capabilities, and evolving cyber threats pose challenges.
- Continuous adaptation is required to keep pace with new tactics and technologies employed by malicious actors.
- A cybersecurity framework, collaborative trade groups, audits, certifications, and adoption of global standards are key to secure cross-border transactions.

It will also strengthen the resilience of digital public infrastructure by creating a supportive network, making it harder for cybercriminals to penetrate critical systems. These initiatives can contribute significantly to global stability, as a secure digital infrastructure is a fundamental foundation for stability in today's interconnected world.

However, this joint approach to cybersecurity within the G20 also has its set of challenges such as balancing national sovereignty with the imperative of international collaboration, especially concerning sensitive information sharing and adopting global norms. Additionally, the diverse levels of cybersecurity capabilities and different stages of data privacy and security regulations among member nations pose a challenge, requiring efforts to ensure equitable participation and support, especially for countries needing more assistance.

Furthermore, the ever-evolving nature of cyber threats demands continuous adaptation from member nations, who must keep pace with the new tactics, techniques, emerging technologies, and procedures employed by malicious actors. Lastly, any international agreements on cyber norms and standards must navigate complex legal and ethical considerations,

safeguarding individual rights and privacy while promoting global cybersecurity efforts.

CROSS-BORDER INFRASTRUCTURE

A comprehensive approach to enhance cybersecurity and facilitate cross-border trading and knowledge sharing within the G20 framework is now needed. Firstly, the establishment of a G20 regulatory framework on cybersecurity will set universal standards, allowing countries to subscribe to and adopt these guidelines for a globally cohesive approach. In parallel, a shared collaborative trade consortium that collectively defines data policies and guidelines may be established focussed on facilitating cross-border partnerships and supporting businesses

While the guidelines are established, it's crucial to emphasise the need for regular audits, particularly through third-party assessments. The process can be further strengthened by introducing verifiable certification mechanisms for countries that comply with shared standards and regulations. The technology landscape is constantly changing, and with emerging technologies on the horizon, there would be a need to adapt and continuously monitor the maturity of the guidelines. Simultaneously, implementing a shared incident reporting mechanism will bolster collective security awareness, ensuring rapid responses to potential threats.

Additionally, collaborative efforts to adopt and implement global standards, for instance, ISO 20022 for cross-border payments, and ISO/IEC 27017:2015 for the provision and use of cloud services, etc. are of paramount importance. By streamlining communication protocols and data exchange mechanisms, efficiency and security can be significantly enhanced.

With this, the G20 can establish a robust framework for secure cross-border transactions, promoting global collaboration and standardization for a seamless digital trading environment. The core of Digital Public Infrastructure is the well-being of citizens and data integrity, with the primary goal of fostering a trusted ecosystem for secure digital trade with other economies, ensuring non-negotiable safeguarding of personal information. 🌐

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The great Indian AI push

MeitY has come up with a multi-year plan to develop an India dataset platform and build indigenous compute infrastructure



BY VERNIKA AWAL

The Ministry of Electronics and Information Technology (MeitY)'s push for the creation of dedicated data platforms seeks to shape the future of Artificial Intelligence (AI) in India. This, going forward, can help create a centre-backed data platform, with data from Indic languages, to progress innovation that will drive the next generation of corporate data infrastructure in the coming years.

WHAT IS THE MINISTRY BACKING?

On 13 October 2023, Rajeev Chandrasekhar, the Union Minister of State for Electronics and Information Technology, in an interaction with the media, elaborated on the Centre's India AI strategy, which was based on reports compiled from seven working committee reports. There are two clear prongs to the strategy—first, a multi-year roadmap to develop an India Datasets platform, and second, the development of an India AI compute platform to indigenously build chips that will power super complex and powerful data operations.

"The India Datasets platform will be one of the largest and most diverse collections of anonymised datasets

to train multi-parameter AI models... It will be deployed in real-life use cases that span across agriculture, healthcare, education, fintech, cyber security, governance through digital public infrastructure, and languages through the Bhashini program. We believe AI can have a transformational effect in these areas, and catalyse the startup ecosystem that is already fuelling Digital India," Chandrasekhar said at the press briefing.

Chandrasekhar also said that a key part of India's AI strategy will be to create curated datasets as part of the broader platform, which will be managed by an independent National Data Management Office (NDMO) within MeitY. Further, there will be both government as well as private sector datasets within this platform, and only anonymised and non-personal information will be a part of it.

FUTURE OF INDIA'S DATA OPERATIONS

Such a platform is likely to play a crucial role in the future of India's academia, private sector and public sector data operations. In turn, data centres will begin playing increasingly crucial roles in storing, securing and



“The India datasets platform will be one of the largest and most diverse collections of anonymised datasets to train multi-parameter AI models.”

Rajeev Chandrasekhar

Union Minister of State for Electronics and IT, Government of India

processing with low latency the extent of indigenous data in India—all of which can potentially become equitable as a digital public good for a wide range of use cases.

Why, though, is this important? First, most of the world's datasets are based in the English language—which represents the only universal language that offers organised data across various industries such as economy, finance, medicine, energy, and others. In due course of time, each industry will feature multiple business intelligence platforms, which will process anonymised corporate data with trillions of parameters to process industry-wise data analytics.

These data analytics operations, in turn, will play increasingly important roles in every sector—including corporate decision-making, automation of sales and ancillary operations, and internal automation of various sub-segments. To do so, the creation of datasets, especially in diverse language subsets, will be key.

The backing of the government to create a public datasets platform, in this regard, could be key to offering a uniform base for corporations in the country to leverage a public data platform in future. This, in turn, could be particularly key for academic institutions to pursue AI research in applied and theoretical divisions. Startups and small enterprises can also leverage such platforms to create the base for AI operations, even without having substantial revenue for investment.

IN BRIEF

- **Government's vision:** MeitY's initiative aims to shape India's AI future, creating diverse datasets and powerful compute platforms to fuel innovation across sectors.
- **Diverse dataset:** The India Datasets platform will curate anonymised data, spanning agriculture, healthcare, fintech, and more, fostering AI-driven transformation.
- **Data management:** An independent office will manage curated datasets, ensuring a blend of government and private sector data while prioritising anonymity and non-personal information.
- **Digital public good:** The initiative addresses the challenge of English-centric datasets by creating diverse language subsets.
- **Compute power:** By establishing indigenous public compute infrastructure, the government aims to enable resource-limited entities to develop advanced AI applications.

PUBLIC COMPUTE INFRASTRUCTURE

One of the biggest challenges to developing and processing AI models and infrastructure is access to compute power. Today, US tech firm Nvidia has a lengthy waitlist for corporates to get access to their graphics processing unit (GPU) chips—which require multiple billions of dollars to put together and build.

Under such circumstances, having an indigenous public compute infrastructure, akin to India's supercomputer infrastructure, can help companies and entities with limited resources have the ability to create advanced AI applications.

It is this that can help India leverage AI datasets and compute infrastructure as a corporate public good—enabling development at unprecedented levels. Going forward, this can help resolve one of the biggest challenges of AI development—how expensive compute resources have been. In turn, this can be further built upon by private firms, and in turn, be developed into an industry the way the domestic fintech sector was built by the advent of Unified Payments Infrastructure (UPI). 🙌

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TV RAMACHANDRAN

FTTH + WI-FI = SOLUTION FOR INDIA'S DIGITAL ECONOMY

India must explore FTTx and modern Wi-Fi solutions to address 5G monetisation challenges and create an inclusive, sustainable, digital society



In the rapidly evolving digital landscape, India strives to lead the global digital revolution by making significant progress in high-speed Internet connectivity. India has made commendable strides in deploying cutting-edge 5G mobile technology, covering approximately 10,000 towns and deploying 3.4 lakh stations by August 2023. Despite this achievement, the lack of 'killer' use cases poses significant monetisation challenges globally and in India.

Since a base station could have three or more cells, one could do a marketing stroke by stating that over a million cells have been set up. While this is indeed admirable, one must pause and note that it is also an open secret, globally and in India, that there are huge monetisation challenges in 5G due to a lack of 'killer' use cases.

NEED FOR A BALANCED DIGITAL ECONOMY

India can ill afford to waste its financial resources on projects with nil or negative returns and hence, alternative technological solutions need to be considered for digital progress. It needs to also be appreciated that a good digital economy needs to be a balanced one by technology.

A lopsided economy, with over-dependence on fixed broadband, mobile broadband, or any other technology, would not be adequately efficient or sustainable for the modern era. There needs to be balanced and holistic

development of all elements of digital infrastructure including fixed networks, mobile, satellite, Wi-Fi, data centres, CDNs, etc. to ensure optimum results.

As is well known, mobile technology is subject to the characteristics of RF engineering. The speed delivered, the reliability, and the consistency are dependent on multiple variables like distance from the tower, foliage and/or thickness of walls between handset and tower, number of subscribers logging onto the tower at that time, as well as the speed of movement of the subscriber.

These factors are outside the control of the operator or the subscriber and hence result in quite variable and unpredictable quality. However, both fibre and Wi-Fi are less subject to variables and hence the combo of Fibre-to-the-home/ building (FTTH/B) and Wi-Fi can provide far more reliable and consistent quality.

ADVANTAGES OF FTTX AND WI-FI INTEGRATION

Implementing 5G infrastructure requires significant investment in expensive towers, network equipment and electronics. In contrast, FTTx can leverage existing infrastructure like utility poles, power lines and underground ducts, which can significantly reduce deployment costs. This makes FTTx a more cost-effective solution for a country like India with budget constraints and a price-sensitive market.

“Fibre can have nearly infinite capacity and by optical characteristics, can deliver much higher speeds than even 5G.”

A lopsided economy, with over-dependence on fixed broadband and mobile broadband, would not be efficient or sustainable for the modern era.

Fibre can have nearly infinite capacity and by optical characteristics, can deliver much higher speeds than even 5G. When seamlessly integrated with Wi-Fi technology, these speeds transcend barriers, offering users an unparalleled online experience. This high-speed connectivity becomes the catalyst for various technological marvels, from seamless video conferencing and real-time data analytics to immersive virtual reality experiences.

Also, noteworthy is the situation as regards China, where at the end of August 2022, there were 622 million fixed-line broadband users, up 32.1 million from the start of the year as against mobile broadband users of about 1 billion by December 2022. Recent data reveals that 22% of broadband customers in China have access to downlink speeds of at least 1 Gbps. Media reports indicate that out of the total broadband users in China, 94% have a connectivity of 100 Mbps and above. However, even in China, 5G has not generated economic returns for the operators.

On the other hand, India, as of July 2023, clocked 832.5 million wireless broadband subscribers and 35.7 million wired broadband subscribers. This is a highly unbalanced digital situation and quite undesirable for achieving a healthy growth of Digital India. No wonder then, the country needs to step up fast to match and excel in the uptake of FTTH/B in comparable regimes. The Estimated additional FTTH/B connections during the January-March 2023 period stands at 1.36 million for Brazil, 14.6 million for China, and 1.75 million for the USA. In contrast, India stands at just 0.81 million.

EMBRACING MODERN WI-FI TECHNOLOGIES

An FTTH/B connection with a good wireless router at the endpoint makes for a compelling broadband connection and is particularly relevant for India. As earlier pointed out, this type of connection provides very good speed, and bandwidth as well as reliability and consistency in the home or building. Unfortunately, since the start of mobile communication in India, Wi-Fi did not get the importance it deserved and hence this segment languished completely until NDCP 2018 brought it to the fore and

stipulated a goal of 10 million public Wi-Fi hotspots by December 2022. However, the achievement against this target has not been more than about 0.5 million.

It is noteworthy that the Bharat 6G Vision Document released by the Prime Minister of India in March 2023 emphatically restated an augmented goal of 50 million public Wi-Fi hotspots by 2030. Both NDCP and the 6G Vision Document thus clearly underscore the need for adequate public Wi-Fi backup to support the advanced technologies of 5G and 6G. India now needs to install at least seven million public Wi-Fi hotspots every year to meet the 6G Vision by 2030.

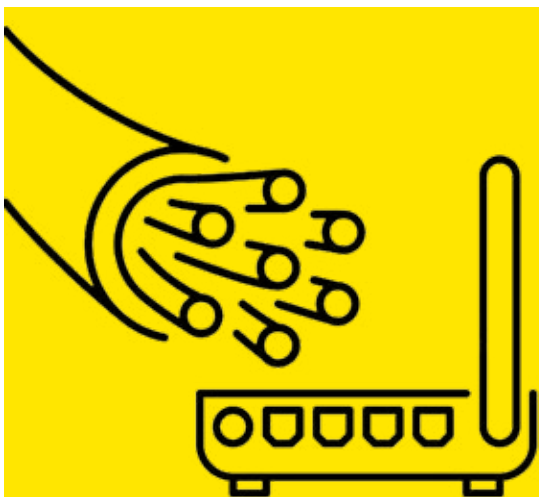
It should be noted that India needs to also ensure the use of the modern and advanced Wi-Fi technologies that are available. The country is, predominantly, still on Wi-Fi 5 (802.11ac) whereas the world has moved on to the advanced versions of Wi-Fi 6 and Wi-Fi 6E, and is on the verge of adopting Wi-Fi 7. Wi-Fi 6E is a powerful version of Wi-Fi 6 (802.11ax) offering several advantages, including wider channels of 160 MHz or even 320 MHz and lower latency making it ideal for applications like 4K and 8K streaming, sophisticated online gaming and other bandwidth-intensive tasks.

Many new devices and routers are now equipped with Wi-Fi 6E support to take advantage of these benefits. India can ill-afford to lag in this respect. Further, HCL in India has already developed Wi-Fi 7 chips and is exporting them whereas the country is yet to adopt them. With such modern Wi-Fi versions on top of an FTTH/B connection, the possibilities are limitless.

FTTX AND WI-FI IN RURAL CONNECTIVITY

The recent approval of Rs.1.39 lakh crores for BharatNet presents an opportunity to extend FTTx and modern Wi-Fi connections to every village. This is probably the largest funding globally for reaching broadband connectivity to rural areas. This can prove to be an excellent method of taking FTTx + modern Wi-Fi like Wi-Fi 6E to reach rural citizens, enhancing healthcare, education, and work opportunities, thereby bridging the digital divide and creating a more inclusive society.

An FTTH/B connection with a good wireless router at the endpoint makes for a compelling broadband connection that is relevant for India.



IN BRIEF

- **Monetisation challenges in 5G:** Despite 5G deployment, the lack of 'killer' use cases globally and in India poses significant monetisation challenges.
- **Balanced digital economy:** India needs a balanced digital economy, avoiding over-dependence on specific technologies for sustainability and efficiency.
- **FTTx and Wi-Fi:** FTTx leveraging existing infrastructure and high-speed Wi-Fi integration offer cost-effective, reliable, and scalable solutions.
- **Evolving Wi-Fi Tech:** India must adopt Wi-Fi 6E and Wi-Fi 7 for seamless connectivity and to keep pace with global standards.
- **Rural connectivity:** Investment in BharatNet offers an opportunity to extend FTTx and modern Wi-Fi connections.
- **Environmental sustainability:** FTTx and Wi-Fi contribute to environmental sustainability by consuming less energy as compared to other technologies.

Fibre-enabled Wi-Fi networks can play a big role in smart cities and smart villages. From intelligent traffic management and energy-efficient infrastructure to connected public services, the synergy between fibre optics and modern Wi-Fi can remarkably transform urban, semi-urban and rural living. Additionally, FTTx + Wi-Fi is also vital for the expeditious growth of IoT, which is essential for India.

Unlike other competing technologies which consume significant amounts of energy and give rise to environmental concerns, FTTx + Wi-Fi also contributes to environmental sustainability since fibre optics require less energy to transmit data over long distances. WIK Consult has shown that FTTx networks are 2.5x times more energy efficient per megabyte transmitted than 5G. A 15% transfer of traffic from fixed to mobile networks could result in 16% higher energy consumption which would lead to 3.2 megatons of additional CO2 emissions in Europe per year by 2030.

It is undeniable that 5G technology has tremendous advantages in many 'mobile' applications but a vast and diverse country like India demands other complementary approaches as well. FTTx + Wi-Fi presents a compelling alternative that can effectively address the nation's unique challenges. Fibre and Wi-Fi combo offers a cost-effective, reliable and scalable solution to bridge the digital divide and provide high-speed Internet to nooks and corners of India. There is also the unique opportunity of deploying the innovation of PM WANI public Wi-Fi architecture which enables hassle-free movement from one public Wi-Fi hotspot to another for accessing broadband without repeated KYC authentication, verification etc.

Leveraging the landmark Cabinet decision, we now have an opportunity to take a giant stride towards a more inclusive society. Indeed, in the race for digital transformation, FTTx plus modern Wi-Fi might well prove to be India's winning combination. 🌐

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Aprecomm to power Mercku WiFi mesh devices



Aprecomm has announced that Mercku will be adopting the company's AI-enabled analytics platform to power its innovative WiFi mesh devices. Mercku equipment will now have out-of-the-box support for Aprecomm's network intelligence cloud, which helps optimise connectivity experience for homes and small businesses. Communication service providers using Mercku's WiFi devices can benefit from complete network visibility, enabling them to swiftly resolve customer inquiries through fully automated root-cause analysis, reducing response times to mere minutes.

Aprecomm provides an Artificial Intelligence (AI) enabled software stack to measure WiFi Experience for broadband and enterprise users. Its patented WiFi intelligence solutions proactively identify and troubleshoot WiFi issues, improving subscriber quality experience. This helps ISPs and enterprises improve support efficiency, reduce downtime, and reduce operating costs. It currently manages more than five million WiFi equipment and has proven positive ROI for communication service providers across the world.

Pramod Gummaraj, CEO, Aprecomm, expressed his excitement about the partnership, stating that it will transform WiFi experience management for ISPs in Mercku's markets, boosting broadband rollout efficiency and ensuring unparalleled success. Mercku's Co-Founder and CEO, Shi Ge, emphasised the merger of art and technology, providing users and operators with solutions they love.

Guharajan Sivakumar, CTO of Aprecomm, highlighted how their AI-based solution will elevate WiFi performance, offering Mercku users a flawless Internet experience and empowering service providers with cutting-edge subscriber understanding technology. This collaboration marks a significant step forward in the evolution of WiFi connectivity, promising seamless experiences and efficient support for users and providers alike.

Safexpay launches neobanking platform for MSMEs



Safexpay, the digital payments company, has unveiled NeuX, a cutting-edge neobanking platform tailored for Micro, Small, and Medium Enterprises (MSMEs), corporates, and B2B businesses. NeuX seeks to revolutionise the B2B payment and workflow landscape by digitising entire business operations. Targeting 50-70 million merchants in key sectors, Safexpay aims to provide a comprehensive B2B digital solution.

The platform addresses challenges in the B2B payment sector, such as managing complex ERP systems, high integration costs, and outdated payment methods. NeuX is a holistic B2B platform, enabling seamless payments and offering value-added services on existing payout platforms. It promises to simplify business operations, including purchase and sales management, inventory control, and taxation, ushering in a new era of digital business.

NeuX caters to diverse sectors, including FMCG, pharma, agriculture, and e-commerce, accommodating businesses with or without supply chain modules. Unlike conventional neobanking services, NeuX goes beyond payments, guiding businesses through workflow.

While initially designed for Indian markets, NeuX is poised to serve MSMEs in the Gulf region, including Saudi Arabia, UAE, Oman, and Qatar. Safexpay's recent venture into the GCC region demonstrates its commitment, with plans to invest USD 8-10 million and an anticipated annual growth rate of 80-100% by 2025. NeuX signifies a significant leap towards digitisation, empowering businesses with seamless, secure, and efficient solutions in an ever-evolving digital landscape.

STL develops the world's slimmest 160-micron OFC

Indian optical and digital solutions company STL has unveiled the world's slimmest 160-micron Optical Fibre Cable (OFC). Engineered at STL's Centre of Excellence in Maharashtra, this indigenously developed technology enables the 160-micron fibre to carry 3 times more capacity than traditional 250-micron fibres. By significantly reducing the cable diameter to 6.4mm, approximately 32% less than the 250-micron fibre, STL's innovation will transform deployment, bandwidth capacity, and environmental impact of networks.

This breakthrough has significant implications for India's broadband landscape, especially in large-scale projects like Bharatnet, where deploying around 20 million fibre km cables by 2025 is a monumental task. The use of 160-micron fibre in place of the standard 250-micron fibre could potentially reduce deployment time by 15%. Moreover, this technology allows the use of smaller diameter ducts, thereby decreasing the plastic footprint in the ground by approximately 30%.

STL's 160-micron fibre meets stringent telecom-grade optical performance standards and complies with the ITU G.657A2 standard. The reduction in fibre size below



250-micron, a challenging feat, has captivated optical experts worldwide. The innovation marks a significant leap in the global optical technology landscape, showcasing India's prowess in the field.

Dr Badri Gomatam, Group CTO at STL, emphasised their achievement in overcoming challenges related to micro-bending sensitivity and complexity in the fibre drawing process, stating, "Through highly calibrated process and material engineering, we have achieved a breakthrough in manufacturing processes and glass compositions to realise micro bend insensitivity."

HFCL launches 1728 fibre IBR cable

Integrated communications product and solution provider, HFCL Limited, has unveiled a cutting-edge product in the form of its 1728-fibre Intermittently Bonded Ribbon (IBR) Cable. This new cable empowers telecom operators and enterprises to expedite the installation of 5G network infrastructure, enhance Fiber-to-the-Home capabilities, and meet the escalating demand for high-capacity networks, particularly from data centres.

HFCL's 1728-fibre IBR cable offers twice the fibre packing density within the same diameter compared to traditional 864-fibre flat ribbon cables. The gel-free IBR cable is designed for high-productivity mass fusion splicing, ensuring cost-efficient deployment, easy installation in congested areas, and swift restoration in case of accidental outages.

As businesses migrate to the cloud and sectors like BFSI, e-commerce, manufacturing, and retail drive demand, India's data centre market is set to boom, with 45 new data centres, covering 13 million sq. ft, expected to be established by the end of 2025. These high-fibre count IBR cables play a crucial role in meeting the demand for dense fibre connectivity, essential for managing larger, sophisticated data centres.



Additionally, the Indian government's focus on fibreisation and significant investments in telecom infrastructure across global markets provide a substantial opportunity for companies like HFCL. Despite the progress with a 38.44% fibre penetration rate, India aims to achieve 70% tower fibreisation by 2024-25, as per the target set by the government. The recent approval of a Rs 1.39 lakh crore plan for rural broadband connectivity further amplifies the demand for fibreisation to bridge the digital divide.

Scytale unveils first quantum secure communication platform



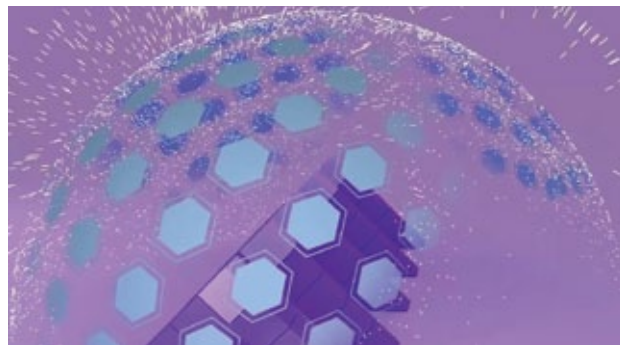
Delhi-based Quantum Security Company, Scytale Alpha, incubated by the Data Security Council of India (DSCI), has introduced India's first Quantum Secure Communication Platform, setting a new standard in secure messaging and video conferencing. Designed to fortify India's communication backbone amidst global uncertainties, the platform ensures unparalleled privacy, security, and data ownership.

Scytale Alpha's innovative solution offers on-premises security, ensuring user data never leaves a secure space, and granting absolute control over governance, law enforcement, strategic operations, and diplomatic exchanges. By incorporating advanced post-quantum cryptographic key exchange and a Quantum Random Number Generator (QRNG), the platform facilitates secure mutual handshakes between clients, making prediction and hacking virtually impossible.

Wing Commander Satyam Kushwaha (retd), Director of Scytale Alpha, emphasised the platform's significance in safeguarding India's sovereignty, addressing vulnerabilities posed by existing platforms with servers located outside India's jurisdiction. This pioneering solution protects formal and informal communications, mitigating risks to national interests.

Furthermore, the launch of the national quantum mission presents a significant opportunity for India to advance in quantum computing and related technologies. The mission's potential impacts across sectors like healthcare, sustainability, clean energy, climate change, and employment underscore its profound significance for all Indian citizens. Scytale Alpha's Quantum Secure Communication Platform marks a crucial step towards India's digital future, ensuring robust and sovereign communication channels in an increasingly complex global landscape.

NetApp, Equinix deliver BmaaS for Cloud adjacent experience



NetApp has partnered with Equinix to introduce a new Bare-Metal-as-a-Service (BMaaS) solution. The new offering integrates NetApp Storage with Equinix Metal to operate as an as-a-service model through NetApp Keystone. NetApp Storage on Equinix Metal offers a comprehensive hybrid cloud experience within a single subscription, enabling users to customise storage capacity and performance without unnecessary overprovisioning. It also integrates seamlessly with Equinix Metal's infrastructure, providing a unified full-stack experience for storage (file, block, and object), compute, and networking under one subscription.

Key advantages of this solution include cloud-adjacent capabilities, allowing users to build their hybrid multicloud experience while retaining control over their data in a low-latency, high-performance environment. The integration of NetApp Storage with Equinix Metal's dedicated bare metal servers ensures fast data access, minimal latency, and efficient handling of demanding workloads.

Users can scale storage resources on demand to meet evolving business needs, benefiting from NetApp Storage's robust data security features, including industry-leading encryption and ransomware protection. Equinix's global network enables the deployment of NetApp Storage on Equinix Metal in Equinix International Business Exchange data centres worldwide, offering simplified management through NetApp's unified control plane and Equinix Metal's automated provisioning platform.

This strategic collaboration expands NetApp's cloud strategy, delivering a hybrid multicloud experience. The solution optimally connects to major public clouds through local, high-speed connectivity, offering users full access to NetApp cloud services such as Cloud Volumes ONTAP on Equinix's global dedicated bare metal equipment. With this cutting-edge offering, NetApp and Equinix redefine the possibilities of hybrid cloud solutions, ensuring flexibility, scalability, and security for businesses globally.

Airtel offers omnichannel platform for CCaaS



Bharti Airtel has introduced a Contact Center as a Service or Airtel CCaaS, an integrated omnichannel cloud platform that merges Voice-as-a-Service (VaaS) and cloud connectivity, eliminating the need for enterprises to source voice, cloud, and software separately from various vendors. This approach significantly reduces capital and time investments for contact centre requirements.

The platform, in collaboration with leading providers like Genesys, offers a unified experience by combining the best of voice, cloud, and contact centre software. The platform enables enterprises to initiate contact centre solutions instantly at affordable monthly costs, simplifying management and enhancing customer contact experiences. Abhishek Biswal, Head of Digital Products and Services at Airtel Business, expressed confidence in revolutionising the segment, streamlining operations, and enriching customer interactions.

Airtel CCaaS enables seamless call handling for inbound and outbound calls, call routing, queuing, conference calling, redirection, and cloud monitoring accessible from any office location at any time. The platform also eliminates the need for enterprises to close requisite regulatory compliances and the challenge of longer wait time during troubleshooting requirements, which not only involve higher capital, operational expenses and time investments but also limit easy scaling to other locations.

Offered under Airtel's CPaaS platform, Airtel IQ, CCaaS underwent successful pilot testing with positive feedback from marquee customers, highlighting its convenience and affordable pricing options. This groundbreaking technology promises to reshape the contact centre landscape, providing businesses with an efficient and cost-effective solution for their communication needs.

Nokia to help Tata Play launch WiFi 6 services



Nokia has announced that Tata Play Fiber will deploy its fibre optical line terminal (OLT) technology across its network footprint in India. The OLT will enable Tata Play Fiber to offer WiFi 6 services, increase data capacity and improve seamless coverage to residential and SOHO enterprise customers.

Nokia will supply fibre-to-the-home and Wi-Fi equipment, including OLT, Optical Network Terminal, and Wi-Fi 6 mesh Beacons. A key feature of the Nokia solution is its Mesh technology which will ensure seamless coverage for large customer premises and areas with barriers like concrete walls, and the use of AI/ML software to identify traffic patterns, faults and potential outages in the GPON network.

Qualcomm tests 5G RedCap device in India

Qualcomm Technologies along with Ericsson and Airtel showcased the Reduced Capability (RedCap) device capabilities using Snapdragon X35 5G Modem-RF System and Ericsson's RedCap software on Airtel's 5G TDD network. It was the first-ever implementation and validation of RedCap in India.

RedCap is a device platform that bridges the capability and complexity gap between extreme-end 5G capabilities and mid-tier use cases, providing efficient support at 220 Mbps downlink and 100 Mbps uplink. The reduced complexity enables more cost-efficient devices, lower power consumption, longer battery life, and a smaller device footprint. This, in turn, enables the development of designs for a wide range of use cases.

Ericsson launches toolkit for differentiated 5G connectivity

Ericsson has unveiled a state-of-the-art software toolkit designed to enhance 5G Standalone network capabilities and deliver premium services with differentiated connectivity. This development addresses the growing demands of new use cases and increasing mobile user expectations for high-quality 5G experiences, which require superior network capacity and performance.

Targeted at communication service providers, the toolkit enables the delivery of use cases demanding high throughput, reliability, and low latency at agreed performance levels. These applications include lag-free mobile cloud gaming, video conferencing, live broadcasting, remote-controlled machines and vehicles, public safety services, and future extended reality applications.

The software toolkit focuses on delivering superior performance for mobile broadband services, offering differentiated experiences for new consumer and enterprise use cases, and creating programmable network performance on-demand through network APIs. It includes Enhanced Massive MIMO software algorithms, Advanced RAN Slicing, Time-Critical Communication, and 5G Core features. These enhancements improve



capacity, optimise beamforming selection, automate radio resource partitioning, ensure efficient service-level agreement fulfilment, and enhance low latency capabilities.

Ericsson's toolkit responds to evolving user demands; 20% of smartphone users, according to the latest Ericsson ConsumerLab report, are seeking differentiated 5G connectivity and are willing to pay a premium of up to 11% for elevated network performance. By addressing these demands, Ericsson's innovative software toolkit aims to revolutionise 5G connectivity, ensuring seamless and superior experiences for users engaged in a wide array of applications and services

Cisco announces new AI strategy for Webex VC platform

Cisco has announced a new AI strategy for Webex that aims to improve communication and collaboration. Unlike AI offerings that solely focus on text or documents, Webex will use real-time communications for audio and video to solve everyday challenges, such as ensuring crystal-clear audio and video calls and meetings despite low bandwidth. It also announced the launch of the new Webex AI Assistant with new capabilities that will bolster productivity and accuracy for customers.

The Webex AI strategy and Webex AI Assistant will be applied across the full Webex portfolio — The Webex Suite, Cisco Collaboration devices, Webex Contact Centre, Webex Connect and Webex Control Hub. Customers like McLaren Racing and Team DSM are testing Webex's new AI capabilities.

The company also introduced innovative technologies to boost audio and video quality. The Real-Time Media

Models in Webex enhance audio and video quality by incorporating AI for people and object recognition, movement, and gestures. The Webex AI Codec tackles audio quality challenges, ensuring crystal-clear audio even in areas with poor connectivity. Additionally, machine learning techniques improve video quality using Super Resolution, providing high-definition meetings regardless of bandwidth conditions.

Webex's approach involves harnessing the best Large Language Models based on specific use cases, incorporating a federated approach combining commercial, open source, Cisco-proprietary, and select customer models to optimise user experiences. These advancements, planned for rollout by the end of 2023, signify Cisco's commitment to revolutionising real-time communication and collaboration experiences for users across various sectors.

India needs 22 mn skilled workers to meet 5G era needs



The Telecom Sector Skill Council (TSSC) estimates that India will require 22 million skilled workers in 5G-focused industries by 2025 in areas such as cloud computing, robots, and the Internet of Things (IoT). The recently released report, 'Telecom Talent in 5G Era: Demand Supply Skill Gap Report 2023-24', revealed a current telecom demand-supply gap of 2.41 million, projected to surge 3.8 times by 2030.

India stands out globally, expecting a surplus of 1.3 million workers in the Technology, Media, and Telecommunications (TMT) sector by 2030. Currently, the Indian telecom industry employs 11.59 million, including 2.95 million corporate talent and 8.24 million blue-collar talent. The demand-supply skill gap report further highlights that across 15 top streams, network operation and maintenance and project engineering have the most corporate talent, while network operation and maintenance and sales and distribution have the most blue-collar talent.

The sector faces challenges as only 40% of Indian graduates in computer science, IT, and math meet industry employability standards due to academic-industry disparities. Arvind Bali, CEO of Telecom Sector Skill Council, emphasised the industry's potential in Tier-II and Tier-III cities and universities to bridge the demand-supply gap. India's telecom industry, contributing 6.5% of FDI inflow, is set to represent 11% of global 5G subscriptions by 2027.

The report predicted a threefold increase in software prominence in the telecom sector as technology moves into the Web 3.0 era. Trends indicate that, with the help of AI, and even more powerful 6G Network Technologies will emerge by 2023 and by harnessing the value of IoT & RPA, AI/ML, Metaverse, and 6G, the telecom and tech industry stand to reach new heights.

Optiemus plans 'Made in India' drones

Electronics and telecommunications manufacturing company, Optiemus Infracom, has entered the Unmanned Systems market with the launch of advanced drones designed and manufactured in India. The drones feature cutting-edge technology, including advanced sensors, secure communication systems, and stringent safety protocols. The company plans to invest Rs 250 million in Optiemus Unmanned Systems (OUS), a new division focusing on UAV research, development, and manufacturing.

OUS aligns with the Indian government's Make in India and Atmanirbhar Bharat initiatives. It will build on its experience and expertise in designing and manufacturing state-of-the-art drones, that would cater to a wide range of applications, including defence, healthcare, agriculture, logistics, mining, railways, and oil and gas sectors. Application areas for drones will also encompass asset management, disaster management, delivery, mapping and survey, and precision agriculture.

Netgear launches enterprise-class M4350 series switches



Netgear launched its enterprise-class AV M4350 Series Switches at InfoComm India in Mumbai. These AVoIP-certified switches feature redundant power supplies, up to 100G uplinks, and Netgear's AV user interface with pre-configured profiles for major audio, video, and lighting protocols.

The series includes IGMP Plus, Auto-LAG, Auto-Trunk, Advanced IPv4/IPv6 security, PoE+ and Ultra90 PoE++ options for up to 90W AVoIP endpoints, and intelligent thermal and acoustic controls. Netgear IGMP Plus allows out-of-the-box functionality for most multicast installations, modular switches accommodating copper, fibre, and HDMI inputs.

With over 200 switching products, Netgear enables businesses to connect various AV over IP devices, offering customisable solutions for AV needs and supporting Power over Ethernet devices like cameras and security products.

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[COVER STORY]

INDUSTRY 4.0

THE CIM CARD ERA BEGINS



Despite the infrastructure, hardware, and skillset challenges, India is navigating its way to automation by adopting Connected Intelligent Machines

BY PRATIMA HARIGUNANI

The person who invented the wheel was, definitely, a genius. But what about the person who invented those three more wheels?

Machines have been around us for so long now that we cannot even imagine how our ancestors ever managed without them. But just a few decades from now, our progeny would wonder the same thing: how did we do without CIMs – Connected Intelligent Machines – for so long?

The three new wheels here are – connected, intelligent and easy to use, and very soon we would see their various avatars throbbing inside our factories, mines, oilfields, highways and whatnot.

WHAT ARE THEY?

We already had machines. So, what makes this new

species different from what they have been doing so far? The definition, interestingly, changes as per the context but the essence is similar.

In KPMG's assessment, when we think of CIMs, we are thinking of an ecosystem of machines and plants that can talk to each other via IoT or any intelligent technology. Earlier, Individual machines could be sitting in India and Germany with no connection but now connectedness is a game-changer.

Ask Sridhar Gopalakrishnan – Senior Vice President, Hexaware Technologies and he says that a CIM is an autonomous device that is part of a large network of such devices. It is intelligent in the sense that a CIM will make decisions on its own, respond to incentives embedded in the network, maintain trustworthiness and learn from other devices.

Human mediation is required between the output of a machine and the input of another, especially when the output is not deterministic.



“CIMs will dynamically create personalised consumer experiences based on user contexts and interactions with other CIMs in the value chain.”

Sridhar Gopalakrishnan

Senior Vice President, Hexaware Technologies



THE ADVANTAGES

- Avoidance of costly unplanned downtime
- Savings on service costs
- Reduced service time and fast responsiveness
- Immediate breakdown alerts and fixes
- Holistic communication across the machine footprint
- Services inside products- new revenues

“Machines today are specific operators with clearly defined process steps to follow. Human mediation is required between the output of a machine and the input of another, especially when the output is not deterministic. With CIMs, this mediation will be reduced substantially. CIMs will also be context-aware and take personalised prescriptive actions.”

Sanjay Lodha, Chairman and Managing Director, Netweb Technologies explains this new paradigm from a data perspective. “The deluge of data is everywhere. Needless to say, we will need many intelligent machines to make sense of the continuous flow of incoming data. In recent years, the popularity of CIM has been gaining traction, with the concept of IoT becoming a reality and no longer just a theoretical construct. As per a report by Ericsson, CIMs are expected to be a crucial part of life by 2030, with consumers’ predictions.”

DOES 5G MATTER?

In the reckoning of Sam Fenwick, Principal Analyst, Opensignal, the importance of 5G and connectivity to a CIM depends on several interrelated factors including the machine’s function and location, where its intelligence resides and whether the flow of data between it and the user (or other machines) needs to take place in real-time, and how long the machine can function in the absence of connectivity.

“If the machine just requires connectivity for infrequent software updates and the transfer of information on a non-real-time basis, then the consequences of an hour-long interruption in connectivity are very different to those experienced when a drone is being used to provide real-time aerial footage of an ongoing incident.”

For telecom companies too, this change is a big shift as they are the key enablers through the Industrial Internet of Things (IIoT) and 5G, a KPMG report points out. 5G, Artificial Intelligence (AI) and IIoT are adjacent technologies that are big enablers for connected intelligent machines.

Fenwick argues how the degree to which the users of a machine can expect it to nearly always be connected strongly influences the importance of connectivity to its function. “A machine that will always stay within the confines of its owner’s premises and can be supported



“CIMs can streamline order processing, reducing waiting time and enhancing the accuracy of orders, particularly in high-traffic quick-service restaurants.”

Manoj Gupta

Associate VP – IT, Restaurant Brands Asia

by a hardened private network — one that can be engineered to eliminate all coverage black spots — is at one extreme of this continuum. In such a case, it can be designed and used under the assumption that connectivity will always be present, potentially allowing much of its intelligence to be present in the cloud — thereby reducing the machine’s cost and complexity. However, if the machine’s function requires ultra-reliable and low latency communications, then its intelligence has to sit closer to the network edge.”

CIM frequently need to transmit a vast amount of data quickly, Lodha explains. “The prominent features of 5G, such as high data rates, low latency, network slicing and increased connectivity are ideal to ensure that CIM survives and thrives in the long run. IIoT plays a crucial role in enhancing productivity, supporting predictive maintenance, ensuring safety and supply chain and inventory management.”

“One of the key things to understand about 5G in this context is that it is still developing as a technology. For example, work is underway on 3 GPP Release 18 — the first Release to be branded as 5G Advanced. In addition, while the first 3GPP Release to include the standards for 5G was Release 15, the bulk of the major work on supporting edge computing with 5G didn’t start until 3GPP Release 17.” Fenwick reasons.

In addition, the bulk of initial 5G deployments worldwide focused on using 5G new radio technology

in combination with 4G core networks, referred to as 5G non-standalone access, as opposed to 5G standalone access — where 5G new radio is used together with a 5G core network. Upgrading to the latter is complex and difficult, but enables new capabilities such as network slicing.

CHANGING THE GAME

When we comb through the 2022 KPMG Whitepaper, Connected Machines: A Game Changer in Industrial Manufacturing, we see that these machines bring several advantages to different entities.

Cost savings for manufacturers. Remote maintenance for dealers and service providers. Reduced downtime and service costs for end customers. For instance, Siemens Electronics Works, Germany saw a 140% jump in their factory output between 2017 and 2021. Similarly, Schneider Electric, Indonesia saw a 70% improvement in supplier service rate.

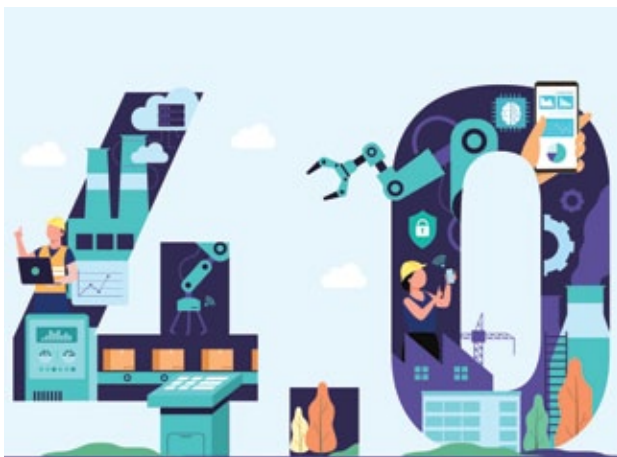
Their strength lies in what they bring to enterprises, the KPMG report reminds us. From reducing downtime to boosting efficiency to even enhancing end-customer experience, they bring a lot of advantages. Even unexpected ones: the need for less maintenance staff and hours, since everything is automated, or adding a new revenue pipeline through servitisation. Now someone who sells a compressor to a company can also offer proactive repair, thanks to real-time updates on the equipment’s health.



“Prominent features of 5G, such as high data rates, low latency, network slicing and increased connectivity are ideal to ensure that CIM survives and thrives.”

Sanjay Lodha

Chairman and Managing Director, Netweb Technologies



CIM CHALLENGES FOR INDIA

- **Regulatory framework:** India lacks a comprehensive policy for CIMs, leading to fragmented and conflicting regulations across sectors and regions. Addressing aspects such as standards, certification, data protection, and ethics is crucial.
- **Infrastructure bottleneck:** Despite ongoing 5G efforts, delays in infrastructure deployment can impede the growth of connected devices, relying on high-speed, low-latency communication.
- **Interoperability and standards:** The absence of standardised protocols makes seamless communication between devices challenging. India must adopt or develop industry-wide standards to ensure compatibility and enhance user experience.
- **IPR issues:** Protecting intellectual property rights (IPR) is essential for innovation. While India has made progress, concerns persist regarding patent, copyright, and trademark enforcement, especially in the tech sector.
- **Talent and awareness:** Specialised training programs in emerging technologies like AI, IoT, and machine learning are lacking. Although India produces numerous engineers, there is a demand for expertise in these specific areas.

It is not just heavy-duty industries where they find relevance. Even verticals like healthcare, FMCG, food and retail can tap them for various outcomes. Manoj Gupta, associate vice-president of IT at Restaurant Brands Asia (formerly known as Burger King India) adds how CIMs can streamline order processing, reducing waiting time and enhancing the accuracy of orders. This is particularly valuable in high-traffic quick-service restaurants.

“Intelligent machines can handle routine customer interactions, such as taking orders and processing payments, freeing up human staff to focus on more complex tasks and providing better customer service. These Machines can collect and analyse data on customer preferences, ordering patterns, and operational efficiency, enabling data-driven decision-making for menu optimisation and business strategy. Also, they can monitor and predict equipment maintenance needs, reducing the risk of equipment failures that could disrupt service.”

Even leasing companies can tap this new form of intelligence. Case in point, how Hexaware enabled improved tracking of vehicles for one of the largest leasing companies in Europe finding difficulties in monitoring the leased vehicle's location, thereby impacting the bottom line due to the high cost of recovery.

Sensors were attached to the vehicles to capture their location using a telematics device. Data points about harsh braking, engine temperature, idle time and distance travelled were captured. The idle time data was integrated with the Idle fuel flow factor to calculate the fuel savings. Information and details about every breach were recorded. The details helped reduce the idle time for leasing the vehicles. According to the company, the initiative also helped save fuel costs by 2–8% and maximise equipment uptime and lifespan.

CIMs are the next stage of evolution in increasing productivity, emphasises Gopalakrishnan. “In manufacturing, CIMs can run completely autonomous production lines and supply chains, propagating the response to market movements across the value chain. In services industries, CIMs will dynamically create personalised consumer experiences based on user contexts and interactions with other CIMs in the value chain.”

ARE THEY EASY TO START?

Not really. There are a host of aspects to consider before enterprises can think of putting their feet up and leaving



“Integration issues are a big fence to cross for anyone thinking of embracing CIM and one needs to explore this before buying any such machines.”

Bhoopendra Solanki

Chief Information Officer, Sakra World Hospital

everything in the hands of these smart pixies around. With more machines talking to each other with sensors and software sprawled everywhere, security becomes a big chink in the armour now. Recent data by SonicWall shows a 133% surge in ransomware along with a 311% jump in IoT attacks in India alone.

KPMG's analysts also point out security and control issues as an important concern, especially since the smarter a machine gets, the easier it can become for attackers to exploit a vulnerability. Plus, chances are thin that an enterprise would go this route via greenfield investments. Most just choose to enhance existing infrastructure through the addition of sensors and connectivity.

Also, integration issues are a big fence to cross for anyone thinking of embracing this huge shift. “Before raising any process to buy any such machines, we find out the possibilities of integration with the system. So as soon as we receive such machines we connect into the system for its optimal use,” shares Bhoopendra Solanki, Chief Information Officer, Sakra World Hospital.

Then there is the gap in interoperability. This area requires the creation of common ontologies and data formats, Gopalakrishnan contends. “Without standardisation, we should be concerned about how CIMs interpret information. For CIMs to be effective, interpretations must be commonly understood and specifically implemented by each machine. Its actions will influence other machines in the network. So, it is important to ensure that the resulting network complexity does not become unmanageable. Detecting path dependencies,

simulating outcomes and taking early corrective steps will be crucial.”

Not to forget, the industry would need new skills to steer these new wheels too. Sanjoy Paul, Program Director – Technology, Hero Vired. “The adoption of connected intelligent machines across industries, especially in manufacturing, would necessitate addressing several skill gaps and require upskilling in key areas. Technical expertise in Full Stack Development (FSD) would be essential. Full Stack Developers possess the knowledge and skills required to work on both the front-end and back-end of applications and systems. This proficiency is vital for building and maintaining the software components of connected intelligent machines.”

He also adds how a strong understanding of DevOps practices would be crucial to ensure operational efficiency. Proficiency in system integration and management is key.

“Full Stack Developers and DevOps professionals play a pivotal role in integrating new technologies with existing systems and ensuring their seamless management. This involves ensuring that all components work cohesively and efficiently, minimising disruptions in operations.” Lodha avers: “While the talent pool is vast, there needs to be more advanced, specialised skills for the next generation of connected technologies.”

Lodha also highlights areas like visibility and privacy. “The visibility issue arises when the CIM are not transparent or accountable for their actions and decisions. Some CIMs can use complex and opaque algorithms that need help understanding or interpreting. This can make

Security and control issues are key concerns, especially since the smarter a machine gets, the easier it can become for attackers to exploit a vulnerability.



“Expertise in front-end and back-end applications and systems is vital for building and maintaining software components for connected intelligent machines.”

Sanjoy Paul

Program Director – Technology, Hero Vired

verifying, validating, or debugging these machines and trusting their outcome or behaviours difficult.”

Since the CIM gathers data, there are pertinent questions regarding who is accessing the data, how it is being used, and if it is sold or shared with third parties, he warns. “Moreover, there is also the possibility of misuse in surveillance and monitoring, resulting in invasive tracking of individuals without their knowledge or consent.” He also observes how the existing law does not cover the intricacies and challenges connected intelligent machines pose. “New regulations are needed to ensure the safe and just use of technology.”

However, current signs of adoption hint that interest and investment, are pouring strongly into this lane. KPMG’s analysts have noted how companies are already, visibly, implementing such machines. Paul echoes the growing interest. “We have observed a notable surge in demand for skills in FSD, DevOps, and cybersecurity as industries increasingly embrace connected intelligent machines.”

Gupta also lets on the path laid out ahead. “Regarding our own QSR operations, we are actively considering and, in some cases, already using CIMs. We recognise their potential to improve efficiency, reduce costs, and enhance the overall customer experience. However, the specific implementation and extent of their use may vary based on the type of QSR, its size, and the technological infrastructure in place. The pace of adoption will depend on factors like the availability of suitable technology solutions, cost considerations, and alignment with our business goals.”

India is getting into top gear here too.

As digitisation deepens across industries, CIMs open tremendous opportunities for creating new AI models and, ensuring interoperability across systems, data standardisation, security and network optimisation, portends Gopalakrishnan. “The government’s infrastructure, ‘Make in India’ and ‘Digital India’

investments augur well for the future of CIM tech development in the country.”

Lodha seconds that. “India has a booming hardware and electronic manufacturing industry duly supported by government initiatives. Many global companies have already set up assembly plants in the country. India is already home to several global and domestic OEMs in the automobile, electronics, and industrial machinery sectors. These OEMs adopt connected intelligent machines to improve productivity, efficiency, quality, and safety.”

He also points out that Hindustan Unilever Limited has launched the ‘Reimagine HUL Program’, which aims to transform its business from a linear FMCG value chain to an intelligent enterprise built on a connected consumer, customer, and operations ecosystem. “However, India will need more OEMs in other sectors, such as healthcare, education, and entertainment, to create more demand and innovation for connected intelligent machines,” Lodha says.

We would also need some more work to be done on the chip level. As Lodha notes: “Companies such as Micron Technology, Vedanta, and Foxconn are actively exploring the possibilities of setting up large semiconductor chip plants in India. However, as of now, India has a limited capacity for designing and manufacturing chips for CIMs. Most of the chips used in India are imported from countries like China, South Korea, Taiwan, and the United States.”

Most companies need to start at some point, as KPMG has observed. It is good to be ready for the transformation process. After all, CIMs could be the new future for not just machines but the humans and companies around them.

There is no point in spinning the wheel when the world is moving on a new axis. Better have these three wheels, than be a third wheel. 🚲

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KEY DISCUSSION POINTS

- Connected Future
- 5G and Beyond
- Satcom Innovations
- Monetization and User Experience
- Threats and Countermeasures
- Digital Transformation
- IoT in Business
- Real-world Applications
- Sustainable Connectivity

KEY HIGHLIGHTS

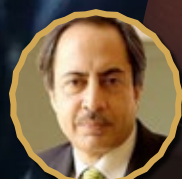
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HALL OF FAME
TELECOM PERSON
OF THE YEAR



[INTERVIEW]

CLOUD



Siki Giunta

EVP, CloudSMART, Industry Cloud Consulting,
Google Ecosystem Unit, HCL Tech

“Cloud is not inherently vulnerable”

*A seasoned executive with over 20 years of experience in international operations, marketing and sales, **Siki Giunta** leads CloudSMART Business, Industry Cloud and the Google Ecosystem Business at HCL Tech. In an interaction with **Shubhendu Parth**, she talks about the technologies driving Cloud, challenges of Network Cloudification, security issues, and the impact of Cloud operating models and data engineering on generative AI. Excerpts:*

How is the industry Cloud evolving and what are the key technologies driving the trend?

Cloud is evolving to become the optimal business platform for companies that are transforming to grow at scale. Each industry, be it life sciences, retail, manufacturing, financial services, or media, has its drivers but the one thing that every industry has in common is the need for speed. Accelerated response to compelling events, whether they are global like a pandemic or unique to a business like a competitive threat, is a requirement for businesses to act quickly.

To succeed, to achieve desirable business outcomes, organisations are prioritising the ability to analyse the volumes of collected data, use analytics to discover insights and then apply these constantly changing insights to innovate and drive profits – we say to supercharge progress by making innovation a habit.

We live in a “5-star culture” – the impact of social media and the ever-present opportunity for customers, patients, and partners to rate a company or a product creates pressure to improve services and products. Success requires innovative technology that is dependent on using the Cloud as a business platform.

What are the top workload requirements that are driving the adoption of the Cloud by businesses beyond the hygiene remote working and integrated communication needs?

Each industry is unique, but the drivers are consistent: increase the productivity of knowledge workers, improve price-performance ratios, deepen customer engagement, and streamline processes. From a technology perspective, 5G is estimated to be a USD 12 trillion market. 5G smartphone subscriptions are likely to reach 3 billion in 2026. 5G brings innovation and dramatic transformation to how we live and work having 10-20 times higher data speeds with greater device connectivity. It is also essential to realise smart cities, smart hospitals, smart manufacturing and more.

Another trend is Generative AI (GenAI). Even school children are aware of ChatGPT and similar technology for the consumer market. Our clients are interested in the enterprise adoption of GenAI. We are engaged in many projects from consumer safety to clinical trials to investor portfolio management. Our clients and HCL Tech are concerned with ethical use and related security and compliance issues.

Taming the tsunami of data is a powerful trend for every business. Here we see data gravity propelling successful GenAI initiatives. Many companies and service providers are improving skills in developing large language models (LLMs) but data gravity is the necessary ingredient in the GenAI recipe for success.

What are the primary obstacles stopping faster adoption and utilisation of Cloud technology and what can businesses do to overcome it?

Cloud adoption is happening very quickly in many



More agile, cost-effective and adaptable networks are fundamental to successful Cloud initiatives.

If organisations neglect to tie Cloud deployments to business outcomes, migrations can fail to return measurable value and workloads may end up back on-prem.

industries in most regions of the world. We are partners with all the hyperscalers, and they are seeing an increase in the number of new customers and continued subscriptions from existing customers. But I think there are situations where businesses hit a wall. First, IT may lose sight of the strategic intent driving the move to the Cloud. Second, technology adoption requires an experienced team and while their workforce may have the technical training, they may not have the experience. Third, ever-changing business requirements create the need for continuous modernisation and previous decisions have sometimes left businesses with technical debt – depressing the appetite for innovation.

Our research indicates that the collaboration between IT and the business is not happening consistently which makes it difficult for leadership to stay the course. Businesses may sometimes also have to deal with unexpected costs of Cloud and organisations may not always have experienced financial operations – Finops – to optimise their Cloud spend.

My advice to these companies will be to find a trusted partner who can help them stay on the course and engage business and IT leadership together to extract all the value from the move to the Cloud.

Recent digitalisation efforts have seen organisations shifting network functions from traditional hardware-based systems to software-based ones. What challenges does Network Cloudification bring with it?

Network cloudification, also referred to as network function virtualisation is the process of transforming traditional network infrastructure into more agile, Cloud-based solutions. This represents a shift in how network services are designed, deployed, and managed.

The CloudSMART SMART Ways, Connected Cloud and Secure Cloud, focus on security and compliance and provides guidance and services to protect users, consumers and partners when doing business in the Cloud. The goal of network cloudification aligns with the

modernisation of applications and data. More agile, cost-effective and adaptable networks are fundamental to successful Cloud initiatives.

What about the security challenges that the Cloud environment brings in?

Indeed, people and companies in early-stage Cloud adoption often express security concerns. Cloud is not inherently vulnerable. The network considerations for accessing the Cloud have matured and are less reliant on hardware to manage access with user access managed by sophisticated multi-authentication protocols and digital IDs. Today, we secure applications by authenticating user access. In general, security depends on how well systems are implemented, configured, and managed – whether it is a legacy or Cloud implementation. We take security very seriously and find clients appreciate our approach to security and compliance. We believe that properly configured and managed Cloud solutions can be as secure.

A recent HCL Tech report indicates that 24% of organisations are considering repatriation due to a lack of optimisation of workload. What steps should businesses take to become Cloud-native?

When organisations neglect to tie Cloud deployments to business outcomes, migrations sometimes fail to return measurable value and workloads may end up back on-prem. Often, organisations think about how to get to the Cloud but overlook the required operational know-how to securely operate in the Cloud. The second reason for repatriation is the expectation that Cloud costs less. The cost of the Cloud is relative to how the applications are implemented, how resources are being used, and the ability of the company to make sense of different pricing scenarios.

Avoiding repatriation requires leadership to define the relationship between the Cloud project and the strategic intent of the business. For example, if the strategic intent is to improve customer service, the decision to repatriate may delay the business outcome and cost the company profits over time. Having a financial plan for the Cloud is important.

GenAI models require massive processing power and memory and Cloud can scale up or down as needed, which is important for training models.

How does advancement in Cloud operating model and data engineering underscore the success of generative AI?

The Cloud operating model is essential for many reasons, but fundamentally Cloud provides scalability, accessibility, and elasticity to enable generative AI. GenAI models are computationally intensive and require processing power and memory and Cloud can scale up or down as needed, which is important for training models. The GenAI models are hosted in the Cloud and are accessible with APIs. The accessibility of the Cloud makes it easier for developers to integrate generative AI into applications. Cloud also offers elasticity – the ability to allocate resources dynamically and this is essential for handling spikes in demand as GenAI applications find their way into the mainstream.

The success of a project that incorporates GenAI is largely dependent on data engineering – the ingestion, storage of the data and data quality and validation. Data gravity, the ability of data to attract additional data, applications and services as the data sets grow, requires the flexibility of Cloud. Language models prompting the data are most effective when the data sets are vibrant and robust.

What is HCL Tech doing in the Cloud space and Generative AI?

As an IT services company, HCL Tech collaborates with clients on a variety of projects. Our job is to advise them and ensure the underlying Cloud platform – the data, governance, and security – is accessible and secure to support GenAI initiatives. For example, we have deep expertise in Integrated Management Systems. GenAI can improve how organisations integrate all current systems in one place within an organisation to prevent unforeseen conflicts between systems and enable them to work as a whole, boosting efficiency and productivity.

Engineering is in the DNA of HCL Tech. We are working on the best ways to use GenAI for code generation. There are already commercial implementations like GitHub CoPilot, Google CodeGen, or Generative AppBuilder. These will generate the scaffolding. We see a different role for HCL Tech. While GenAI will generate a lot of code

you still need to validate the code before it is deployed into production. Trusted application development must meet the business requirements and identify bugs. Our engineers are automating the inspection of GenAI-generated code and how to accelerate testing and apply modifications with its help.

What investments is HCL Technologies making in building GenAI capabilities and strengthening Cloud technology?

We have built on our model – the HCLTech Cloud Native Labs – and will be offering a Lab just like it specifically geared to GenAI knowledge transfer and hands-on learning for clients. The Lab experience surrounds the client with our best people and the processes enabling clients to generate LLMs, core to GenAI, and other sessions that underscore the importance and operation of data engineering. Data engineering is critical for successful generative AI projects.

We are investing in our people by working with our global ecosystem of partners to train and certify our engineers on modern generative AI tools and processes. We have many examples of successful GenAI projects today.

Telcos are both users and drivers of the Cloud. What solution does HCL Technologies have to support the TSPs?

Telcos drive Cloud adoption through initiatives such as OSS, BSS modernisation, NFV, 5G, MEC and IT-OT convergence, which rely heavily on Cloud infrastructure provided through AWS, Microsoft, and Google as well as traditional technology OEM partners. The CloudSMART SMART Way – Connected Cloud – provides the platform and ideal ecosystem that partners require to operate these technologies. Enabling Cloud-native transformation for the internal IT OSS/BSS transformation services will optimise their operations and improve their abilities. IT services are complemented by business services and services like 5G, Edge and IT/OT converge to leverage Cloud, Edge, and advanced analytic use cases. 🌐

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LT GEN DR S P KOCHHAR

NAAS: THE FUTURE OF NETWORKS

This cloud-based networking paradigm is here to stay and transform modern IT, enhancing flexibility, security, and efficiency for businesses globally



Network as a Service (NaaS) is a cloud-based service model that enables users to easily operate the network and achieve the outcomes they expect from it without owning, building or maintaining their infrastructure. NaaS represents a paradigm shift in networking, providing organisations with a powerful tool to address challenges such as recurring capital costs, staffing and skills shortages, and the increased complexity associated with securing remote access for employees and managing multi-cloud environments.

It brings software-defined networking (SDN), programmable networking, and API-based operation

to WAN services, transport, hybrid cloud, multi-cloud, Private Network Interconnect and Internet exchange points. NaaS is capable of replacing several legacy network configurations such as multi-protocol label switching or MPLS and virtual private networks or VPNs, as well as on-premises networking hardware like firewall hardware and load balancers.

NaaS providers enable their customers to set up their networks without hardware, instead, using software delivered over the Internet. NaaS services can range from managed software-defined WAN and network access including wireless to security, unified communications services and more.

“

NaaS has the potential to drive innovation and efficiency in the telecom industry and beyond, making it a technology to watch closely in the coming years.



By offering a flexible, scalable and efficient networking solution, NaaS is poised to become a cornerstone in the modern IT landscape.

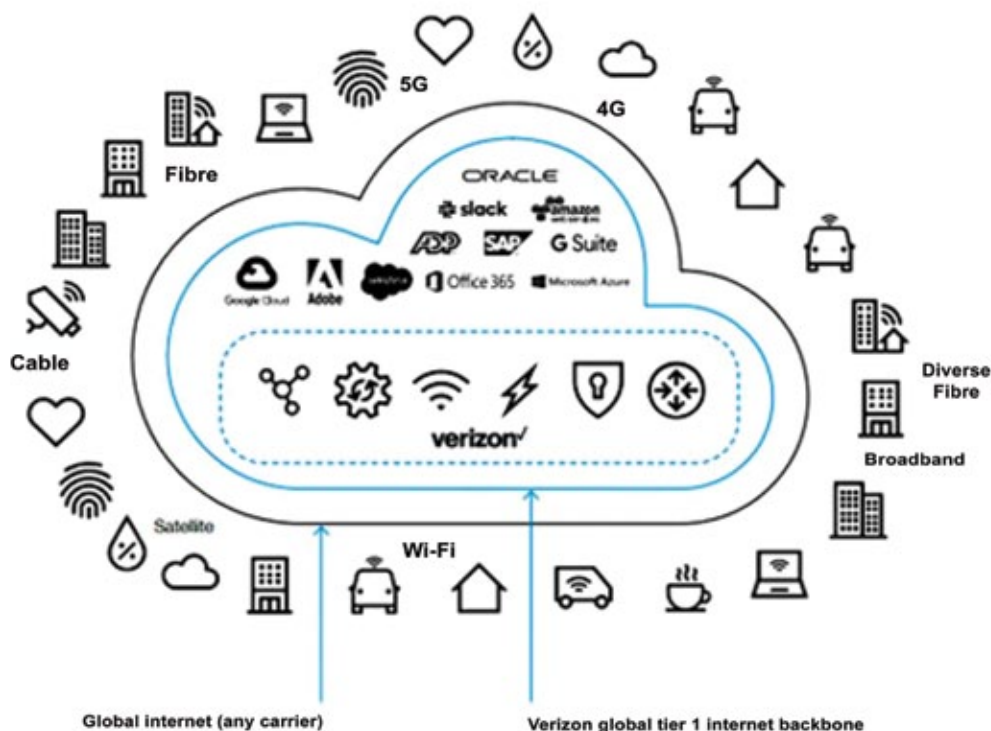
WHY DO WE NEED NAAS?

To appreciate NaaS fully, it's essential to trace the evolution of networking. Traditional networks relied heavily on physical components like fibre optics, copper cables, routers and switches. However, the advent of SDN introduced a transformative approach, enabling the management of network traffic through software and orchestrating the interactions between network components. This, coupled with the emergence of Network Function Virtualisation (NFV), which allowed network functions to be executed through software rather than dedicated hardware, laid the foundation for NaaS. The synergy between SDN and NFV ushered in an era where service providers could offer NaaS, heralding a new era of networking possibilities.

NaaS offers a multitude of benefits to businesses. One of its key advantages lies in IT simplicity and automation. By continuously integrating new features and capabilities, NaaS keeps businesses updated with the latest technological advancements. Additionally, it ensures enhanced security by integrating network and security solutions, creating a robust defence against cyber threats with advanced firewall capabilities.

Moreover, NaaS provides valuable visibility and insights through proactive network monitoring, powered by AI technologies. This allows businesses to gain crucial insights into network performance and user behaviour. The service also guarantees an improved application experience through AI-driven network optimisation,

Network-as-a-Service - Digital, Global and Invisible



Source: Network-as-a-Service explained. Verizon; 2021.

A reliance on specific features from a single NaaS provider can result in vendor lock-in, inhibiting the flexibility to switch to alternative providers.



WHY NAAS?

- **IT simplicity and automation:** By integrating new features and capabilities, NaaS ensures that businesses stay at the forefront of technological advancements.
- **Enhanced security:** The integration of network and security solutions creates a fortified defence against cyber threats, bolstered by advanced firewall capabilities.
- **Visibility and insights:** Proactive network monitoring, augmented by AI-powered technologies, provides insights into network performance and user behaviour.
- **Improved experience:** AI-driven network optimisation guarantees a seamless user experience for critical applications.
- **Flexibility:** NaaS offers the agility needed to promptly adapt to changing business requirements.
- **Scalability:** The ability to expand network infrastructure effortlessly, without the burden of acquiring new hardware, makes scaling operations a breeze.
- **Anywhere access:** The cloud-based nature of NaaS ensures accessibility from any corner of the globe.

ensuring seamless user interactions with critical applications.

Flexibility is another major perk of NaaS. It offers the agility required to promptly adapt to changing business requirements, enabling businesses to stay responsive in dynamic market environments. Scalability is simplified with NaaS, allowing for the effortless expansion of network infrastructure without the need to acquire new hardware. This streamlined scalability process makes expanding operations smooth and efficient.

Furthermore, NaaS's cloud-based nature ensures accessibility from any location worldwide. This means businesses can access their network services from anywhere, providing a level of convenience and connectivity crucial in today's global business landscape.

CORRELATION OF NAAS AND 5G

The intricate correlation between 5G and NaaS represents a transformative shift in the telecommunications sector. At the heart of this synergy lies the ability of NaaS to amplify the inherent capabilities of 5G through dynamic network configurations, enabled by SDN. This agility ensures rapid service deployment and optimal resource allocation in real time.

Furthermore, by harnessing Network Functions Virtualisation, NaaS eliminates the dependency on dedicated hardware, making 5G deployments more cost-efficient. The convergence of NaaS and 5G also shines in the realm of edge computing, where NaaS provisions resources closer to end-users, enhancing the performance of latency-sensitive 5G applications.

This collaboration extends to 5G network slicing, with NaaS dynamically managing slices to cater to diverse service requirements, from



NaaS can amplify the inherent capabilities of 5G through dynamic network configurations, enabled by SDN.

IoT to high-definition streaming. Security, a paramount concern in 5G, is bolstered by NaaS's integrated security features, ensuring robust data protection and resilience against threats. Additionally, in Multi-access Edge Computing or MEC environments within 5G, NaaS's ability to manage computational resources further optimises latency and localised data processing.

Additionally, NaaS is instrumental in realising the "network as a sensor" concept. By virtualising sensing capabilities, NaaS transforms networks into adaptive sensors, enabling real-time data collection and the 6G vision of creating authentic digital twin representations of the physical world with multi-layered maps of our environment. In short, NaaS acts as a bridge, seamlessly connecting the present capabilities of 5G with the future potential of 6G.

THE FUTURE PROPOSITIONS

The future of NaaS appears exceedingly promising. A report by Forrester reveals that nearly two-thirds of IT leaders are actively transitioning to NaaS and other "as-a-service" models. Much akin to the meteoric rise of SaaS, NaaS is poised to revolutionise networking functions in the decade ahead, ushering in an era of heightened connectivity and efficiency.

Challenges in NaaS implementation: While NaaS offers a plethora of benefits, it is not without its challenges. Compatibility issues may arise when attempting to integrate legacy systems with NaaS infrastructures. On-premise data centres may not seamlessly mesh with cloud-based NaaS models, leading to potential operational hiccups. Furthermore, a

reliance on specific features from a single NaaS provider can result in vendor lock-in, inhibiting the flexibility to switch to alternative providers.

NaaS vs. other service models: It's crucial to distinguish NaaS from other service models like Infrastructure as a Service (IaaS) and Platform as a Service (PaaS). Unlike IaaS, which provides infrastructure resources, or PaaS which offers software platforms, NaaS's primary focus is on delivering networking services. It does not encompass the provision of business software or data storage, thus carving its unique niche within the realm of cloud services.

Relation with SASE: Secure Access Service Edge (SASE) aligns seamlessly with NaaS infrastructures. SASE focuses on securing individual applications, making it an ideal complement to NaaS. NaaS providers can secure specific applications without compromising performance, thereby ensuring a seamless and secure networking experience.

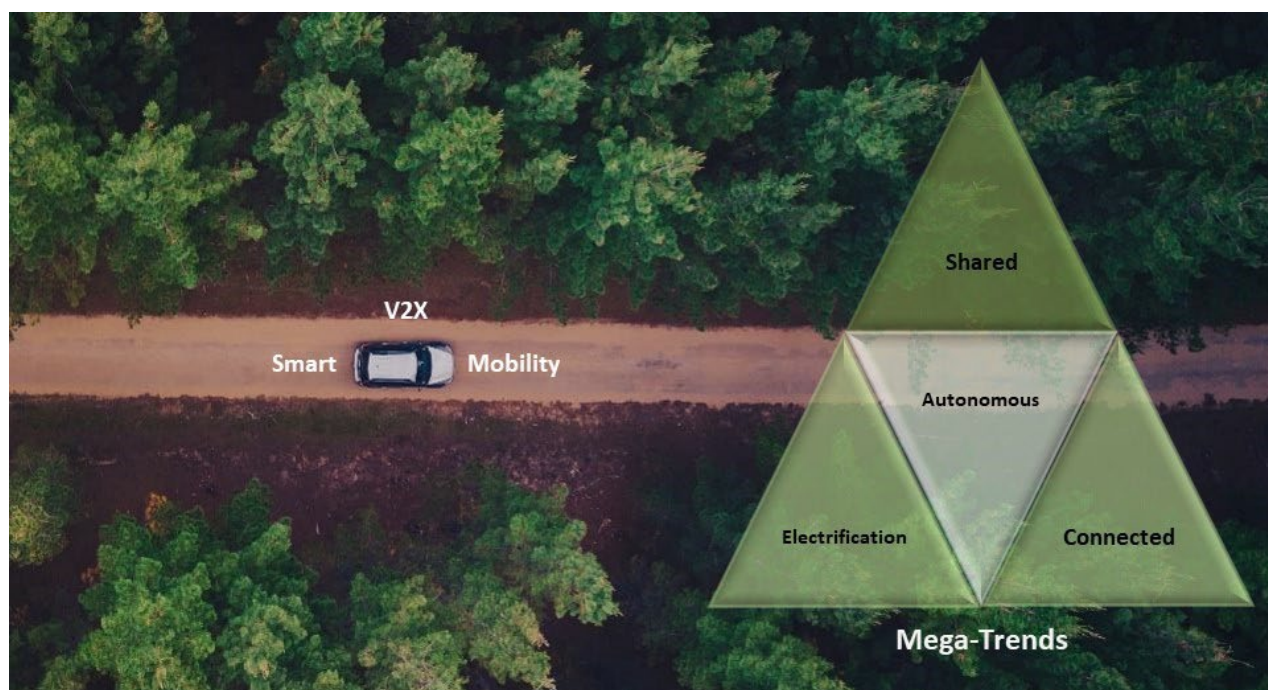
NaaS stands as a transformative force reshaping how businesses approach networking. By offering a flexible, scalable and efficient networking solution, NaaS is poised to become a cornerstone in the modern IT landscape. Its potential to drive innovation and efficiency in the telecom industry and beyond is undeniable, making it a technology to watch closely in the coming years. With NaaS, the future of networking is brighter and more adaptable than ever before. 🌟

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Driving the future: Automotive industry's digital revolution

India's automotive sector is fast embracing connected technologies and V2X advancements to improve safety, efficiency, and user experience



BY JOHN MARTIN

The automotive industry is experiencing a profound transformation, driven by the rapid integration of cutting-edge technologies. This evolution is reshaping the automotive landscape, making it smarter, more environmentally friendly, safer, and more efficient, while significantly enhancing the overall user experience. Central to this

transformation is connected technology, which not only fuels today's most innovative advancements but also charts the course for the industry's future.

Connected technology has ushered in the era of the Internet of Things (IoT), Artificial Intelligence (AI), and Machine Learning (ML) within vehicles, manufacturing

Cellular V2X technology provides real-time vehicle connectivity, offering a host of conveniences to vehicle and fleet owners.

Real-time connectivity is pivotal for Advanced Driver Assistance Systems, enabling real-time processing of data from cameras, sensors, radar, and lidar.

Types of V2X Communication



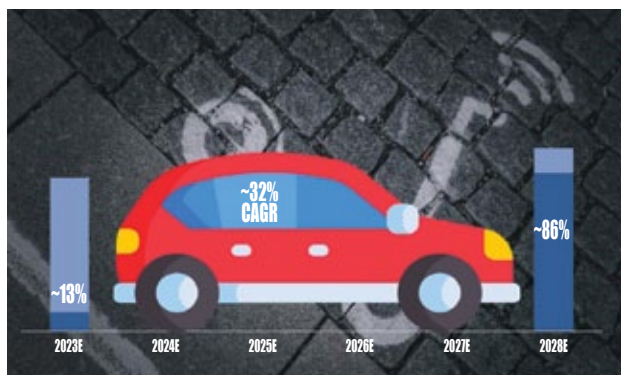
Source: CyberMedia Research, 2023.

significant inroads in India, accounting for a substantial share of the market, with passenger vehicles at 30% and a yearly growth rate of >60%.

Cellular V2X (C-V2X) technology provides real-time vehicle connectivity, offering a host of conveniences to vehicle and fleet owners. These include features like remote engine activation for cabin pre-conditioning, driving behaviour enhancements, and the ability to plan routes with estimated travel times. Moreover, V2X offers robust safety features, including vehicle tracking, geo-fencing, alerts for towing or theft, and predictive maintenance capabilities.

The electric vehicle (EV) sector, a catalyst for significant industry transformations, has witnessed exceptional growth. Overall, the electric passenger segment has surged by >120%, and the electric two-wheeler segment has seen a growth of >40%. Roughly 80% of electric vehicles in the passenger and two-wheeler segments are equipped with connected technology. This seamless integration empowers consumers with real-time information, enabling them to meticulously plan inter and intra-city routes with access to charging stations, select traffic-efficient pathways, and ultimately optimise both EVs – battery life and range.

C-V2X Volume Forecast: India Market



Source: CyberMedia Research, 2023.

processes, and mobility infrastructure. Through these software-driven technologies, vehicles can communicate seamlessly with each other and the cloud, elevating the entire ecosystem to unprecedented levels of intelligence.

V2X GAINS GROUND

A prime example of this revolution is the concept of Vehicle-to-Everything (V2X), which is reshaping the automotive sector and enhancing mobility intelligence. According to CyberMedia Research (CMR), V2X technology is making

V2X technology is also making waves in shared mobility services, particularly in the electric vehicle sector. Connected technology enhances ride-sharing, mid- and last-mile delivery, and rental services, delivering lesser travel time, convenience, improved performance, and enhanced efficiency.

Besides, safety remains paramount in the sector with Advanced Driver Assistance Systems (ADAS) gaining rapid adoption in India, surpassing 350%. Real-time connectivity is pivotal for processing data captured by various cameras, sensors, radar, and lidar, especially as ADAS evolves towards higher levels of autonomy.

THE ERA OF INDUSTRY 4.0

As the automotive industry advances into Industry 4.0, manufacturing processes continue to evolve. The transition began with the shift from traditional mass

Connected technology enhances ride-sharing, mid- and last-mile delivery, and rental services, delivering lesser travel time and convenience.



IN BRIEF

- **V2X revolution:** Vehicle-to-Everything, especially Cellular V2X, enhances vehicle connectivity, safety, predictive maintenance, and real-time communication.
- **EV-led innovation:** Connected technology empowers EV users with real-time data, optimising routes, charging, and battery life.
- **Safety through connectivity:** Advanced Driver Assistance Systems utilises data from cameras, sensors, radar, and lidar for enhanced driving assistance.
- **Industry 4.0:** By integrating IoT, big data, cloud computing, and AI, the automotive industry can optimise production, quality control, and maintenance.
- **Evolving tech:** 5G and upcoming 6G technologies can enable high-speed cloud connectivity, enhancing V2V and vehicle-to-infrastructure (V2I) communication.

production to the adoption of digital technologies like computer-aided design and manufacturing, accompanied by automation.

Industry 4.0 introduces a wealth of innovations, including the integration of machines embedded with the IoT devices, the utilisation of big data, the harnessing of cloud computing capabilities, and the application of artificial intelligence. Today, smart factories exemplify Industry 4.0, featuring interconnected machines that enable predictive maintenance and streamline quality control. Machine learning optimises production processes, and the introduction of 3D printing and autonomous robots is revolutionising vehicle design, manufacturing, and maintenance.

The subsequent phase, Industry 5.0, underscores the industry's commitment to human-machine collaboration and advanced automation. This new chapter in automotive manufacturing emphasises cooperation between humans and machines, heralding even more profound transformations in the years to come.

In the near future, the automotive industry will become increasingly reliant on digitalisation, embracing real-time, high-speed connectivity. With the introduction of 5G and plans for the next generation of connectivity like 6G, the industry is set to heavily leverage cloud connectivity, enabling instant data transfer and responses. The reduced latency will bolster vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication, thereby enhancing road safety and ushering in features like vehicle autonomy and augmented reality.

This transition promises a future of smoother operations, enhanced consumer experiences, greater safety, and the integration of sustainable energies. The automotive industry is on the brink of a profound and exciting transformation that will redefine the way we experience and interact with vehicles. 🌟

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Beyond 5G, into a faster future

Future telecom services will enable quicker downloads, higher remote work efficiency, and seamless access to cloud-based services and apps



BY VIKAS SHARMA

From the invention of telephones to smartphones, computers, and social media platforms, the advent of the digitalisation and Internet has certainly changed the way we communicate with each other. In this context, taking digital transformation and connectivity to new heights, the government launched 5G technology—a fifth-generation wireless technology that promises faster

speeds, lower latency, and the ability to connect more devices simultaneously—in 2022 for various industries, with telecom being no exception.

Currently, India is the world's second-largest telecommunications market, with a subscriber base of 1,170.75 million in January 2023, and has registered strong growth in the last decade. Indeed, 2G, 3G, and

The launch of 5G services and the subsequent improvements will propel an expansion of USD 12.5 billion in the Indian telecom industry.

With a speed of 20 Gbps, the 5G network is poised to gradually increase the average data usage per subscriber.



IN BRIEF

- 5G technology offers high-speed Internet, boosting data consumption and revolutionising how people interact, work, and access information.
- Beyond 5G, the industry anticipates faster speeds, lower latency, and seamless integration of AI, virtual reality, data analytics, and blockchain technology.
- Innovations beyond 5G aim for lower energy consumption, reducing carbon emissions and connecting billions of devices.
- The launch of 5G services and the subsequent improvements will propel an expansion of USD 12.5 billion in the Indian telecom industry.

4G have effectively delivered most of those promises, primarily by offering faster data connectivity speeds. However, the adoption of 5G has influenced how people and professionals interact, work, and acquire information, revolutionising the future of telecom services. A Deloitte-Confederation of Indian Industry study projects that every three years, the launch of 5G services and the subsequent improvements will probably propel an expansion of USD 12.5 billion in the Indian telecom industry.

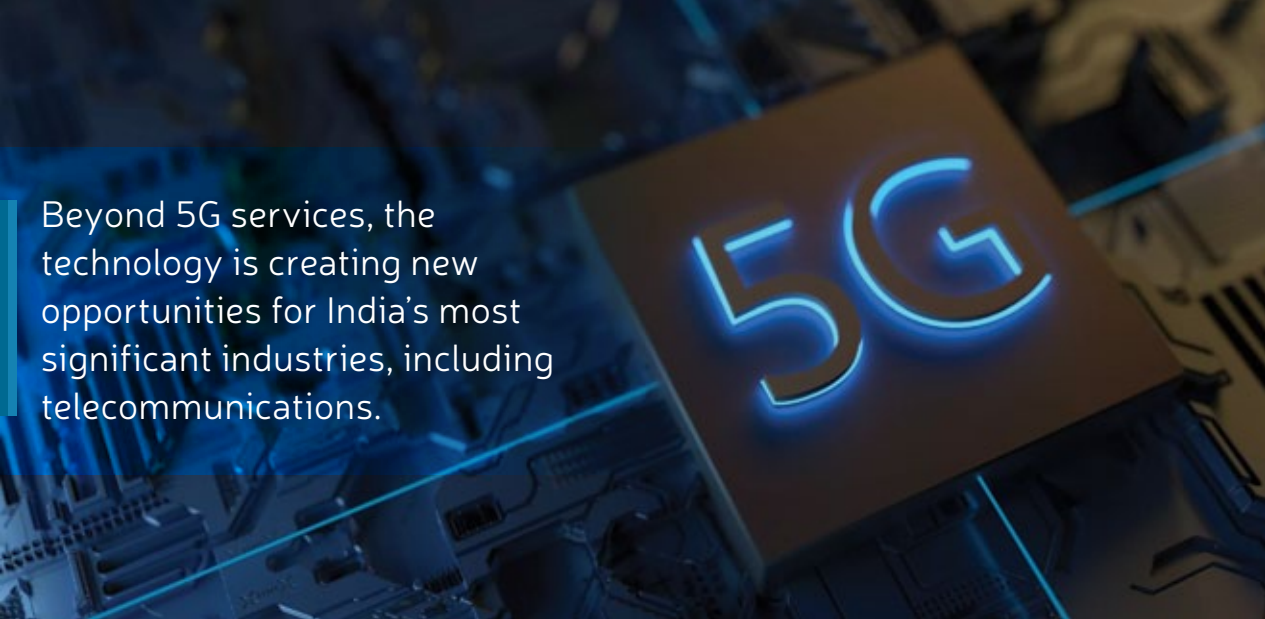
Therefore, considering the rapid pace of technological advancement and innovation, it is expected that the telecom industry will continue to experience significant growth in the coming years. This future may include technologies such as 6G networks and even more seamless integration of Artificial Intelligence (AI), the Internet of Things, and data analytics into our daily lives. With these advancements, we can expect even greater connectivity and enhanced virtual reality. So, before delving into the future of the telecom sector, let us dive into the details of 5G and its potential benefits.

THE 5G ADVANTAGE

There is no denying the fact that the rollout of the 5G network has been a game changer for the telecommunications industry, providing speedy downloads and uploads for every operation. Unlike its predecessor, this technology does not require specialised networks, since it is built for greater versatility, working simultaneously with a variety of other networks.

As a result of 5G's quicker Internet speed and more dependable network, users will be able to download easily and conveniently. With a speed of 20 Gbps, the 5G network is poised to gradually increase the average data usage per subscriber. The average data consumption per user has risen sharply since 2018, reaching 19.5 GB per user per month in 2022, the equivalent of 6600 songs, according to Nokia's annual Mobile Broadband Index (MBiI) report.

Even though 5G was only introduced a year ago, it has already caused significant disruption in the Indian market. Thus, technology has undoubtedly become the norm, and to experience a paradigm shift, astute leaders



Beyond 5G services, the technology is creating new opportunities for India's most significant industries, including telecommunications.

and professionals are already forecasting what the next stage of telecom services will hold beyond 5G.

SERVICES BEYOND 5G

The telecom industry is seeing a sharp rise in innovation when it comes to moving beyond 5G offerings. While 5G has made enormous headlines, as technology continues to advance at an astounding rate, experts are conceptualising 6G networks to stay ahead of the curve. Recently, the Indian government released the Bharat 6G Vision Document as a proactive step. The goal for the upcoming wave of wireless technology is to provide high-speed Internet, which is faster than 5G's maximum speed and would support economic growth in the Indian telecom sector.

Eventually, this next generation of telecom services will not only offer faster and more reliable connectivity but also enable advanced technologies such as AI, virtual reality, and data analytics. Additionally, the integration of blockchain technology is expected to enhance security and privacy in the telecom industry. Therefore, it is reasonable to say that, beyond 5G, we will be able to enjoy faster speeds with less latency than we have now.

Furthermore, the technologies will be able to facilitate quicker downloads, which will improve the user experience and change a lot of elements of users' lives. For instance, customers will be able to download large files quickly and watch high-definition videos without any issues with higher download speeds. This

will improve entertainment experiences while also making remote work and collaboration more effective and facilitating seamless access to cloud-based services and apps.

Moreover, transcending beyond 5G services, it is anticipated that the telecom industry is envisioned to witness lower energy consumption, promoting sustainability by reducing carbon emissions. When all is said and done, it will connect billions of devices and technological systems, fundamentally altering how people engage with the digital world.

Owing to these innovations and their significance, the future of telecom services beyond 5G seems promising. Thus, with the continuous advancements in technology, telecom services are expected to become even faster, more reliable, and more efficient. Ultimately, going beyond 5G services, the technology is creating new opportunities for India's most significant industries, including telecommunications, as well as bringing in a new era of quicker networks and improved network performance.

A Mordor Intelligence report indicates that the Indian telecom market is expected to grow at a CAGR of 9.40%, up from USD 44.43 billion in 2023 to USD 69.62 billion by 2028. 🌟

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Empowering India's future communication landscape

The telecom equipment and electronics market in India stands at a crucial juncture, requiring significant R&D investments to move forward



BY ANEEF TAS

In the heart of India's fast-growing electronics scene, there's a big opportunity. As the country's economy keeps getting stronger year after year, more and more people want electronics like smartphones and cool gadgets. This creates a great chance for companies to make and sell these products. We can see this happening with new businesses and brands popping up, showing off India's spirit of creativity and innovation.

The introduction of 5G technology has accelerated the pace of innovation and consumers' awareness of the latest technological advancements. To compete and stay relevant, brands must invest in research and development (R&D) to incorporate 5G capabilities and other cutting-edge features into their products. Indian consumers are well-connected globally and are increasingly tech-savvy. They have higher buying power

The launch of 5G services and the subsequent improvements will propel an expansion of USD 12.5 billion in the Indian telecom industry.

The telecom equipment manufacturing industry has the potential to generate more than 1.7 million jobs in India by 2025.



IN BRIEF

- **Communication revolution:** Rapid mobile data growth necessitates substantial R&D investment in 5G technology to ensure seamless connectivity for diverse consumers across India.
- **Networking excellence:** India's massive online user base demands innovative networking solutions, urging R&D efforts for efficient, widespread, and reliable Internet access.
- **Telecom self-reliance:** Indigenous telecom equipment production enhances self-reliance and generates significant job opportunities, aligning with India's global manufacturing aspirations.
- **Customised devices:** R&D investments enable manufacturers to customise electronics, ensuring products resonate with India's varied demographic.
- **Innovation fuel:** Strategic allocation of resources to R&D, approximately 10% of the budget, is vital for driving technological growth and innovation to foster a connected future.

and are willing to invest in products that make their lives more convenient and efficient. This places a premium on products with innovative features.

In a competitive market, simply launching a new product is not enough. To stand out and succeed, brands need to constantly evolve and differentiate themselves through innovation. This is where R&D comes into play. It can also help brands design products tailored to different age groups and specific needs in India.

COMMUNICATIONS: PAVING THE WAY FOR CONNECTIVITY

The importance of reliable communication cannot be overstated, especially in a vast and diverse country like India. The new 5G technology is a game-changer, promising super-fast Internet and connections, but there are big challenges. We need to invest in R&D to make the technology and systems that will bring 5G to all parts of the country.

To explain how urgent this is, think about how fast mobile data usage is growing in India. Consumer data consumption in India will grow at a CAGR of 16% between 2022 and 2028, moving up from 26GB (per user per month) recorded at the end of 2022. This means we need to spend a lot on R&D to make sure 5G can work well for all kinds of Indian consumers, whether they live in big cities or far-off villages.

NETWORKING: STRENGTHENING DIGITAL HIGHWAYS

Just as roads need maintenance, digital highways need continuous improvement to ensure the seamless flow of data. The surge in Internet usage, both for work



A strategic allocation of around 10% of the budget for R&D can significantly contribute to technological growth and innovation.

and leisure, requires innovative networking solutions. R&D is the key to creating efficient and cost-effective technologies that can adapt to the country's diverse topography and population density.

In 2021, India had approximately 624 million Internet users, making it the second-largest online market globally. This statistic emphasises the pressing need for R&D in networking solutions to ensure that these millions of users can access fast and reliable Internet services regardless of their location.

TELECOM EQUIPMENT: SELF-RELIANCE AND JOB CREATION

India's aspiration to become a global manufacturing hub hinges on the local production of telecom equipment. Currently, India relies on imports for some essential telecom equipment, which poses challenges to self-reliance. R&D can address this by enabling companies to design and manufacture telecom equipment that meets the unique demands of the Indian market.

Creating indigenous telecom equipment is not only a strategic move for self-reliance but also a significant job creator. A report by Invest India indicates that the telecom equipment manufacturing industry has the potential to generate more than 1.7 million jobs in India by 2025.

DEVICE MANUFACTURING: CUSTOMISATION FOR DIVERSE NEEDS

The Indian consumer base is incredibly diverse, with varying age groups, lifestyles, and needs. One of the

critical roles of R&D is to understand and cater to this diversity. By investing in research and development, manufacturers can create products that align with specific consumer requirements.

In 2020 a record 54.3 million smartphone units were shipped during the quarter with 17% year-on-year growth in the third quarter of the year. This growth underscores the importance of customisation through R&D to cater to the diverse and evolving needs of Indian consumers.

FUELING THE FUTURE

The electronics market in India stands at a crucial juncture, and R&D is the engine that can drive it forward. A strategic allocation of around 10% of the budget to R&D can significantly contribute to technological growth and innovation. It is not merely about creating products; it's about creating products that resonate with the diverse and dynamic Indian consumer base.

To summarise, the need for greater investment in R&D in India's electronics industry is backed by facts and figures. The statistics tell a compelling story of growth, opportunity, and the pressing need for innovation. It's a call to action for electronics brands to invest in research and development, paving the way for a brighter and more connected future for India's electronics sector. 🌟

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Skulls, crossbones and QR codes

From the second man to the second-story man, QR codes have moved from being a thing of convenience to a sneaky window for cybercriminals to tap

BY PRATIMA HARIGUNANI



From the days when black pepper was transported through the sea to the nano-seconds when money moves in the form of bits and bytes via fibre optics- one person has continued to haunt merchants in ever-evolving ways. The pirate. The way they look may have changed but pirates still shadow every penny they can rob or steal.

It was just a matter of time till they came for QR codes. The upper storey that we built after bar codes, and cemented during the pandemic for faster and contactless commerce, has now caught the patched eyes of these burglars. It is the storey that was meant for speed, convenience and easy access. It is, now, the storey that is being used by burglars to sneak into the building we carry in our pockets. Our devices. And data.

WHAT DO THEY LOOK LIKE?

Quishing is now as common and as dangerous as phishing or vishing. Yes, QR Code threats are on the rise. They come in the form of masquerades that lead the user to malicious sites or download malware on the device. The result can range from pennies slipped out to pounds cut away from one's pocket, from the user being subscribed to a marketing list and newsletter without consent to stealing sensitive information from devices or spying through the device. The most serious blow is, of course, the theft of the credit card or bank information of the user and the downloading of malware on the device. It can also lead to the hijacking of devices for misuse.

Harshil Doshi, Country Director, Securonix avers that QR codes have become commonplace in our lives and with it, the related scams are also rising. "Attackers are using various techniques to alter QR codes on business websites and scam unsuspecting users. After scanning these codes, the user is directed to a malicious website that asks them for their credentials or

a malicious application which typically contains viruses or other malware. Knowing how the digital landscape is fast evolving, these scams are only going to become more sophisticated."

Vivek Srivastava, Country Sales Leader, Fortinet India zooms in on the unique aspect of QR code scams which, he explains, lies in their ability to serve the same malicious intent as other cyber-attack vectors, such as phishing emails.

"Cybercriminals employ QR codes to infiltrate malware onto users' devices with the ultimate goal of pilfering user credentials and passwords. In our daily routine, we are constantly using the Internet and various applications, entering our usernames and passwords across numerous online platforms, including e-commerce, work-related tasks, bill payments, social networking, and entertainment streaming," he says.

This practice comes with inherent risks. In case any of these platforms become compromised, the stolen username and password information typically ends up on the dark web, where it is offered for sale. This data can be incredibly valuable to cybercriminals, especially when it can be reused on high-value targets like financial institutions or online shopping websites, resulting in potential financial loss for the individual.

Nader Henein, VP Analyst, Gartner points out other facets. The scam is not targeted at a specific individual, when you scan a QR code for an offer for pots and pans, and you land on a site with pictures of pots and pans, you are more likely to share your data thinking this is the correct site. "People have an implicit level of trust towards QR codes that are not earned and it can easily be manipulated. This compromise builds on authentic offers which have authentic campaigns behind them."



"QR scams have the potential to damage a merchant's reputation, erode customer trust, and deter users from engaging in online transactions."

Vivek Srivastava

Country Sales Leader, Fortinet India



“QR codes posted in public or provided through untrusted channels could be easily manipulated to send the user to a compromised site.”

Nader Henein
VP Analyst, Gartner



IN BRIEF

- **Rising threat:** QR code scams are escalating in India, jeopardising users and merchants, and causing financial losses and reputational damage.
- **Scam variants:** Scammers utilise tactics like quishing, leading users to malicious sites, stealing data, or redirecting them to phishing websites.
- **Financial impact:** The QR code payment market's rapid growth (projected to reach USD 55.60 billion by 2033) emphasises the urgency to combat such scams.
- **User vigilance:** Users must avoid scanning QR codes from untrusted sources, verify recipient details, and refrain from sharing sensitive information.
- **Collective effort:** Combating QR code scams necessitates a collaborative effort involving users, industry stakeholders, policymakers, and regulatory bodies.
- **Business responsibility:** Companies should deploy robust cybersecurity solutions, educate users on recognising malicious content, and collaborate with regulatory bodies to establish a safer digital environment.

In an illustrative instance, FortiGuard Labs identified a phishing campaign earlier this year, which utilised diverse QR codes to target Chinese-speaking users, cites Srivastava. “A document was attached to this campaign, featuring a prominent QR code at its centre. Upon scanning this QR code with their desktop or mobile devices, users were redirected to a website controlled by threat actors. The primary objective of this QR code scam was to deceive users into disclosing their credentials on a phishing website operated by the malicious actor.”

HOW MUCH THEY HURT?

There is a reason the bad guy is chasing this door. According to Future Market Insights, the QR code payment market could surpass USD 11.67 billion in 2023 and move up to USD 55.60 billion by 2033. The Bitly 2023 QR Code Trends Report confirms that QR Codes are being used by businesses and brands at an accelerated pace with global creations up 41% compared to 2022.

Notably enough, The Retail and Consumer Packaged Goods (CPG) industries experienced an 88% jump in QR Code creation in 2023. This is echoed in a December 2022 survey report from Pymnts, wherein many retailers believe that tech-enabled in-store features determine loyalty, with 81% pointing at the ability to use QR code scanner apps



“Apart from exercising user caution, e-commerce websites should deploy robust cybersecurity solutions which can detect fraudulent activities.”

Harshil Doshi

Country Director, Securonix

to check prices and inventory, and 51% highlighting self-service kiosks.

That pushes us to confront the bigger fear. Apart from harming the users, the ripple effect of these scams can be massive. They can jeopardise merchants and the digital commerce ecosystem. A landscape that is in full blossom now in India with Unified Payments Interface (UPI), Open Network for Digital Commerce (ONDC), digital currencies and other fast-growing digital interfaces.

Srivastava affirms that QR code scams present a significant threat to merchants and the digital commerce ecosystem. “These scams can result in substantial financial losses, affecting both merchants and their customers through fraudulent transactions and chargebacks. Furthermore, they have the potential to damage a merchant’s reputation, erode customer trust, and deter users from engaging in online transactions. Regulatory consequences may also come into play, as lax security practices can lead to fines and legal issues. Additionally, these scams can disrupt operations as resources are redirected to address security breaches and compensate affected customers.”

In India’s dynamic digital transaction landscape, there has been a concerning upswing in QR code scams, Maheswaran S, Country Manager – South Asia, Varonis also puts forth. “Recent reports indicate a notable surge in such incidents over the past couple of months, with hundreds of cases reported across the country. Furthermore, an extensive study revealed that from 2017 till 31 May 2023, Bengaluru alone witnessed approximately 20,662 cases, accounting for 41% of total cases related to QR codes, malicious links, and debit or credit card frauds.”

As Henein dissects, this attack weakens the impact of a merchant’s campaign because potential prospects are being redirected to the attacker’s site and once the attack

is discovered by the individual, there is a residual distrust that has a market-wide impact. “The victim is not likely to share their data with any such campaign thereafter.”

HOW TO BE BEAT THE PIRATES?

When you are on a ship, the best way to fight pirates is to have someone on the deck watching for them all the time. One has no choice but to be extra alert and equipped and not careless or lazy.

The same formula applies to digital oceans too.

Doshi suggests that to avoid QR code scams, users have to be more alert and wary of their online transactions. “Some useful tips come in handy in these times. Never share your bank account details or UPI ID. Never scan any QR code to receive money. QR codes do the opposite. It is used for sending money. Also, while scanning any QR code, always check the details like the recipient’s name, account number or IFSC code. There are also apps available today which can detect fraudulent websites and QR codes. Never share your OTP with anyone. Also, try not to share your mobile number when not needed.”

Individuals should not use QR codes posted in public or provided through untrusted channels, reminds Henein. “They could be easily manipulated to send the user to a compromised site where their data could be stolen or where they could be exposed to malware. If an individual wants to avail themselves of an offer, they are better off ‘Googling it’ and the nature of search engine optimisation makes it highly unlikely that the attacker’s site will be featured on the first few pages of the search results.

Regardless of the attacker’s motivations, users are strongly advised to exercise caution in their online activities, Srivastava recommends. “This includes verifying the authenticity of received emails, refraining from opening suspicious attachments or links and



“Combating QR code scams is a collective effort. Users, industry stakeholders, and regulatory bodies must collaborate to establish a safer digital environment.”

Maheswaran S

Country Manager – South Asia, Varonis



WHERE THEY POP, AND HOW?

- Disguised as legitimate codes
- Marketing offers in public places like cafes, retail stores
- Duplicate code pasted over a genuine one
- Parking tickets
- Flyers and stickers in malls
- Contactless menu tweaked by threat actors
- Tempting and free Wi-Fi network offers

abstaining from entering their credentials on unfamiliar websites. When dealing with QR codes, it is imperative to authenticate the source and legitimacy of the sender's credentials before scanning the code. Instead of clicking on received links, users should navigate directly to the official website of the vendor for any transactions. Additionally, users can employ the practice of hovering over links to identify any unusual or suspicious URLs.

To counter this evolving threat, it is of utmost importance to prioritise public awareness and education, underlines Maheswaran. “Initiatives aimed at educating citizens on secure QR code practices and the necessity of source verification before scanning are crucial. Additionally, the development of robust cybersecurity measures, such as two-factor authentication and secure payment applications, is essential to safeguard users. Policymakers should contemplate regulatory interventions to deter scammers and ensure accountability.

Apart from exercising user caution, businesses like OLX or other e-commerce websites where most of these scams are happening should deploy robust cybersecurity solutions which can detect fraudulent activities, Doshi stresses.

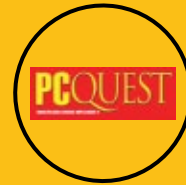
Organisations should also take the initiative to educate their users on recognising and avoiding malicious email attachments and links, as this awareness is a critical defence against QR code scams and other cyber threats, insists Srivastava.

Combating QR code scams is a collective effort, as Maheswaran S sums up well. “Users, industry stakeholders, and regulatory bodies have to collaborate to establish a safer digital environment for all citizens.”

It will take time and many steps. One sparrow does not make a summer. Well, notwithstanding a Jack Sparrow. 🦉

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Sky wars: India's satellite spectrum battle heats up

While Airtel and R-Jio are gearing up to launch satellite Internet services in India, the country's satellite spectrum allocation saga is far from over



BY VERNIKA AWAL

On 27 October 2023, standing at the keynote stage of the India Mobile Congress in Delhi, Sunil Bharti Mittal, chairman of Airtel's parent firm Bharti Enterprises, made an announcement that wasn't entirely expected. "By next month, we will be launching OneWeb's satellite Internet services," Mittal said.

Airtel, though, was beaten to the stand by cross-industry rival, Reliance Industries' Jio Infocomm. Earlier on the same day, Jio chairman, Akash Ambani, announced the launch of JioSpaceFiber, which would offer the same satellite-based Internet services that OneWeb promised.

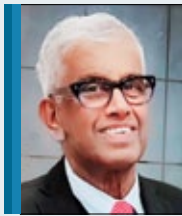
While the announcements were potentially headlining, a few eyebrows were raised as India continues to deal with the bottleneck of how satellite spectrum would be made available to its customers. How, then, did the two telecom operators, which account for nearly 81% of all Indian

network connectivity customers as per the Telecom Regulatory Authority of India (TRAI)'s July 2023 report, announce a service that technically cannot be provided in the country?

THE STORY SO FAR

Satellite Internet, or satellite connectivity, isn't exactly new. In at least limited capacities and forms, it has been present in India and around the world for a while. But things have largely flown under the radar, for the lack of a better pun.

In fact, for the longest time, access to connectivity powered by satellites was very limited. Not only was satellite access tightly regulated, it was also prohibitively expensive for most entities. As a result, barring sectors such as government affairs, defence communications and other such niche use cases, satellite services were largely unavailable and unseen to the average consumer. Also, for



“Satellite spectrum is more akin to shared common resources like air, water, and roads and it is unfeasible and impractical to consider auctioning it.”

TV Ramachandran

President, Broadband India Forum

the longest time, the only touch point for the average Indian consumer to use satellite Internet was through in-flight Internet connectivity on a few international air routes.

All of this changed in August 2021, when the domestic space economy was liberalised. Satellite services were opened up for usage by the private sector, which had a two-part effect: companies could soon be satellite operation providers as well as satellite service users. This led to a spurt in space startups, with satellite services at the centre of it all.

However, even as the sector has been liberalised, there are plenty of challenges ahead, the biggest of which was on how private entities would get access to satellite spectrum. Given that connectivity is a government-regulated subject, the Centre needed to decide this.

Over multiple rounds of consultations by TRAI, and legal inputs on the matter by telcos and enterprises, the industry awaits a decision on how satellite spectrum will be accessed.

WHY THE DEBATE?

Typically, spectrum for terrestrial connectivity is auctioned to telecom operators by the government. Companies pick up airwaves depending on their requirement and make bulk payments to the government, often, over a certain period. This time, however, non-telecom operator companies proposed that satellite spectrum could be offered directly to enterprises, and in an allocation format that many in the industry said was the norm for when shared spectrum is involved.

In terrestrial connectivity, when the Centre auctions airwaves to telecom operators, the winning bidders get exclusive access to the spectrum in concern. Subject to the payment of spectrum usage charges, and related levies and fees, the telecom operator who won the bid for the respective spectrum would have exclusive rights of usage.

For the supplementary satellite connectivity in question here, usage of satellite Internet services would be driven by shared spectrum usage. This is done to optimise the usage of airwaves and help operators offer services despite the crowded connectivity spectrum.

This, many industry stakeholders and veterans say, is a precedent that India should follow to ensure that the same auction model that is applicable for terrestrial networks is not used for satellite spectrum.

In a Voice&Data column published in March 2023, TV Ramachandran, President, Broadband India Forum pointed out that nowhere in the world is satellite spectrum auctioned. He also shared several reasons for that. “Satellite spectrum is a shared resource unlike terrestrial mobile spectrum which can be partitioned into small or large chunks that can be exclusively allotted to particular users and therefore the latter can be auctioned,” he said.

Ramachandran further added that in the case of satellites, the entire band is used by all operators in different slots. If the band is partitioned to enable sharing, there would be a major drop in spectrum efficiencies and utilisation, which is unacceptable. He also highlighted that the satellite spectrum is more akin to shared common resources like air, water, roads, etc. and it is unfeasible and impractical to consider auctioning it.

Opinions, however, differ based on which side of the fence you are on. Both Bharti Airtel and Reliance Jio have individually submitted legal representations to the Department of Telecommunications (DoT), claiming to explain why they feel that any mode of derivation of spectrum, apart from an auction, could be “unconstitutional”. In Jio’s representation to the DoT, former Supreme Court judge L Nageswara Rao wrote that “natural resource allocation must only be by auction.”

The Centre, on this note, has so far held steadfast that TRAI’s ruling will be tantamount. Speaking with

The initial cost of the satellite-based service is likely to be higher than terrestrial network service, posing a challenge for mass adoption.

journalists on the sidelines of the India Mobile Congress, Union IT minister Ashwini Vaishnaw said that the issue is progressing at a steady pace but refused to offer a timeline by stating that the IT ministry does not want to put undue pressure on TRAI's natural decision-making process.

STRING OF CHALLENGES

The first and foremost issue to this entire saga is the retirement of the TRAI Chairman, PD Vaghela, end of September. With a new TRAI chairperson due for appointment, who will become the authorised signatory for the spectrum allocation, the current roadblock is a systemic one which will only see resolution in due course of time.

Beyond that, other roadblocks include rationalising one faction of the industry, versus the other. The Centre does not want to antagonise enterprises in their quest to procure satellite spectrum, but telcos are still the mainstay for procuring spectrum and translating them into taxable, monetisable services across multiple sectors pan India. Yet, the Centre would have taken cognisance of the topic, and the notion that there have been ample lobbying for spectrum auction by telcos, instead of administrative allocation.

Apart from this, a key roadblock lies in the very core nature of the satellite spectrum, and its use cases. At present, satellite spectrum is not a consumer-facing offering, and will largely be used as backhaul for terrestrial networks, as well as in powering enterprise use cases such as in aviation and maritime communication. On this note, telecom operators will see initial limitations in proliferating the service to consumers. This is where the latest launches from Airtel and Jio come in.

With the new services, the two telcos will offer the satellite-based network service as an add-on or standalone service. However, the initial cost of the satellite-based service is likely to be higher than any other terrestrial network service presently available in the country. This could pose a challenge for mass adoption.

Further, satellite spectrum wasn't ever meant to be a mass-market solution, and even going forward, will largely play a role in filling gaps in terrestrial solutions

where the latter is weak. This, in turn, automatically reduces the reach of serviceable areas within satellite networks, making them a potentially limited offering.

TERTIARY PRESSURES

Amid all this, Elon Musk, known for helming electric mobility startup Tesla and space startup SpaceX, two of the most successful so far in their respective industries, created an entity named 'Starlink'. In May 2019, the latter started launching small satellites that would reside in an orbit that is considerably closer to the Earth, thereby called Low Earth Orbit (LEO). Musk's vision was to create a constellation or chain of satellites that would work in relay, and cover the entire world in a web of Internet connectivity.

While this, in ways, boosted the hype around space satellite offerings, Starlink has already received regulatory clearance to offer its services in India. Media reports also indicate that Jeff Bezos and Amazon-backed satellite Internet service, Project Kuiper, has also recently applied for a regulatory satcom licence in India, and could launch its services as early as the end of next year.

This is not all. While enterprises are slated to become the primary customers for satellite Internet services, tech and networking expenditures by companies across verticals have steadily declined, as the September quarter's IT earnings showed. This suggests that if tech spending remains low, most initial deployments of satellite Internet services could be pilots or early-stage expressions of interest at best. Large, multi-million-dollar deployments, in this regard, could be deferred for the upcoming quarters, which means that even if spectrum auction or allocation clearance is given by the end of this year, adoption of the service could remain limited.

With limited initial market scope, plenty of competition, high costs, and stuttered confusion regarding spectrum auction or allocation at hand, India's efforts to liberalise and open up satellite connectivity for all are seeing a shaky start at best. While companies remain bullish on a potentially large market size, none of the challenges are frivolous, and definitely cannot be overcome in a blink. 🌩️

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Why is India talking about net neutrality again?

Talks from telcos for higher pricing of data for the most popular Internet services mean that the net neutrality debate is back



BY VERNIKA AWAL

In September, telecom operators wrote to the Department of Telecommunications (DoT), urging it to reconsider the pricing of data packets to rightly account for the amount of data consumed by over-the-top (OTT) Internet-based services. Their rationale was based on OTT services consuming more

data, thereby having a lopsided impact on the overall operating expenditures incurred by these telcos.

What the telcos did not expect to see here was a partial resumption of the entire net neutrality conversation in the country. After having closed it off following the landmark

“The TSP’s rights over the network created by them need to be restored in a manner in which Big Tech protects its intellectual property rights.

Reliance Jio

“Large traffic originators must contribute a fair share through a direct contribution to telecom service providers.

Bharti Airtel

debate that involved Facebook (now Meta), net neutrality is a subject that has so far not seen turmoil. Until now, that is.

WHAT DO TELCOS WANT?

On July 7, the Telecom Regulatory Authority of India (TRAI) released a consultation paper for industry responses, titled 'Regulatory Mechanism for Over-The-Top (OTT) Communication Services, and Selective Banning of OTT Services'. Multiple parties and entities raised responses to TRAI's consultation, which was published by the regulatory body on September 5.

The most scathing of the lot came from Bharti Airtel, Reliance Jio and Vodafone Idea—the three main telecom operators of India. Airtel's representation to TRAI, which sums up the crux of all three operators in one, said, "Given the large requirements for meeting the vision of digital India, large traffic originators that account for a disproportionate amount of these (network infrastructure) investments must contribute a fair share. This should be through a direct contribution to TSPs (telecom service providers)."

The surcharge that telcos want companies to be charged, as per the submissions, could be "their share of contribution to the capital cost of broadband networks. This may be computed basis of traffic, revenue, number of consumers or some other parameter that should be decided soon."

Each of the three telecom operators chose to hide behind the garb of "fair share" in telecom charges, with Airtel and Vodafone going so far as to claim that if a selection criterion such as a service having at least 5 million concurrent active users, or accounting for at least 5% of all broadband traffic at peak traffic from that platform, is achieved, only then should this supposed surcharge be levied. In other words, implementing such a strategy, as per the telcos, would not affect all companies.

Airtel's submission claims that such a plan will "protect innovation and allow smaller OTTs to thrive and compete." Jio further likens its claim on network fees to Netflix restricting account sharing on its platform. "The TSP's property rights over the network created by them need to be restored in a manner in which Big Tech protects its intellectual property rights—for instance, Netflix restricting account sharing or password sharing."

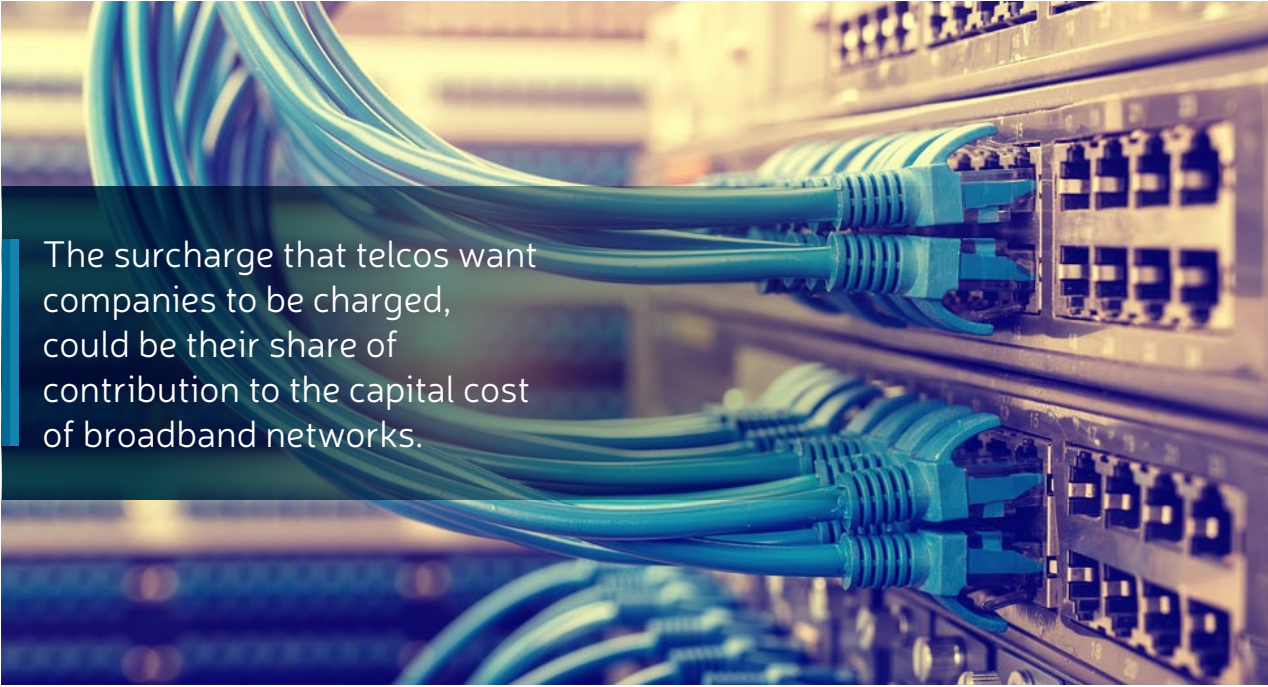
It is this consultation paper, and its responses, that led to the renewal of the net neutrality debate in the country—seven years after it had first raised huge public outrage towards India's prominent telecom operators.

NOT THE FIRST TIME

This, though, is not a first for India. The landmark 2016 battle for net neutrality resonates with how the telcos' presentation escalated the topic into the limelight out of nowhere. Back then too, operators ultimately attempted to promote unfair pricing or usage tactics. Users would have either had to pay more to access a popular service or bundle themselves into a company's plans entirely to pay less.

TRAI, in its landmark 2016 verdict that has so far defined net neutrality in India, noted that discriminatory pricing of services would not be permitted under the law of the land, thereby pushing back the telcos' efforts towards a multi-billion-dollar monetisation avenue.

In 2018, the Ministry of Communications hard-coded net neutrality as a clause into the unified licence that telecom operators obtain to provide telecom services in the country. This means that telcos cannot go behind the scenes and order a private firm to pay them separate fees to be treated the same as any other service. In other words, in India, telcos cannot coerce companies, websites and apps into extra money, or threaten them with slower connectivity.



The surcharge that telcos want companies to be charged, could be their share of contribution to the capital cost of broadband networks.

WHAT HAPPENS NEXT?

The Centre has so far held steadfast that no discussions to revisit net neutrality clauses have been entertained as yet. Media reports indicate that the government will likely remove any clause or mention of OTT platforms from the upcoming new Telecom Bill, to reduce confusion between them and traditional broadcasters or telephony service providers.

On 29 September 2023, the Union Minister of State for IT, Rajeev Chandrasekhar, noted during a media briefing that the battle for net neutrality against telcos was “a hard-fought one”, and recalled his involvement in writing to TRAI to retain consumer rights. Chandrasekhar’s statement came around a letter signed by notable figures from India’s startup community, such as Paytm founder Vijay Shekhar Sharma, Razorpay chief Harshil Mathur, and Zerodha cofounder Nithin Kamath, as well as 125 others, who wrote to TRAI urging them to retain confidence in favour of net neutrality.

Media reports quoting government officials point out that the Centre presently has no plan to go back on its stance towards net neutrality, to protect consumer interest to the fullest.

The battle, though, is not over. While TRAI presently awaits its appointment of a new chairperson, industry

bodies, such as the Cellular Operators’ Association of India (COAI), are continuing to push in favour of the telcos. Reports also indicate that COAI has urged the TRAI not to entertain letters written to them in favour of net neutrality.

THE IMPACT ON USERS

Simply put, if the telcos were to win, companies would be left without any protection from what would essentially be arbitrary pricing claims from telcos. This could either lead to disruption in services or a levy of additional fees by companies such as Netflix or WhatsApp from the users for accessing the services. This could make such services more expensive and also give telecom operators a lopsided amount of power to control the flow of information.

Telcos, on their part, cannot conclusively argue that their development of network infrastructure would be any different if the said OTT services were not present. Industry stakeholders, on this note, believe that telcos do not have a compelling case backing up their “fair usage” claims this time either—leaving consumers to potentially retain a second victory in net neutrality this time as well. 🍷

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Sanjeev Chhabra

Managing Director and CEO
Beetel Teletech

“Beetel can execute larger SD-WAN turnkey projects”

Beetel is a name we have known since the good old landline days. It was founded in 1987 and became one of India's leading home-grown brands and an established market leader in the landline phone category. Fast forward to the present, and the company is excited about its new journey as a pioneer in IT enterprise and networking solutions, SD-WAN, and collaboration solutions. Sanjeev Chhabra, Managing Director and CEO, Beetel Teletech in an interview with Pratima Harigunani provides a closer look at the pendulum's big swing – from landlines to the software-defined networking world.

Tell us about the current strategy and portfolio of Beetel in India.

At Beetel, we follow a two-fold strategy. The first revolves around strengthening our partner base, enabling them to provide innovative solutions, and managing their customer relationships by establishing deep partnerships with OEMs and strategic accounts. Beetel ensures that its partners have a clear understanding of its product offerings, empowering them to address complex customer challenges. This includes emphasising, but not limiting, the development of MSI as a segment and software, security, and services as categories.

Next, Beetel is expanding and strengthening its project and services arm, with a special focus on its strategic accounts. We have established a PMO and governance layer consisting of technical and commercial representatives. Beetel is committed to providing 360-degree support, from pre-sales to post-sales, and proof of concepts.

How vast is your footprint today?

With our comprehensive network comprising 1,500+ channel partners – the system integrators, 10,000+ retailers, and 500+ distributors spanning 400+ cities in India and several cities globally, we have been able to bolster our presence and serve technology that not only connects businesses but also people together.

How strong is your enterprise segment?

We take pride in our commitment to transforming boardrooms into centres of efficient and seamless collaboration. Our offerings are designed in such a way that they ensure business communications are not just reliable but also technologically advanced. Whether it is conducting important meetings, presentations, or team discussions, Beetel's solutions are there to support our customers every step of the way.

“We take pride in our commitment to transforming boardrooms into centres of efficient and seamless collaboration.”

By promoting R&D, and encouraging local manufacturing, the Government of India is creating an environment that is conducive to innovation and competition.

Our mission is to help organisations do more in their business, and thus, we have formed alliances with top-rated brands such as Arista, Avaya, Derwiser, E42 AI, Poly, HPI, and Samsung to name a few, owing to their mastery of different enterprise solutions be it data centre networking products, unified communications solutions, cabling solutions, end to end automation through AI, audio and video conferencing solutions, large format displays and digital signage.

What is happening in the SD-WAN space? What is the company doing on this front?

Beetel represents over half a dozen brands and their SD-WAN solutions in India, supported by Beetel's technical team with the capability to successfully install and commission customer sites in India. With this capability, Beetel is ready to take the lead in the market and execute larger SD-WAN turnkey projects.

How has the drive for indigenisation or 'Make in India' impacted the industry?

The Make in India initiative has had a significant impact on the telecom and electronic manufacturing industry in India. By increasing investment, promoting R&D, and encouraging local manufacturing, the Government of India is creating an environment that is conducive to innovation and competition. This is already leading to the development of new products and technologies and the improvement of the quality and affordability of existing products.

The initiative has emerged as a win-win for both consumers and manufacturers. While the consumers have benefited from lower prices and a wider range of products to choose from, Manufacturers have benefited from a large and growing market and the government's support for the sector.

How tough or easy was indigenisation for you back then, as a pioneer?

As an organisation, Beetel is always recognised for its consistency, quality, innovation, and ability to deliver exceptional value to both our partners and their

customers in the field of manufacturing. We consistently maintain our customers' preferences by continuously evolving to meet the demands of this competitive market and ensuring sustainable growth for all our stakeholders. This has been a long journey, never an easy one. With our joint venture, we are now actively participating and becoming more aggressive over time to achieve a higher level of excellence to support the Make in India initiative in a big way.

So, what is the next exciting area that Beetel is focusing on?

India stands out as a prominent player in the global IT landscape, owing its significance to a compelling blend of factors that establish it as an IT hub. This enhances the appeal of the overall market, given India's consistently advancing IT infrastructure, featuring a robust digital ecosystem, extensive connectivity, and world-class data centres. The government's initiatives, such as the Production-Linked Incentive scheme to bolster domestic manufacturing or Make in India, have further contributed to India's allure.

In summary, India's amalgamation of skilled talent, cutting-edge infrastructure, cost-effectiveness, innovation, advantageous time zones, and a proven track record firmly cements its status as the guiding star in the realm of global IT requirements.

And what does all this translate into for the company?

We are eagerly anticipating the next couple of years, which promise to open a floodgate of opportunities for us. As mentioned earlier, we are proactively preparing Beetel for the future by venturing into emerging technologies like industry software, Artificial Intelligence, Machine Learning, and security solutions. Furthermore, we are expanding into projects and services, reinforced by a pool of talented individuals and a robust governance framework. 🌟

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[INTERVIEW]

DRONES



Yerramreddy Nivesh Reddy
Founder and CEO, Mydhili Aerospace



“Drones need the right apps to take off”

A company committed to manufacturing locally, Mydhili Aerospace is a good example of innovation brewing strongly in the young minds in India. While the company specialises in manufacturing drones for agricultural and delivery purposes, it aims to get a step ahead and also produce all components that go into the making of a drone locally, without relying on imported raw materials or parts.

*The company's Founder and CEO **Yerramreddy Nivesh Reddy**, in an interaction with **Pratima Harigunani**, shared how Mydhili came into existence, the distance it has covered and where it heading. He also talked about what spurs and what stops this segment's trajectory. Excerpts from the interaction:*

What triggered the idea behind Mydhili Aerospace? How difficult or easy was it to get where you are today?

My journey into this business began in my 11th class when I developed a keen interest in entrepreneurship. Initially,

I envisioned selling agricultural drones, but extensive research led me to pivot towards manufacturing drone frames. This shift was driven by the high demand and a desire to reduce India's dependence on Chinese drone components. The path was challenging, particularly due to limited capital from bootstrapping and difficulties in prototyping, especially with 3D printing. As pioneers in India's drone frame manufacturing, we lacked high-end equipment initially. Looking ahead, our focus is on growth and innovation in the drone frame industry.

What progress areas are you most excited about?

One of our achievements includes the successful delivery of a drone with a payload capacity of 15 kg. While we encountered challenges during our initial order, we used these experiences to gain insights and effectively overcome obstacles. Our first drone model, named BARISH AD-01, has been completed, and we are currently developing the second drone frame, BARISH AD-02, which boasts enhanced specifications surpassing those currently available in the market.

“Balancing security, safety, and surveillance concerns is a priority, and we are committed to adhering to stringent standards for responsible drone usage.”

The Make-in-India initiative provided a catalyst by encouraging domestic production, a positive force driving Mydhili to contribute to this vision.

What is so special about BarishAD-1?

Breaking new ground in drone manufacturing, BarishAD-1 is designed as a hexacopter, a configuration widely recognised for its exceptional flight stability, especially suited for agricultural and delivery applications. What truly sets BarishAD-1 apart is its impressive weight-to-lifting capacity ratio. Weighing in at just 16 kg, this drone boasts an impressive lifting capacity of 25 kg, a testament to its cutting-edge engineering.

The drone's canopy has been meticulously crafted to optimise aerodynamic flow, ensuring enhanced endurance and performance. Its payload holder, designed with a sleek and streamlined airflow structure, adds to its efficiency. At the heart of our agriculture and delivery drone lies a sophisticated array of electrical components, including a navigation system, GPS, multiple sensors, high-quality cameras, programmable controllers and tools to facilitate autonomous flight. It opens doors for farmers seeking advanced agricultural practices, engineers engaged in surveillance activities and product shipping companies looking for innovative delivery solutions.

What sets your drones apart?

Our drone frames stand out due to their durability, ease of maintenance, and cost-effectiveness. We prioritise high-quality materials and design for longevity, making them rugged. Simplicity in maintenance ensures that users can easily keep them in top condition. The total cost of ownership is reduced, making our frames an economical choice for drone enthusiasts.

Can you share some details on the emphasis on indigenisation and the challenges you may have encountered there – or any boost from the Make-in-India impetus?

Indigenisation has been a central theme in our journey. We aimed to reduce reliance on foreign components and promote local manufacturing. However, this posed challenges, mainly related to capital constraints and prototyping difficulties. The Make-in-India initiative

provided a catalyst by encouraging domestic production. It's been a positive force driving us to contribute to this vision.

What role do indigenisation and 3D printing play in terms of costs, environmental impact, G2M speed, testing edge and so on?

Indigenisation and 3D printing have critical roles. They reduce costs by avoiding import expenses and also in prototyping, minimise environmental impact by promoting local manufacturing, accelerate Go-to-Market speed, and offer testing advantages. These factors combine to enhance the overall competitiveness of our products.

Do we lack the right equipment or the right applications, when it comes to drones in India?

In India, there's a need for more advanced drone equipment and applications. While strides have been made, further development in areas like agriculture, surveillance and disaster response can unlock the full potential of drone technology.

What kind of clarity or regulatory support can be helpful for players like you – and how can you balance security, safety, and surveillance concerns?

Regulatory clarity and support are essential for our industry. Clear guidelines and streamlined approvals can foster innovation. Balancing security, safety and surveillance concerns is a priority, and we are committed to adhering to stringent standards to ensure responsible drone usage.

What next?

We are excited about the future of our drone frame manufacturing business and the broader spacetechnology sector in India. We are dedicated to contributing to indigenous production, innovation and responsible use of technology. 🌱

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