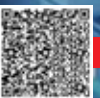


GROWING BEYOND TRADITIONAL HUBS

As the demand for data localisation rises and India's digital user base grows in volume, datacentre firms are eyeing cities beyond the metro hubs





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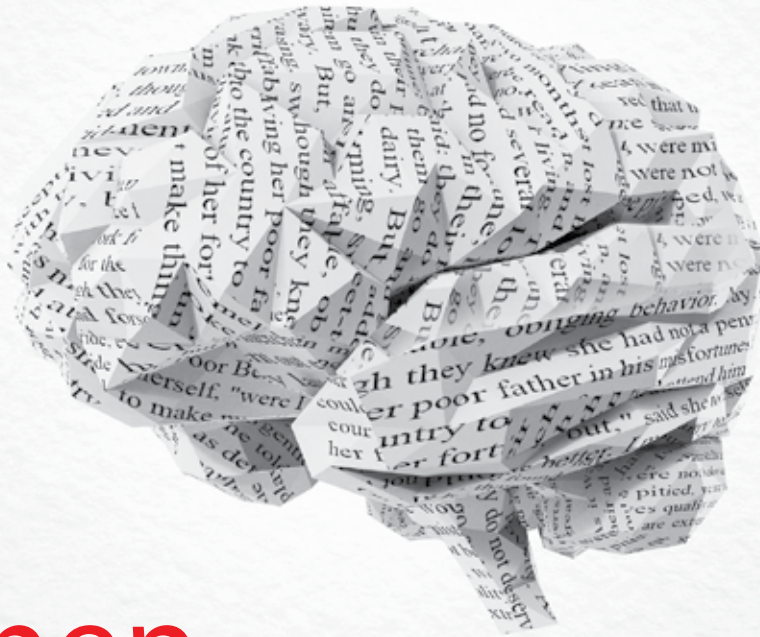
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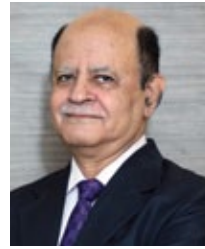
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SHUBHENDU
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[OPENING NOTE]

Set ground rules for brain-to-device communications

In the ever-evolving landscape of cutting-edge communication technologies, we continually marvel at their incredible ability to connect devices and people across vast distances. But as we look ahead, researchers and scientists are working diligently to perfect interfaces for an even more astonishing endeavour – connecting minds to machines.

So, what exactly does this entail?

With Neuroengineering at its core, doctors and researchers are now seeking to restore communication between the brain and the body, bridging the gap created by debilitating conditions such as spinal cord injuries, strokes, and neurodegenerative diseases. A recent breakthrough in this field is nothing short of remarkable, offering a glimmer of hope to those who have longed for restored mobility and independence.

Just for the background: A diving accident in 2020 had led to a broken neck at the C4 and C5 vertebrae leaving 45-year-old Keith Thomas completely paralysed and unable to move or feel any of his limbs.

Early in March this year, surgeons at Northwell Health's Feinstein Institutes for Medical Research successfully implanted five microchips into Thomas' brain. Led by Prof Chad Bouton of Northwell's Institute of Bioelectronic Medicine, this first-of-its-kind clinical trial included a combination of AI algorithms, brain-computer interface (BCI) implants, external computers, and non-invasive wearable tech.

To make this happen, bioelectronic medicine researchers, engineers and surgeons conducted a "double neural bypass" to set up an electronic bridge – the microchips and electrodes – enabling the interception and rerouting of neural signals, allowing Thomas to regain not only movement but also the sensation in his arm and hand.

In simple terms, the implanted microchips decode bioelectrical messages, which are then transmitted to a computer. The computer, in turn, sends electric signals to a series of electrode-laden patches strategically placed across Thomas' spine and forearms. The final touch comprises minuscule sensors placed on his fingertips and palms, meticulously relaying touch and pressure data to the sensory region of the brain.

Thomas' journey is a testament to the boundless potential of Neuroengineering. However, it also highlights the dire need for a universal standard to guide and regulate this transformative field.

Here is why such a standard is not just necessary but imperative.

Neuroengineering raises profound ethical questions, including issues of consent, privacy, and the responsible use of technology. A universal standard would provide a clear ethical framework, ensuring that the rights and dignity of individuals are preserved throughout their journey. Similarly, the safety of individuals undergoing such procedures is paramount. Standardised safety protocols will help prevent adverse events and build public trust in these life-changing technologies.

As digital technologies and Neuroengineering converge, the importance of data security cannot be overstated. A universal standard for data protection and cybersecurity will safeguard sensitive neural data from potential threats. Besides, such devices may often need to interface with external systems. Establishing interoperability standards will facilitate seamless communication between devices, enhancing overall effectiveness.

As future technologies evolve to create smart Neuroprostheses and implants capable of translating electrical signals to restore brain-to-body communication, the world has the unique opportunity to drive innovation by providing the necessary framework to ensure that these groundbreaking technologies are developed, tested, and utilised for the betterment of humanity.

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5G's trailblazing impact on industries and society

As the world navigates the digital-first approach, connectivity is emerging as the most potent catalyst for economic and social transformation



BY ANAND BHASKAR

Today, India is amidst an extraordinary disruption as digitisation continues to drive significant progress and tackle our most pressing challenges, propelling our nation to the forefront of the new world order in talent, innovation, and commerce.

As we navigate the digital-first world, connectivity has proven to be the most potent catalyst for economic and social transformation, with 5G emerging as the front-runner. Moreover, India's 5G rollout is being hailed as being the fastest globally, and by the end of 2023, we might be ahead of other countries. Its potential to establish a digital highway will serve as the bedrock for flourishing in the era of Industry 4.0.

Most importantly, as developing economies continue to expand and demand for telecom services soars, the need for a sustainable approach has never been more critical. The path to progress lies in striking a delicate balance between economic growth, environmental responsibility, and social inclusion.

EMBRACING SUSTAINABLE PRACTICES

In recent years, telecom operators have made significant strides in adopting sustainable practices. From investing in renewable energy sources like solar panels and wind turbines to implementing recycling and e-waste programs, the industry is demonstrating its commitment to minimising its environmental impact. This concerted effort to reduce carbon footprints showcases the

Telcos are positioned to drive Industry 4.0 success for their customers and partners, inspiring a new era of efficiency, productivity, and connectivity.

transformative potential of sustainability when combined with technological innovation.

DRIVING EFFICIENCY AND PRODUCTIVITY

As a part of this journey, cutting-edge networking solutions have emerged as game-changers in the telecom sector's quest for sustainability. Most importantly, as industries embrace the transformative potential of 5G and Industry 4.0, controlling how the network transports applications is increasingly important to ensure a superior customer experience, and to leverage the benefits of 5G such as networking solutions, facilitating seamless connectivity, data collection, and analysis for data-driven decision-making, fully.

A key advantage of networking solutions is the ability to enhance efficiency and reduce downtime. Through proactive monitoring and predictive maintenance, these solutions help prevent unexpected disruptions caused by equipment failure or communication errors. This approach not only optimises industrial processes but also conserves energy, mitigating the industry's carbon footprint.

Moreover, by leveraging advanced data analytics and machine learning algorithms, businesses can identify bottlenecks and reduce wasteful practices, leading to overall efficiency gains. This newfound efficiency perfectly aligns with the sustainability goals of the telecom sector.

EDGE COMPUTING IN THE 5G ERA

5G and edge computing are paving the way for new use cases across industries. The transformation to cloud-native network functions and distributed cloud computing enables service providers to move beyond traditional connectivity service models. It allows them to offer an edge cloud platform to enable services for vertical-specific participants, providing more innovation and ultimately enhancing customer experience and delivering intelligent traffic routing from the mobile network to the optimal location of the enterprise application.

PUTTING CYBERSECURITY FIRST

The large customer base that service providers deal with makes it vulnerable to malicious actors looking to gain unauthorised access to their data. The

repercussions could damage businesses, consumers, and government agencies.

Focusing on building a robust, integrated, and well-automated cybersecurity architecture to ensure agility and intelligence in threat remediation, and facilitate visibility and management of distributed networks, is key in the telecommunication sector.

SOCIAL IMPACT OF CONNECTIVITY

Beyond technological prowess and environmental considerations, the telecom industry plays a pivotal role in social and economic sustainability. In many developing economies, mobile networks are the primary means of Internet access, empowering individuals and communities with vital communication services. This connectivity, facilitated by telecom operators, bridges the digital divide, propels economic growth, and fosters social inclusion.

As the telecom industry forges ahead, building sustainable and secure digital foundations has become paramount. The journey requires a steadfast commitment to innovation, collaboration, and responsible business practices. Telecom operators are positioned to drive Industry 4.0 success for their customers and partners, inspiring a new era of efficiency, productivity, and connectivity. 5G, with its efficiency, will contribute to making technology applications better, more convenient, and cost-effective, opening doors to inclusive and equitable opportunities.

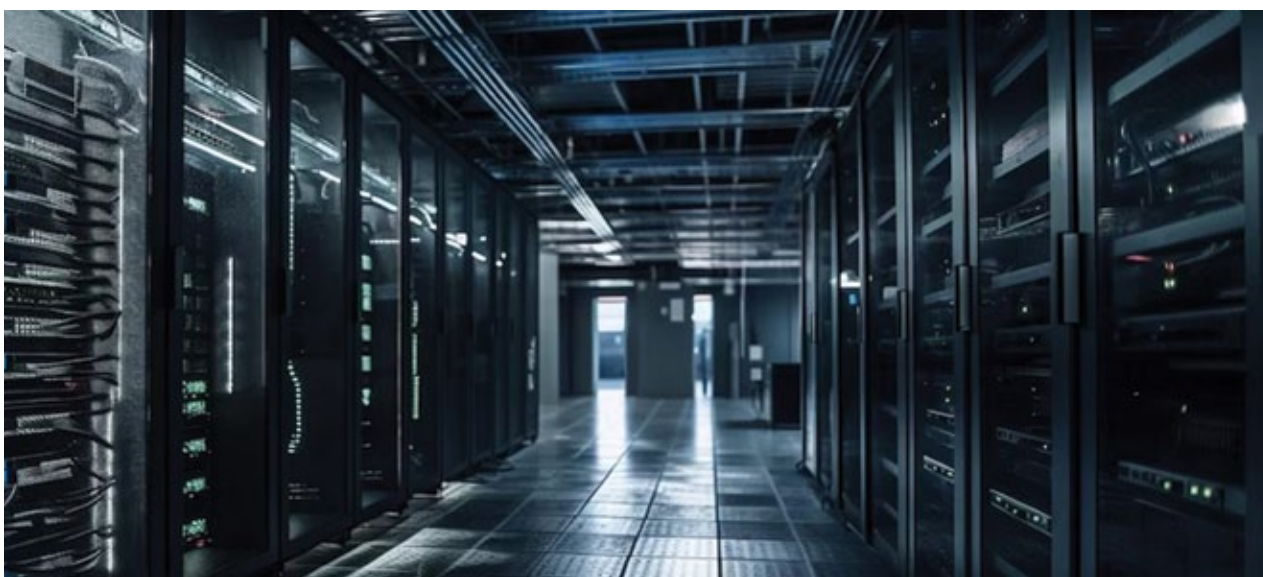
As the world hurtles towards an interconnected future, the telecom industry must recognise its responsibility as a change agent. By integrating sustainable practices, embracing Industry 4.0 solutions, and championing social inclusion, the sector can lead the charge towards a greener, more inclusive world. Together, through collective efforts and shared knowledge, we can pave the way for a future economically, environmentally, and socially prosperous nation. 🌱

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Paving the way for a sustainable digital ecosystem

Implementation of workload coordination and resource allotment approaches can help datacentres make the best use of their resources



BY SHRIKANT NAVELKAR

In an era of growing digitalisation, datacentres have emerged as the fundamental support of our technological framework. However, worries persist over the ecological effects due to their swift growth and power-demanding activities. These datacentres rank among the planet's most energy-intensive establishments, drawing substantial electricity to fuel servers, cooling mechanisms, and auxiliary apparatus vital for their operations. Such elevated energy usage significantly affects the environment by adding to greenhouse gas discharges and ushering climate change.

THE AI POWER CONSUMPTION CHALLENGE

The growing surge of Artificial Intelligence (AI) in recent years has been a remarkable and transformative phenomenon. However, AI models and algorithms are highly resource-intensive and consume significant amounts of power. Training AI models involve massive computational workloads, often requiring specialised

hardware accelerators like GPUs, which consume substantial energy. This power consumption is a major concern when it comes to making datacentres greener.

According to research conducted at the University of Massachusetts Amherst, AI could contribute to around 20% of the total worldwide electricity usage by the year 2030. This is quite worrying, given the anticipation of AI's further proliferation in the upcoming years.

WHAT SHOULD DIGITAL-FIRST COMPANIES DO?

To tackle these concerns, organisations need to embrace sustainable methodologies to enhance the energy efficiency and ecological compatibility of datacentres. Various strategies exist to make datacentres eco-friendly.

#1

Enhance hardware infrastructure efficiency: To reduce the ecological influence of datacentres, organisations have the option to initiate the process by enhancing their

hardware infrastructure. Making the switch to servers and networking equipment that are more adept at conserving energy can result in a notable reduction in power usage.

Approaches like server virtualisation and containerisation allow for improved deployment of resources and their consolidation, ultimately leading to the conservation of energy.

#2

Utilise renewable energy: Datacentres are widely recognised for their significant energy usage. To enhance their environmental friendliness, organisations



SOLVING THE PUZZLE

- Datacentres are crucial in the digital age but raise ecological concerns due to energy-intensive operations.
- AI, while transformative, consumes significant power and could contribute to a substantial portion of global electricity usage.
- To make datacentres greener, organisations can enhance hardware efficiency, use renewable energy, and implement efficient cooling methods.
- Optimising workload management and resource allocation helps reduce energy consumption.
- Implementing datacentre infrastructure management systems provides insights and enhances sustainability.

need to give precedence to the utilisation of renewable energy resources.

The allocation of resources toward solar panels, wind turbines, or the procurement of renewable energy credits can effectively balance the ecological impact of datacentres. Furthermore, organisations have the opportunity to investigate collaborations with nearby utility providers to guarantee a steady supply of clean energy.

#3

Develop effective cooling mechanisms: To ensure servers operate at their best temperatures, datacentres need strong cooling systems. Common cooling approaches frequently result in considerable energy inefficiency.

Introducing cutting-edge cooling methods such as hot-aisle and cold-aisle containment, effective airflow control, and liquid cooling systems can distinctly decrease energy usage while improving cooling efficiency.

#4

Enhance workload optimisation and resource allocation: AI workloads within datacentres can demand a lot of resources, which can result in the ineffective utilisation of computational assets. Through the implementation of workload coordination and resource allotment approaches, datacentres can make the best use of their resources. Equilibrium of workloads, automatic capacity adjustment, and forward-looking data analysis contribute to decreasing energy consumption while upholding peak performance.

#5

Optimise datacentre infrastructure management: Deploying such a management system grants organisations immediate insight into energy usage, surrounding environmental factors, and equipment functionality. Datacentre infrastructure management systems also facilitate preventive monitoring, capacity strategising, and energy enhancement, resulting in more ecologically viable datacentre operations.

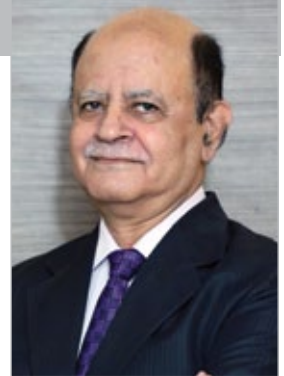
As the demand for digital services keeps increasing, the pressing issue of datacentre sustainability comes to the forefront. By implementing the steps, datacentres can enhance their sustainability and improve their competitive edge. 🌱

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LT GEN DR S P KOCHHAR

TRANSFORMING THE TELECOM NETWORK



Automated networks can revolutionise telecom by creating a responsive, efficient, and resilient environment, enabling innovation in services and applications

The convergence of automation and telecommunication networks marks a revolutionary phase in the history of networking technology. Automated networks, characterised by their ability to self-manage, adapt and optimise, are becoming the foundation for a new era of intelligent and dynamic communications systems. Leveraging cutting-edge technologies like Artificial Intelligence (AI), Machine

Learning (ML) and Software-Defined Networking (SDN), automated networks present an opportunity to redefine the way network resources are managed and optimised.

Let us explore the various aspects of automated networks, from their underlying architecture and key components to applications, challenges and the future landscape.



While the path to full automation may present challenges, the rewards include a more interconnected, intelligent, and prosperous future.



Achieving seamless collaboration among equipment from various vendors within an automated ecosystem is a challenge that needs to be addressed.

Automated networks encompass a range of technologies and methodologies aimed at creating a self-reliant network environment. By implementing automation across different layers of the network, these systems can adapt to changing conditions, forecast potential challenges and respond proactively without human intervention.

KEY COMPONENTS OF AUTOMATED NETWORKS

Software-defined networking (SDN): SDN is a transformative technology that separates the control and data planes in networking devices. By centralising control, administrators can manage the entire network from a unified interface, drastically simplifying configuration and optimisation processes. This separation also paves the way for a more dynamic network, where resources can be allocated or reconfigured in real time based on demand.

Network function virtualisation (NFV): NFV extends the virtualisation concepts familiar from the server world into networking. By decoupling network functions from specific hardware, NFV allows for greater flexibility and scalability in deploying services. It also facilitates the rapid provisioning of network services, reducing costs and enhancing agility.

ML and AI: Machine learning algorithms and AI play a crucial role in automated networks by providing the intelligence needed for predictive analysis and decision-making. Through continuous monitoring and learning, these technologies can detect patterns, predict potential issues and even take pre-emptive actions to mitigate problems, leading to a more robust and adaptive network.

Architecture and design: Automated networks follow a three-tier architecture, including the infrastructure, control, and application layers.

The infrastructure layer consists of the physical and virtual resources, such as switches, routers and servers, which form the backbone of the network. This layer serves as the foundation for network services, and its virtualisation enables more efficient utilisation of resources.

Similarly, the control layer is home to the SDN controller, which orchestrates the network's overall behaviour. By centralising control, it allows for real-time monitoring and management of network resources. This layer serves as the "brains" of the network, translating high-level policies into low-level configurations and adjustments.

The third, application layer hosts various business and consumer applications that interact with the network. These can range from cloud computing platforms to IoT devices to 5G services. By interfacing directly with the control layer, these applications can make dynamic requests for network resources, ensuring optimal performance and user experience.

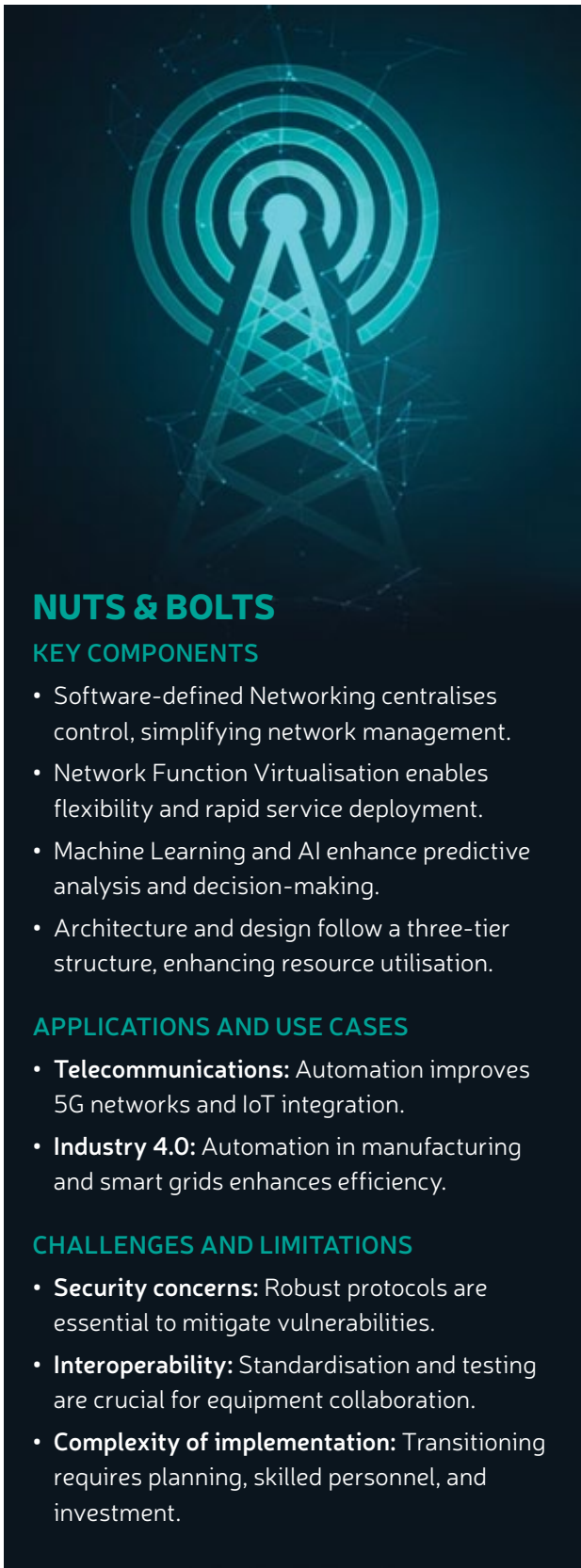
APPLICATIONS AND USE CASES

In today's rapidly evolving technological landscape, automated networks have become a cornerstone of various industries, revolutionising processes and enhancing efficiency across the board. From telecommunications to Industry 4.0, these automated networks are unlocking new possibilities and driving innovation. Let's delve into some key applications and use cases.

Telecommunications: In the realm of telecommunications, automated networks are ushering in a new era of efficiency, performance, and customer satisfaction. For example, automation plays an important role in 5G networks by enabling intelligent routing, load balancing, and resource allocation. This ensures that network resources are utilised optimally, adapting to varying user demands without compromising service quality.

The Internet of Things (IoT) has unleashed a multitude of interconnected devices, each requiring seamless communication. Automated networks step in to manage this complexity gracefully. They provide intelligent routing and resource allocation, facilitating smooth interactions among diverse devices and systems within the IoT ecosystem.

Industry 4.0: Automated networks are at the heart of Industry 4.0, the fourth industrial revolution, where they bring significant enhancements to various industrial



NUTS & BOLTS

KEY COMPONENTS

- Software-defined Networking centralises control, simplifying network management.
- Network Function Virtualisation enables flexibility and rapid service deployment.
- Machine Learning and AI enhance predictive analysis and decision-making.
- Architecture and design follow a three-tier structure, enhancing resource utilisation.

APPLICATIONS AND USE CASES

- **Telecommunications:** Automation improves 5G networks and IoT integration.
- **Industry 4.0:** Automation in manufacturing and smart grids enhances efficiency.

CHALLENGES AND LIMITATIONS

- **Security concerns:** Robust protocols are essential to mitigate vulnerabilities.
- **Interoperability:** Standardisation and testing are crucial for equipment collaboration.
- **Complexity of implementation:** Transitioning requires planning, skilled personnel, and investment.

processes. In the manufacturing sector, for example, automation takes centre stage by enabling real-time data analysis, predictive maintenance, and quality control. Manufacturers can swiftly respond to changes in demand, equipment status, or market conditions, leading to more agile and efficient operations.

Automated networks also play a vital role in energy distribution through smart grids. By providing real-time monitoring and control, they allow for more efficient distribution, fault detection, and energy management, ultimately reducing costs and environmental impact.

CHALLENGES AND LIMITATIONS

While automated networks hold immense promise, they are not without their share of challenges and limitations that must be addressed for their effective implementation. With increased complexity and intelligence, automated networks become susceptible to security vulnerabilities. To mitigate risks, robust security protocols and measures must be in place to safeguard against unauthorised access and potential breaches.

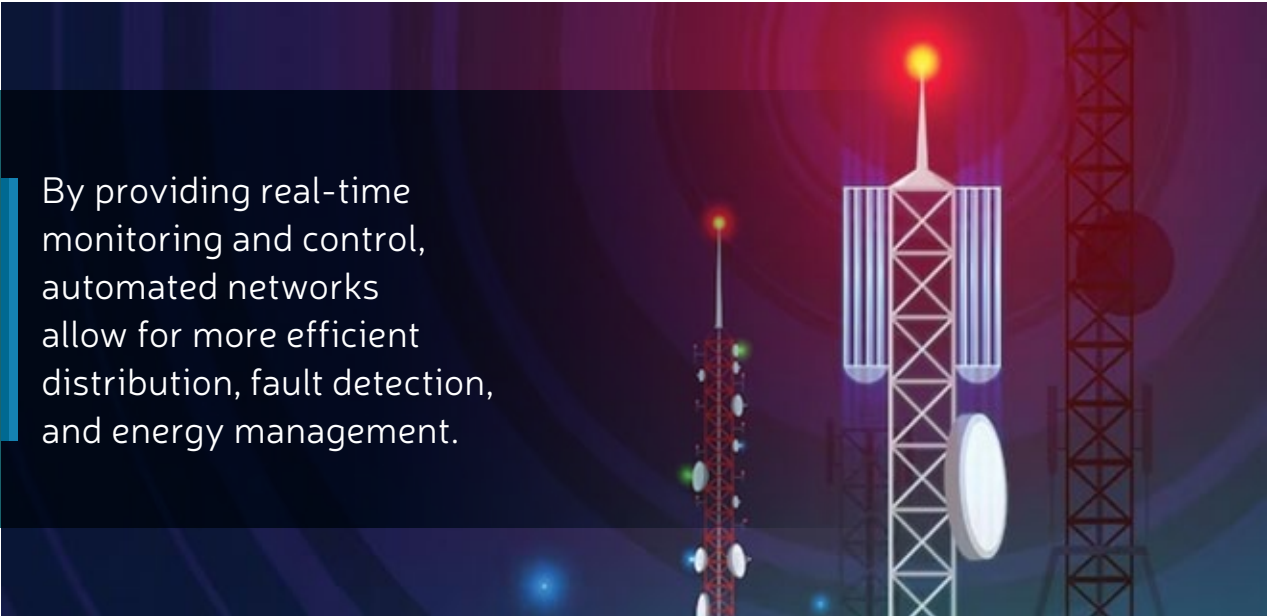
Achieving seamless collaboration among equipment from various vendors within an automated ecosystem is another significant challenge that needs to be addressed. Standardisation and rigorous testing are imperative to ensure that different components can work together cohesively, promoting interoperability.

And then there are the issues driven by the complexities of the implementation. Transitioning from traditional networks to automated ones involves a substantial level of complexity, time, and investment. Comprehensive planning, a skilled workforce, and strategic technology investments are essential to successfully navigate this transition. Careful consideration of the implementation process is crucial to minimise disruptions and maximise the benefits of automation.

Here are some examples of real-world applications of automated networks and how they have benefitted organisations.

#1 SCHNEIDER ELECTRIC AND CAPGEMINI COLLABORATION ON 5G INDUSTRIAL AUTOMATION

Schneider Electric and Capgemini, with support from Qualcomm, have joined forces to accelerate 5G industrial automation. Their collaboration aims to enhance efficiency and connectivity in industrial settings.



By providing real-time monitoring and control, automated networks allow for more efficient distribution, fault detection, and energy management.

Key features of this collaboration include leveraging 5G technology for faster and more reliable communication between machines and systems, seamless integration of IoT devices for real-time monitoring and control of industrial processes, and the creation of smart factories capable of adapting to changes in demand, equipment status, or market conditions.

The impact: This partnership represents a significant step toward Industry 4.0, where automation, connectivity, and intelligence converge in manufacturing processes. It promises more agile and efficient operations, resulting in cost reductions and enhanced productivity.

#2 ORANGE PIKEO'S CLOSED-LOOP NETWORK OPERATIONS AUTOMATION

Orange Pikeo, demonstrated by HPE and Orange Innovation at the Mobile World Congress 2023 in Barcelona, showcases the automation of 5G operations through a closed-loop process.

Key features include the integration of assurance and orchestration to automate 5G operations, ensuring optimal performance and reliability, real-time monitoring and control of network resources for quick adjustments and adaptations, and the use of AI and ML to detect patterns, predict potential issues, and take preemptive actions to mitigate problems.

The impact: Orange Pikeo represents a significant advancement in network automation, providing a

responsive and resilient environment for 5G operations. It opens up exciting possibilities for new services and applications across sectors, from healthcare to transportation to entertainment. Implementing closed-loop automation will be crucial for the success of 5G networks in meeting the demands of a constantly evolving technological landscape.

THE FUTURE PROSPECTS

Automated networks have the potential to transform the telecommunications landscape. By providing a more responsive, efficient, and resilient environment, they offer opportunities for innovative services and applications, across various sectors, from healthcare to transportation and entertainment.

They represent a major evolution in telecommunications, combining virtualisation, artificial intelligence, and advanced networking principles. The benefits in terms of operational efficiency, adaptability, and the creation of new services are substantial. To remain competitive and innovative in our ever-changing technological world, telecom operators and related industries must embrace automated networks. While the path to full automation may present challenges, the rewards include a more interconnected, intelligent, and prosperous future. 🌟

The author is the Director General of the Cellular Operators Association of India (COAI).

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Are private 5G networks ready for prime-time in India?

The regulatory confusion on sourcing of spectrum has delayed the adoption of this potentially transformative enterprise technology in India



BY VERNIKA AWAL

Pivate 5G networks, which refer to captive, non-public 5G networks that can only be used by a specific entity that has purchased such a network, can be disruptive in terms of their ability to boost and transform businesses. However, even as India continues to notch up new record figures in the consumer 5G space, adoption of the business use cases for private 5G – which were once billed to be the top use case for the present latest generation of the network standard – remains weak in India right now.

While a large part of this stunted adoption was driven by regulatory confusion in terms of sourcing the 5G spectrum, this has now been somewhat clarified – albeit not in favour of enterprises. Has this finally cleared up the path to growth for private 5G networks in India?

THE REGULATORY 'CONFUSION'

In 2022, a set of regulatory guidelines released by the Department of Telecommunications (DoT) suggested that enterprises could be allowed to lease 5G spectrum



“The market, while focusing on enterprise use cases, is evaluating the use of several technologies, such as Wi-Fi, private LTE (4G), public 5G and private 5G.”

Pulkit Pandey

Principal Analyst, Gartner

directly from the Centre’s telecom department for use within their operations, alongside having the option to ask a telecom operator to set-up such a network for them. Entities such as industrial conglomerate Larsen & Toubro, as well as IT services major Infosys, were at the forefront of lobbying for direct sourcing of private 5G spectrum from the DoT.

Telcos, however, had a different opinion. The likes of Bharti Airtel and Reliance Jio, since the DoT recommendation, lobbied to prevent direct sourcing of 5G spectrum to businesses. Industry experts stated that this was an expected move since enterprise network deployments make for one of the largest revenue drivers for most telcos.

“If you look at today’s consumer businesses run by telcos, they have very low average revenue per user (ARPU), which in turn leaves telcos with a wafer-thin margin. Enterprise contracts, as well as tertiary revenue from value-added services, are extremely crucial for the overall good health of the sector. Hence, it was hardly surprising that telcos pushed back against the DoT’s idea of directly leasing spectrum to enterprises for private 5G deployments,” said a veteran industry consultant who works with multiple leading IT services firms, requesting anonymity.

While an official notification is awaited, and so is the adoption of the new, impending telecom bill, multiple media reports affirmed that the DoT has largely decided against sourcing spectrum directly to enterprises – citing that the present legal framework would not allow such a transformative process. This decision, which industry stakeholders say has been conveyed to both telcos and enterprises, has cleared up the ‘regulatory confusion’ that was present in the industry so far.

WHY BUSINESSES NEED PRIVATE 5G?

So, does that imply that private 5G networks are finally ready to take off? The answer is not that simple. But before we proceed, it’s important to understand what

adoption of private 5G networks would bring to the table for enterprises.

First, private 5G networks will allow a company to have access to spectrum for a connectivity network that will only be accessible within its facility or infrastructure. By doing this, companies stand to benefit from the ability to customise an internal network to its exact required configuration, including cyber security standards, latency and bandwidth, reduced concerns around network congestion, and the ability to closely monitor a closed-loop network away from external interference.

If deployed at scale, the cost of a company’s own private 5G network would also eventually be lesser than the recurring operational expenses to be incurred if the firm licenses a telco to lease public spectrum for their enterprise network.

DEMAND FOR SUCH NETWORKS?

Yes, there is clear and significant global demand, wherein the enterprise 5G market is pegged to grow at high double-digit figures, according to industry estimates. Clear evidence of increasing adoption is seen in Ericsson’s June 2023 Mobility Report, which indicates that the number of connection endpoints of the Internet of Things (IoT) deployments around the world is set to increase at a compounded annualised growth rate (CAGR) of 18%. IoT deployments refer to the use of smart sensors and related equipment that facilitate the digital transformation of a facility, under the aegis of Industry 4.0.

A top executive at a leading IT services firm, who requested anonymity due to ongoing internal plans around their own private 5G deployment, said that there is “significant interest among Indian enterprises to consider adoption of private 5G services.”

“If you look at the long-term cost benefit of setting up private 5G networks, there is plenty for various stakeholders to gain. From large service providers to industrial entities themselves, setting up private 5G

From large service providers to industrial entities, private 5G networks could eventually cut down operational costs in the long run.

networks could eventually cut down operational costs majorly in the long run,” the executive added.

Pulkit Pandey, Principal Analyst at Gartner, said that the industries that are seeking to adopt private 5G networks “include manufacturing setups such as mobile factories, autonomous transportation and guided vehicles

within campuses; smart surveillance, remote patient monitoring, smart hospitals and automated healthcare assistants in healthcare, aerospace and defence, energy and utilities, and ports and airports.”

For some industries, the implication of private 5G networks is greater on the cyber security end, over other aspects. For instance, a defence division’s operations will need a private 5G network since such a network would be better configured, deployed and monitored – as opposed to public networks that could be exposed to greater threats.

WHAT ARE THE CHALLENGES?

The second executive quoted above added that one concern for private 5G adoption is cost. “Due to the higher initial setup cost, medium and small businesses will almost entirely refrain from adopting private 5G networks. This is a key roadblock, further exacerbated by concerns around whether leasing private 5G networks through telcos may make sense cost-wise for these firms (or not),” he said.

Gartner’s Pandey raised another issue around adoption: awareness. “The market, while focusing on enterprise use cases, is evaluating the use of several technologies, such as Wi-Fi, private LTE (4G), public 5G and private 5G. The challenge that often arises is to educate the market about the capabilities and differences between these technologies. It is important to understand that different use cases have different bandwidth and latency requirements, which might prompt the selection of different technologies,” Pandey said.

As a result, Pandey estimates that 2023 will largely be the year of early adopters while 2024 could see significant adoption across industries. A report by market statistics firm Research and Markets pegs the industrial IoT market to grow at 13% CAGR through 2027 – rising to nearly Rs 77,500 crore, from Rs 42,200 crore in 2022. This implies that while there is growth potential, the realisation could take a while to come through.

The fortification of the new telecom law could further help in this regard. 🌟

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IN SHORT

- Potential benefits for enterprises: Private 5G networks offer customisation, security, and cost-saving advantages.
- Spectrum sourcing challenge: Telcos’ resistance to direct spectrum sourcing for businesses contributed to delays.
- Growing global demand: The global enterprise 5G market is expected to grow significantly, driven by IoT deployments.
- Pending challenges: Cost, awareness, and adoption hurdles need to be addressed for widespread private 5G adoption.

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Snapdragon to power real-time data insights in Mahindra SUVs

Qualcomm Technologies and Mahindra & Mahindra have joined forces in a strategic partnership to leverage Qualcomm's Snapdragon Digital Chassis Solution cloud-connected services platform for Mahindra's upcoming SUV range. The Snapdragon Digital Chassis Solution is a comprehensive suite of connected car services designed to enhance the performance and connectivity of vehicles. Notably, Mahindra is the first global automaker to adopt Data Insights with edge diagnostics as part of the Snapdragon Digital Chassis platform.

One of the key components of this collaboration is the Data Insights with edge diagnostics feature, aimed at providing data-driven diagnostics for Mahindra's SUVs. This technology will be instrumental during pre-production vehicle testing, offering real-time analysis of in-vehicle data. This enables Mahindra to identify and rectify issues promptly, resulting in cost savings and faster development processes.

Data Insights with edge diagnostics empowers automakers to collect and analyse data related to development and testing issues, including system errors, crashes, memory problems, and more. It also swiftly alerts engineers to unresponsive vehicle systems, allowing for prompt resolution. Additionally, this technology facilitates the storage, search, archiving, and filtering of data logs in the cloud.



This collaboration extends the existing partnership between Mahindra and Qualcomm Technologies, which recently cooperated to provide Snapdragon Cockpit Platforms for Mahindra's Scorpio-N and XUV700 SUVs. These platforms offer advanced features like personalisation, natural interaction with the vehicle, virtual assistance, and immersive audio-visual experiences, all powered by scalable AI-based technology.

This strategic alliance between Qualcomm and Mahindra & Mahindra demonstrates their commitment to advancing automotive technology and providing customers with cutting-edge connected car experiences.

Route Mobile to deploy A2P SMS monetisation solutions for Vodafone Idea

Cloud communications platform provider Route Mobile Limited has signed a partnership with Vodafone Idea Limited (VIL) to deploy a comprehensive suite of Application-to-Person (A2P) monetisation solutions. This strategic collaboration encompasses the deployment of an Artificial Intelligence/Machine Learning (AI/ML) driven analytical firewall solution and an SMS Hub on the VIL network.

Under this agreement, Route Mobile will deliver end-to-end A2P monetisation solutions for all A2P SMS traffic on the VIL network, which includes the former Vodafone and Idea networks. This initiative aims to protect customers from spam and phishing while maximising revenue.

Route Mobile has a successful track record of deploying firewall solutions for Mobile Network Operators (MNOs) worldwide. VIL will benefit from these solutions, which

enable MNOs to combat unwanted and malicious messages through real-time traffic analysis and detection. The solution utilises proprietary message simulators, traffic analysis tools, business intelligence, data analysis, and intelligence databases to block illegitimate grey route traffic and monetise A2P SMS traffic effectively.

Previously, the Idea Cellular network leveraged Route Mobile's firewall solutions until April 2022. Now, Route Mobile's solutions will be implemented exclusively across the entire Vodafone Idea network. In addition to firewall solutions, VIL will leverage Route Mobile's scalable CPaaS platform to efficiently process international A2P SMS traffic on its network. This exclusive partnership promises significant value for both Route Mobile and Vodafone Idea Ltd., one of the world's largest telecommunications network operators.

Nokia rolls out Interleaved Passive Active Antennas for Globe Telecom



Nokia has announced that it is deploying its state-of-the-art, modular Interleaved Passive Active Antenna (IPAA+) for Globe Telecom Inc., across the southern islands of the Philippines. The move will help to accelerate 5G deployment in the region.

Nokia's advanced IPAA+, has a light, modular design and supports all 5G frequency bands in a single compact antenna including the 2.6 GHz spectrum band. It also can support other bands, which means investments are protected. They will enable Globe Telecom to accelerate and simplify 4G/5G rollouts, while also delivering a higher level of network efficiency and performance, as well as faster return on investment.

Service providers face the challenge of finding additional space on towers and rooftops to add 5G antennas. Nokia's IPAA+ accelerates the deployment of 5G by addressing this physical issue. Nokia's new IPAA+ is the size and weight of a standard multiband antenna and makes it easier and faster for service providers to deploy their 5G networks through just a simple antenna swap. Combining the 4G passive and 5G active antennas into a compact solution can also help lower site rental costs and acquire sites faster.

Nokia and Globe's engineering team also successfully trialed a Globe Telecom-specific variant of the IPAA+ in the field. The field test was carried out in Tantaran, South Cotabato on the island of Mindanao, making Globe Telecom the first operator in the world to successfully test the 2.6 GHz IPAA+ variant.

HPE implements intelligent wireless infra for Kurly in Korea



Hewlett Packard Enterprise (HPE) has established an automated, network architecture, including intelligent wireless LAN infrastructure from HPE Aruba Networking, to create a state-of-the-art logistics system for Korea's leading retail technology company, Kurly, for simpler, highly automated and more reliable operations and logistics.

Kurly, founded in 2014, pioneered overnight delivery with a fully integrated refrigerated supply chain. Using data-driven insights, Kurly optimised logistics, forecasting demand, and reducing waste through automation. In May 2023, Kurly inaugurated its largest logistics centre in Pyeongtaek, South Korea, a vital step in its distribution network expansion.

To ensure uninterrupted services at the 24/7 logistics centre, HPE Aruba Networking deployed an intelligent wireless LAN infrastructure with HPE Aruba Networking Mobility Conductor. This system can handle 1,000 mobility controllers, simplifying management, ensuring scalability, and enabling firmware updates without service disruption.

With over 10 million customers, Kurly requires high-performance solutions. HPE introduced the HPE Aruba Networking CX Switch Series, offering a robust 19Tbps capacity to support seamless operations during peak traffic. The network configures itself to manage all traffic, supporting virtualisation, automation, and redundancy for safety.

In a logistics environment prone to network interference, HPE employed HPE Aruba Networking AirMatch AI technology. This system learns channel status and automatically assigns optimal radio frequency channels to access points every 24 hours, maintaining radio quality.

Kurly enhances wireless service quality with AI-enabled HPE Aruba Networking UXI sensors integrated into small wireless devices used for logistics management. This creates a network quality detection system, swiftly identifying and resolving issues, and ensuring Kurly's logistics network operates smoothly.

Ericsson, AWS, and Hitachi showcase smart factory potential

Ericsson, Amazon Web Services (AWS), and Hitachi America R&D have partnered to showcase the immediate transformative capabilities of 5G, artificial intelligence (AI), and automation solutions in the manufacturing sector. These technologies promise to enhance productivity, efficiency, environmental sustainability, safety, and cost-effectiveness.

The collaboration witnessed a private 5G infrastructure trial at Hitachi Astemo Americas' electric vehicle manufacturing plant in Berea, Kentucky, USA. Ericsson's Private 5G solution, combined with the AWS Snow Family, formed the backbone of this initiative, enabling private cellular networks essential for implementing machine learning (ML) models within the Hitachi manufacturing complex.

Real-time video analytics powered by Hitachi detected defects in component assembly operations through Ericsson's private 5G network, reducing material wastage and production losses. This breakthrough marks a significant stride in amalga-

mating multiple technology components within the manufacturing industry.

Ericsson's Private 5G, built on 4G and 5G radio technology, offers versatile applications for indoor and outdoor settings while seamlessly integrating with business operations, devices, and applications. This integration enhances productivity, cost-efficiency, and energy conservation.

This innovative private network solution ensures secure and reliable 4G and 5G connectivity and rapid deployment, making it suitable for various industries, use cases, and complexity levels within the enterprise sector. Ericsson, AWS, and Hitachi America R&D are pioneering innovation through their collaborative efforts in bridging manufacturing and technology.

Thomas Noren, Head of PCN Commercial and Operations at Ericsson, emphasised that these solutions are available for immediate deployment, demonstrating the tangible benefits of this partnership in driving industry innovation.

Vertiv launches neural network-driven power management solution

Critical digital infrastructure and continuity solutions provider, Vertiv, has introduced the Vertiv Liebert AF4, a new set of active harmonic filters driven by Artificial Neural Network (ANN) technology. This innovation is aimed at addressing the growing significance of power quality in India's facility electrical distribution systems.

With an increasing deployment of electronic components in manufacturing processes, there is a rising concern regarding current distortion from these components. Such distortion can adversely impact the quality of the source voltage waveform, potentially leading to component malfunctions or failures. Ensuring power quality in the distribution system is vital to maintain production continuity and reduce equipment maintenance costs and downtime.

The Liebert AF4 leverages high-speed Insulated-Gate Bipolar Transistor technology, working in parallel with the load, to enhance power quality management



in manufacturing and datacentre facilities, regardless of the loading conditions. It effectively addresses harmonic currents, improves power factor, balances three-phase source currents, and compensates for neutral harmonic currents.

The Liebert AF4 features a 7-inch capacitive touchscreen display equipped with an adaptive artificial neural networks control algorithm, offering an impressive dynamic response time of 100 microseconds. Operating on intelligent ANN-based control, it accurately identifies downstream load current components, including active, reactive, harmonics, and unbalanced elements. By precisely controlling IGBTs, the Vertiv Liebert AF4 efficiently eliminates unwanted harmonic components at the load end.

Vertiv's Liebert AF4 represents a significant advancement in ensuring power quality and reliability within facility electrical distribution systems, addressing the evolving demands of modern manufacturing and datacentre environments in India.

DATAQUEST SEPTEMBER 2023: DATAQUEST-CMR RANKING OF TOP 100 ENGINEERING COLLEGES BASED ON EMPLOYABILITY INDEX

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TV RAMACHANDRAN

POWERING NEXT-GEN WIFI AND BROADBAND FOR ALL

India needs the full 6 GHz band unlicensed to leverage the power of wireless connectivity, empower communities, and transform the country's digital landscape



The assignment of an increased quantum of suitable unlicensed spectrum for WiFi has become a driving force for digital movement around the world. The adoption of established modern WiFi technologies such as WiFi 6E makes possible high-quality broadband that matches 5G capabilities while remaining affordable for the common man. This is essential with the insatiable hunger for modern wireless services that aid every aspect of day-to-day living, including healthcare, education, work and logistics. The target in all major countries is now to have a one-gigabit broadband connection in every household which can be used for access to immersive cloud-based services including HD video, gaming and augmented/virtual reality.

In this scenario, there is, naturally, heightened priority in all major regimes to make available the widest contiguous frequency range of 1200 MHz in the 6 GHz band (5.925 GHz–7.125 GHz) for WiFi to boost broadband connectivity, R&D and innovation. With its growth targets and digital ambitions, India naturally has to take a leadership position in this critical area.

IS IT REASONABLE FOR 5G TO DEMAND 6 GHZ?

While global cellular data continues to grow to fuel wireless services, the rate of growth is no longer skyrocketing and has actually slowed down from more than 90% in 2018 to 34% in 2021 and further to about 22% in 2022, according to Analysys Mason. Data usage per mobile broadband subscription in the OECD countries grew a modest 17%




Allocating the complete 6 GHz band for licence-exempt access including WiFi will help reduce the environmental footprint of telecom networks.

No country has assigned all the available spectrum to mobile networks, with the majority allocating less than 60% of the spectrum identified for IMT/5G.

in 2022, compared to an average annual growth rate of 29% between 2017 and 2021. In India too, the growth rate has fallen from 80% in 2018 to 10% in 2023. The reason for reviewing the data growth levels is to help assess the requirement of the basic resource of spectrum to cater to mobile data. The softened growth levels imply less pressure for augmentation of the spectrum.

In the above context, it is of interest to examine the availability of spectrum for the current mobile standard of 5G. A study by Plum Consulting found that no country has assigned all the available spectrum to mobile networks, with the majority allocating less than 60% of the spectrum identified for IMT/5G. Even most of the 5G use cases that are running as of today are on the 4G/LTE network, thereby underscoring the point that even those 5G spectrum bands that have been allocated are not being adequately utilised (see box Spectrum Bands below 7GHz).



SPECTRUM BANDS BELOW 7GHz

- **1886 MHz:** Spectrum identified globally for IMT below 7GHz
- **1014 MHz:** Spectrum assigned to mobile operators in India below 7 GHz
- **940MHz:** Spectrum sold and allocated to mobile operators in India below 7 GHz

The scenario in India is more or less aligned with the global situation, where the identified spectrum bands for IMT have yet to be fully assigned by each country's administration. Even amongst those bands which have been assigned, all the bands have yet to be allocated and those that have been allocated, are yet to be optimally utilised by the telecom operators. However, the cellular lobby continues to push for more new spectrum bands to be identified for IMT/5G services, which are either being already used by incumbents or could be gainfully utilised by other wireless technologies such as WiFi and satellite.

The Plum report makes the following key observations.

- Instead of demanding more spectrum to be identified for IMT/5G in new spectrum bands which are already being used by incumbents, regulators and governments should be encouraged to complete the allocation of the assigned spectrum bands to the IMT/5G operators. This would enable mobile networks to get at least large amounts of harmonised spectrum, for which a global ecosystem is already available.
- Technology upgrades and densification, including the use of mmWave and small cells, will play an important role in enabling mobile operators to meet future demand for mobile data, both up to 2030 and beyond.
- The spectrum is allocated nationally but is not used nationally. Operators use mmWave and even 3400 MHz bands in urban areas where population density is higher. To meet the demand in such areas, alternative mechanisms such as WiFi offload, fibre connections or peer-to-peer technologies can be used to meet capacity constraints without any need for additional spectrum.
- Spectrum refarming in the lower spectrum bands (below 3 GHz) and utilisation of unused but assigned and allocated mmWave bands would help in better spectrum management for IMT/5G services and applications. This would enable other wireless technologies such as WiFi and satellite to make more efficient use of new spectrum bands, viz., 6 GHz.

ADVANTAGES OF UNLICENSED 6 GHZ

1. WiFi is the default solution for indoor connectivity with indoor data growth accounting for 80-95% of overall IP traffic. The demand for wireless connectivity is only going to increase in the future. Industry reports suggest that WiFi traffic increases with each cellular generation.
2. As pointed out by AK Tiwari, former Member (T), Department of Telecommunication, it is irrelevant to speculate whether the unutilised portions of unlicensed 2.4 and 5 GHz are adequate for WiFi and to say that unlicensed 6 GHz is probably not required. Applications of AR, VR, and sophisticated gaming can only work with the wide carriers possible only if 6 GHz is delicensed. It indicates that the applications and use cases in unlicensed 6 GHz bands are different and cannot work in any other band.
3. The next generation of wireless connectivity (e.g., 6G) use cases cannot be delivered by wide area networks as these use cases require computational resources and connectivity that is hundreds if not thousands of times faster than the current 5G/IMT implementation. As pointed out by the WiFi Alliance, these use cases will be predominated by immersive experiences such as virtual, augmented and extended reality, wearables, telehealth, industrial automation, IoT, 3D video, etc. Instead of wide area networks, next-gen connectivity will rely majorly on local area short-range communications such as the next-gen WiFi.
4. 5G/IMT networks cannot co-exist with incumbent services in the 6.425 to 7.125 GHz frequency band or deliver commercially viable services. It is also reliably understood that there are no 5G networks or devices in the 6 GHz band anywhere in the world.
5. India is already seriously deficient in terms of the allocated quantum of the unlicensed spectrum, having only about 0.65 GHz against most leading countries in the world. The 1200 MHz of unlicensed 6 GHz will go a long way to qualitatively reduce this handicap.

5G/IMT networks cannot co-exist with incumbent services in the 6.425 to 7.125 GHz frequency band or deliver commercially viable services.

The 6 GHz spectrum band, which is currently being demanded by the IMT/5G lobby, has already seen significant development of the WiFi ecosystem with the availability of WiFi 6E and WiFi 7 devices which work exclusively in this band and new high bandwidth applications and use cases, viz., AR/VR/MR already being developed in this band. On the other hand, there is no development of the IMT ecosystem in this band anywhere in the world.

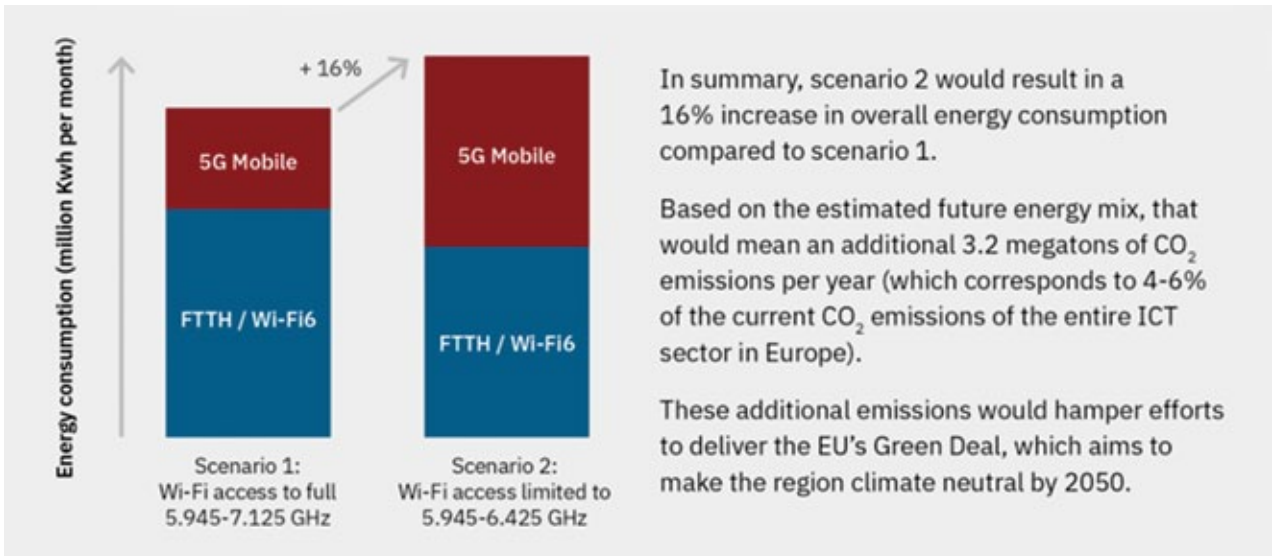
THE SUSTAINABILITY ADVANTAGE

Air pollution is the world's top threat to public health, responsible for reducing average life expectancy by 2.3 years worldwide, according to a recently published report by the University of Chicago's Energy Policy Institute. According to this report, India's population is disproportionately impacted by air pollution. In considering the future of the 6 GHz frequency band, India's frequency spectrum regulators have a real opportunity to bring about a positive change with significant reductions in CO2 emissions.

A new analysis provides a quantifiable impact assessment of the IMT or WiFi operations in the 6.425-7.125 GHz frequency band and their effect on greenhouse gas emissions. It is already well established that WiFi technology excels in low-power, cognitive radio techniques including spectrum sensing, spectrum sharing and adaptive transmission. These techniques enable WiFi to significantly outperform IMT in energy efficiency.

But in deciding on the best use of the 6 GHz band, India's regulators may wish to consider the fact that the vast majority of connectivity, i.e., up to 80% of all data traffic – even traffic on mobile devices – occurs indoors. From video streaming, video calls or cloud-based distributed computing to Artificial Intelligence or industrial automation, indoor connectivity use cases predominate.

The growing demand for indoor connectivity is confirmed by the fact that, despite high installation costs, most countries are prioritising fibre broadband capabilities. These broadband deployments require corresponding local area wireless connectivity, the WiFi,



for distribution to end users because most use cases and devices are not equipped to connect to broadband, for example, fibre terminals. This necessary capability cannot be achieved without sufficient spectrum for WiFi.

In contrast, from the energy conservation perspective, the 5G/IMT networks are highly inefficient in providing indoor connectivity. The 5G/IMT signals must blast through building walls or windows, expending high levels of transmit power just to reach end users. Similarly, signals from indoor 5G/IMT user devices to an outdoor base station use a disproportionate amount of energy just to overcome obstacles and distances in the propagation path, necessitating frequent recharge cycles, increased battery wear and additional electronic waste.

This wasteful use of energy is exacerbated by the eco-centric building construction which adds more insulation to walls and windows – further blocking outdoor-to-indoor 5G/IMT signals. In contrast, energy used by WiFi devices to communicate with nearby access points is far less than that needed for distant 5G/IMT base stations.

According to a new study by WIK-Consult, fibre and WiFi networks are 2.5x more energy efficient per megabyte transmitted than 5G cellular networks. WIK-Consult estimates that precluding WiFi access to the 6.425-7.125 GHz will lead to congestion and degradation in the fibre and WiFi performance, driving a 15% increase in data traffic over mobile networks. The increased reliance on mobile networks, in turn, will result in 16% higher energy consumption, which would lead to 3.2 megatonnes of additional CO₂ emissions in Europe per year by 2030. Although the WIK-Consult study did not

analyse other regions, its findings and conclusions are consistent and applicable worldwide.

This report clearly shows that WiFi access to the 6.425-7.125 GHz band will enable greater use of fibre/WiFi (rather than 5G/IMT) to deliver gigabit connectivity, which will reduce the environmental footprint of telecom networks and thereby support national efforts to advance sustainability, energy conservation and climate-neutral goals.

According to the report, allocating the complete 6 GHz band for licence-exempt access including WiFi helps reduce energy consumption and the environmental footprint of telecom networks globally.

India, with its positive commitments in COP26 as well as its national goal of 'Broadband for All', direly needs such savings. We need the full 1200 MHz of 6 GHz as an unlicensed spectrum.

Regardless of industry positions, it is eminently clear that the most feasible long-term path for use of the 6 GHz band is unlicensed use for primarily indoor outdoor-indoor WiFi + FS + FSS. The Government of India and the TRAI should facilitate this usage expeditiously to leverage the power of wireless connectivity to transform the country's digital landscape and empower communities. 🙌

*The author is the President of Broadband India Forum.
Views are personal.*

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[COVER STORY]

DATA CENTRE

GROWING BEYOND TRADITIONAL HUBS

As the demand for data localisation rises and India's digital user base grows in volume, datacentre firms are eyeing cities beyond the metro hubs

BY VERNIKA AWAL

Datacentres are not new to India – since the rarity of the 2008 datacentre set up by the Centre's National Datacentre, the industry has seen steady growth. Nothing, however, set the market up for the meteoric growth that it has seen like Reliance Jio, whose democratisation of the Internet in India has led to massive proliferation of mobile data connectivity nearly everywhere in India. Of late, datacentres are reaching an inflection point, which is leading to their rising proliferation beyond the established hubs. This, in turn, is pushing datacentre operators to look more significantly at Tier-II markets, which could soon see a real estate and employment boom driven by a rise in such datacentres around the country.

Before we proceed further, it is important to understand why this growth is happening. Datacentre capacity has been on a steady increase not just in India,

but around the world. Real estate research firm Cushman & Wakefield's 2023 datacentre research report pegs the global online datacentre capacity at 7.4GW, while planned and sanctioned capacity is significantly higher than this.

India, interestingly enough, plays a key role in this. For instance, a report by market researcher Savills India from 30 January this year said that the total data capacity, including online and sanctioned, is likely to cross 1GW this year itself.

Why this increase, though? The answer lies in the country's social fabric.

With a clear drop in the overall price of data, India today has a massive Internet user base. Data from the Telecom Regulatory Authority of India (TRAI) for June, released on 24 August, pegged India to have over 86 crore Internet users, including fixed broadband lines and



“Tier II and Tier III cities, offer a strategic advantage for expanding datacentre infrastructure while optimising operational expenses.”

Rohan Sheth

Head – Datacentre & Colocation Services, Yotta Infrastructure



“People essential to day-to-day datacentre operations are fast becoming a scarce resource, as technologies powering these facilities evolve at a rapid pace.”

Manoj Paul

Managing Director, Equinix India



SUMMING UP

- **Surging Data Demand:** India’s expanding internet user base, driven by lower data prices, is boosting data-driven services and creating substantial demand for datacentres.
- **Edge Computing Boon:** Edge computing is becoming pivotal for low-latency operations, benefiting datacentre operators.
- **Tier-II City Expansion:** Datacentre operators are increasingly looking to Tier-II cities, driven by lower land costs and growing demand.
- **High-Skilled Job Opportunities:** Datacentres offer opportunities for high-skilled tech jobs, contributing to job growth beyond major cities.
- **Regulatory Environment:** India’s regulatory environment, including data localisation mandates, is poised to support the growth of the datacentre industry.

mobile internet subscribers. This means that over 60% of India’s total population is on the Internet today.

This increase has led to the proliferation of data-driven services, further exacerbated by the COVID-19 pandemic. From video conferencing, instant messaging and social media through platforms such as WhatsApp and Instagram, the rise of over-the-top entertainment services such as Netflix and Spotify for music and videos, instant payments through the record-setting UPI framework, and so on, we are today a massive data-using nation.

WITH GREAT DEMAND, COMES GREAT EXPANSION PLANS

To offer these services, companies today are in a race to increase the speed of connectivity and bolster the smoothness of the Internet experience. This is done through what is known as edge computing, the act of bringing the data processing hub closer to where a user is. This, in turn, spells a boon for datacentre operators. As Rohan Sheth, head of datacentre and colocation services at Mumbai-based Hiranandani Group’s Yotta Infrastructure says, “Edge computing serves as a powerful solution for executing operations that demand extremely low latencies and flexible programming runtimes. By processing data closer to the data source, edge computing minimises the delays in data transmission, making it ideal for applications that require real-time responses.”

To facilitate this edge computing, comes the need for edge datacentres, too. Manoj Paul, managing director of datacentre operator Equinix India, lists nine points that are facilitated in this regard by edge datacentres – lower latency, faster response times, bandwidth optimisation, improved scalability, enhanced security and privacy, local data compliance, support for real-time analytics, resilience and redundancy, and content delivery.

All of this is crucial for any datacentre operator to provide, to attract greater business demand for their server racks. Paul says that Equinix has set a rather lofty target



“Datacenter infrastructure demands heightened focus on sustainability and energy security, especially with the rise of AI and development of hyperscale parks.”

Sanjay Bhutani
Chief Business Officer, AdaniConneX

here: “Soon, Equinix would have datacentres in India which would be within 10-30 msec from any major city.”

Amit Agrawal, chief business officer at fellow datacentre operator Web Werks, adds more nuance to this discussion. “Digital will soon become a lifestyle choice, thanks to the burgeoning Indian millennial population. Due to high bandwidth and transmission demands, datacentres will need to be ready to deal with changing latency and workloads. Latency becomes a significant factor as the majority of businesses are migrating their critical data to the cloud. Datacentres need to incorporate hybrid computing architectures,” he says.

Case in point: In November last year, Yotta announced north India’s first hyperscale datacentre with a net capacity of 160 MW. This massive facility was set up in the National Capital Region (NCR)’s Greater Noida suburb and is expected to serve the bustling circle of regions around Delhi. Yotta’s Sheth further affirmed expansion plans of edge datacentres in Tier-II and Tier-III cities like Bhubaneswar, Chandigarh, Coimbatore, Guwahati, Indore, Jaipur, Lucknow, and Nagpur.

In a similar act of looking inward, Web Werks confirmed that it is also looking at inward markets. The company is set to open a 32 MW datacentre in the city of Rabale, a Tier-III market, by the end of 2025.

AdaniConneX, an Adani Group datacentre operation, also confirmed that its expansion plans include setting up

datacentres in cities such as Visakhapatnam and Pune, as it builds towards a net datacentre capacity of 1GW before the end of 2030.

WHY LOOK INWARD, THOUGH?

But, is it only latency that is driving the demand for edge datacentres? While it is undeniably an important factor, one big reason that plays a key role is real estate expenditure. In April this year, real estate firm JLL India projected that real estate demand from the datacentre sector is going to rise to a mammoth 9.1 million square feet.

But, with such rising demand juxtaposed with rising real estate demand from consumers as well, the cost of procurement of such vast amounts of land is also bound to increase. Markets in Tier-II cities and beyond therefore serve a multi-fold purpose, that of bringing the data closer to the users, bolstering the scalability of tech services, and reducing the cost of acquisition of the scale and size of land required as well.

As Yotta’s Sheth says, “Setting up a datacentre involves significant expenditure, with a substantial portion dedicated to real estate acquisition and development, reflecting the crucial role of physical infrastructure in housing and operating datacentre facilities. As land costs remain comparatively lower across Tier II and Tier III cities, these regions offer a strategic advantage for expanding datacentre infrastructure while optimising operational expenses.”



“Due to high bandwidth and transmission demands, datacentres will need to be ready to deal with changing latency and workloads.”

Amit Agrawal
Chief Business Officer, Web Werks-Iron Mountain



“Logistics-focused real estate firms, which have traditionally invested in industrial real estate, are now eyeing the datacentre industry as an opportunity.”

Ankit Saraiya

Director, Techno Electronic & Engineering Services



WHAT IS DRIVING THE SHIFT?

- **Cost Advantage:** Tier 2 and Tier 3 cities offer lower land costs, reducing operational expenses for datacentre operators.
- **Scalability:** These cities facilitate the scalability of tech services, meeting the rising demand for data-driven solutions.
- **Reduced Real Estate Demand:** Datacentre sector's demand for real estate does not compete with consumer demand, avoiding cost spikes.
- **Proximity to Users:** Locating in these cities brings datacenters closer to users, reducing latency and improving user experience.
- **Supply Chain Strength:** Established supply chains and logistics infrastructure favour the growth of datacenters in these cities.

Explaining the nuance behind availing this cost benefit, Equinix's Paul says, "Availability of suitable land and cost of land does play a role in the selection of a site for a datacentre. But, since the cost of land is one of the elements of total capex spend, other factors like demand for colocation in that city, availability of reliable power and telecom network infrastructure are other key parameters which play a role in site selection."

Agrees, Sanjay Bhutani, Chief Business Officer, AdaniConneX: "Beyond just real estate, datacenter infrastructure demands heightened focus on sustainability and energy security, especially with the rise of AI and development of hyperscale parks across the country."

There is also the aspect of playing to the strengths of established supply chains, which further dictate the spread of this datacentre market growth. Ankit Saraiya, director of Techno Electronic & Engineering Services, says, "Logistics-focused real estate firms, which have traditionally invested in industrial real estate, are now eyeing the datacentre industry as an opportunity for growth. This is because e-commerce giants, which are major players in both logistics and datacentres, have shown the potential for synergistic relationships between the two sectors. This increased interest from logistics real estate firms can further drive the competition and costs in Tier-I markets, leading datacentres to consider Tier-II markets as alternatives."

To facilitate such moves state governments are also rolling out the red carpet. For example, Karnataka provides incentives and exemptions to attract investments of around Rs 10,000 crore, which it hopes will help the state establish a datacentre capacity of over 200 MW by 2025. Uttar Pradesh, where Yotta's hyperscale facility is now located, has unveiled its datacentre policy with a target to attract investments worth Rs 20,000 crore.

WILL THIS CREATE MORE JOBS, THEN?

Well, yes and no. To explain this, Equinix's Paul cites



Driven by a steady growth of adoption of services, as seen in UPI crossing 10 billion transactions per month, India's rising datacentre market has a strong reason to invest in growth.

an internal company survey from this year to state, "People who are essential to day-to-day datacentre operations are fast becoming a scarce resource, as technologies powering these facilities develop at a rapid pace. This shortage will further intensify as 58% of Indian businesses plan to expand to new countries in the next 12 months. As a result, the need for education and collaboration to enable IT teams to optimise the deployment of this infrastructure will rise, driven by data protection, data analysis, cloud computing, and expertise in artificial intelligence and machine learning as the most important roles."

Paul's assessment is on point. The extent of manual operations at a datacentre facility is limited, which means that such facilities may not immediately generate low-value, high-volume and low-skilled employment en masse. Instead, the opportunities that this sector could create will include high-skilled tech resources to work in various nuances. Such a narrative will also lead to the proliferation of tech jobs beyond just the metropolitan hubs.

Techno's Saraiya adds that India must adopt a multifaceted approach to achieve these employment and data processing goals. This approach includes enhancing data collection efforts, ensuring up-to-date and accurate information across various sectors, and investing in advanced data processing and analysis techniques for handling growing data volume and complexity. It also encompasses strengthening data storage and management capabilities, improving data accessibility for policymakers, researchers, and investors in a timely and granular manner, establishing robust data governance frameworks to ensure privacy, security, and ethical use,

and implementing stringent data protection policies with strict penalties.

ARE OUR REGULATIONS READY TO DRAW IN SUCH BUSINESSES?

For the most part, from a regulatory standpoint, the Indian datacentre market has everything set to take flight. A big boost to this arrives in the form of data localisation mandates, despite not being set in stone. The recently passed Digital Personal Data Protection Act, 2023 did not push mandates for localising in India – but offered industry guidance towards how companies should approach storing personal data. In the latter, the government has recommended data storage in geographies apart from those that are blacklisted by the government.

While the upcoming Digital India Act, as well as future amendments to existing regulations, could potentially add further nuance to India's data localisation and protection laws, the industry presently has a strong fillip to boost its capacity building. Driven by a steady growth of adoption of services, as seen in UPI crossing 10 billion transactions per month on 30 August this year, India's rising datacentre market has a strong reason to invest in growth.

This growth, additionally, will only be further driven by both innovations, as well as increasing global regulatory efforts from nations to protect its data. With a similar premise offered to India as well, stakeholders of the entire ecosystem, including those looking for tech jobs beyond the IT and GCC sectors, are likely to see datacentres play bigger roles in the future. 🌐

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“TIER II AND TIER III CITIES OFFER STRATEGIC ADVANTAGE”



ROHAN SHETH

Head – Datacentre & Colocation Services, Yotta

What advantage does an edge datacentre bring in terms of latencies and other operations?

Edge computing serves as a powerful solution for executing operations that demand extremely low latencies and flexible programming runtimes. By processing data closer to the data source, edge computing minimises the delays in data transmission, making it ideal for applications that require real-time responses.

For scenarios where operations have varying durations, the distributed nature of the edge datacentre allows tailored programming and execution time. This flexibility ensures that each operation can be optimised for its specific requirements, avoiding any unnecessary delays while maintaining efficient resource utilisation.

Edge computing's ability to manage extreme latencies and accommodate diverse programming runtimes makes it a valuable tool offering substantial benefits to various industries. We are seeing edge datacentres enabling real-time applications like industrial automation, remote monitoring, or low-latency interactions in gaming and augmented reality. In Industry 4.0, real-time data processing at the edge allows for seamless automation and predictive maintenance and optimising various manufacturing processes. Smart factories also benefit from immediate data analysis, enhancing production line responsiveness and minimising downtime. Additionally, in content delivery, edge datacentres minimise data travel distances, ensuring faster and smoother content delivery, thus enhancing user experiences.

The newly introduced datacentre policy is also expected to expedite the provision of necessary infrastructure and approvals.

Yotta has plans to deliver around 1,000 MW of datacentre capacity across Maharashtra, Gujarat, Tamil Nadu, and Delhi-NCR by 2030.

Does India have enough capacity for its data right now? What scale of increase is required?

The data localisation standards and the government's recently unveiled datacentre strategy, designed to streamline regulations, are attributed to the growing favourability of India among major global datacentre operators. The newly introduced datacentre policy is also expected to expedite the provision of necessary infrastructure and approvals.

Industry reports suggest an evident gap between the existing datacentre capacity in India and the corresponding needs. According to a report by Aventus Capital, the installed datacentre capacity has grown to over 800 MW by the end of 2022. This marks a 48% increase compared to the 540 MW capacity recorded in 2019. With the increasing penetration of 5G enabled phones, combined with a huge appetite for data consumption, India needs to develop 15 times more datacentre capacity to address Digital India's ever-increasing data storage needs.

Recognising the demands and prospects, we combined our in-house expertise in land and power to steadily bridge gaps through expansive hyperscale datacentre parks spanning the entirety of the country. Additionally, we boast a robust pipeline of edge datacentres nationwide, seamlessly complementing our hyperscale facilities. In line with this, Yotta aims to build four datacentre parks across the country over the next five to seven years, as part of our overall plan to bridge the digital divide and make India a USD 1 trillion digital economy. We have planned to deliver around 1000 MW of datacentre capacity across Maharashtra, Gujarat, Tamil Nadu, and Delhi-NCR by 2030.

Does real estate cost also play a role in datacentres shifting to tier-II markets?

Setting up a datacentre involves significant expenditure, with a substantial portion dedicated to real estate acquisition and development, reflecting the crucial

role of physical infrastructure in housing and operating datacentre facilities. As land costs remain comparatively lower across Tier II and Tier III cities, these regions offer a strategic advantage for expanding datacentre infrastructure while optimising operational expenses.

Additionally, state governments are also making considerable efforts to establish smaller edge datacentres near key Tier II cities. Several state administrations have implemented dedicated datacentre policies to harness this potential. For example, Karnataka provides incentives and exemptions to attract investments of around INR 100 billion, aiming to establish a datacentre sector boasting a capacity exceeding 200 MW by 2025. Similarly, Uttar Pradesh has unveiled its datacentre policy, with a target to attract investments worth INR 200 billion. These states exhibit remarkable growth potential and boast abundant land and skilled labour.

What kind of employment potential could such facilities offer?

Edge datacentre facilities have the potential to unlock significant employment opportunities in Tier II and Tier III cities across India. These facilities require both skilled and unskilled workforce for various roles, such as datacentre technicians, network engineers, security personnel, facility managers, and support staff. The establishment, maintenance, and operation of edge datacentres demand a range of technical expertise, including IT infrastructure management, network configuration, and cybersecurity. This creates a demand for locally sourced talent in these cities, contributing to job creation and skill development within the region.

Overall, the development of edge datacentres has the dual advantage of providing enhanced digital services to the people and businesses in these regions while simultaneously driving job growth and skill enhancement among the local population. 🌱

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“DIGITAL WILL SOON BECOME A LIFESTYLE CHOICE”



AMIT AGRAWAL

Chief Business Officer, Web Werks-Iron Mountain

To what extent can edge datacentres impact latencies and various operational aspects?

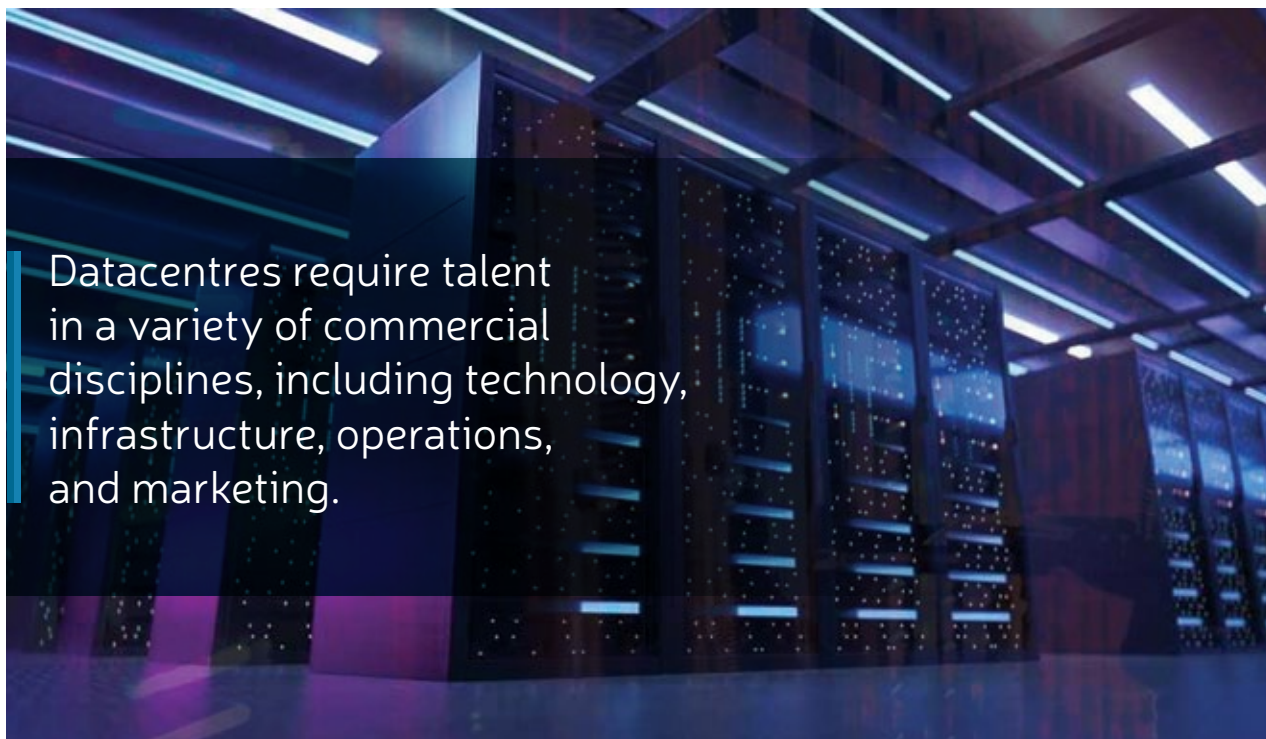
Edge computing is thought to be the future of computing according to Gartner. Datacentre and inter-connectivity of the edge are becoming important as the rate of growth is increasing. Edge DC is efficient in meeting the needs of applications in Artificial Intelligence and Machine Learning, the Internet of Things, and Augmented and Virtual Reality. In addition, small Edge datacentres benefit from the fact that Edge servers exist that can run at elevated temperatures.

Digital will soon become a lifestyle choice, thanks to the burgeoning Indian millennial population. Due to high bandwidth and transmission demands, DCs will need to

be ready to deal with changing latency and workloads. Latency becomes a significant factor as the majority of businesses are migrating their critical data to the cloud. Datacentres need to incorporate hybrid computing architectures. Web Werks is geared to capitalize on hyper-scale and the edge with a strategy that seeks to extend its interconnection advantage. Web Werks offers a network-dense Interconnection Ecosystem comprising all major Telcos, 180+ ISPs, and three major Internet Exchanges in India – NIXI, De-CIX, and Extreme IX – large CDNs and OTT providers.

Enterprises can achieve application performance and user experience by deploying direct, private connections at the DCs. Businesses connect to their customers,

With governments and companies collaborating to enhance data infrastructure, the datacentre capacity will jump from the existing 700 MW to 3 GW in 3-4 years.



Datacentres require talent in a variety of commercial disciplines, including technology, infrastructure, operations, and marketing.

employees and partners inside the datacentres offering an interconnection ecosystem.

What about India's data capacity vis-à-vis the massive adoption of digital technologies across levels?

India's data capacity and infrastructure are expanding due to increased digital adoption. Meeting rising demand driven by online services, smartphones, and Internet usage typically entails investments in datacentres, network equipment, and connectivity. The necessary scale of increase varies based on factors like population growth and technology advancements. With governments and companies collaborating to enhance data infrastructure, the current datacentre capacity of 700 MW will increase to 3 GW in the next 3-4 years.

And how is the cost of real estate influencing the migration of datacentres to tier-II markets?

Real estate costs are a significant factor in the decision to move datacentres to tier-II markets, which are smaller cities with lower real estate expenses compared to major urban centres. This shift can help companies

save on construction and operational costs, as high real estate prices in larger cities can inflate overall expenses. However, the decision also depends on factors such as power availability, connectivity, customer proximity, regulations, and infrastructure.

What employment opportunities could these facilities potentially generate?

Leaders are now teaching recruiters to look outside the typical prospects so that the hiring hierarchy doesn't have to be constantly reorganised. Datacentres require talent in a variety of commercial disciplines, including technology, infrastructure, operations, and marketing. This in turn generates fulfilling employment and chances to learn from other sectors, which may eventually converge. This includes positions like datacentre operations managers, network engineers, computer systems engineers, datacentre electrical specialists, mechanical engineers and more. But companies will also need to hire for non-tech roles to fill customer-facing and ancillary positions. 🧑‍💻

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Fuelling India's growth as a datacentre hub

Interconnectivity technologies are key to creating more computing power and storage, enabling the country to meet its growing data management needs

BY VIKRAM ANAND

Over the last few years, India has solidified its position as a datacentre hub, with several hyper scalers and service providers building new datacentres to address the growing demand for the capacity and the ability to offer a low-latency experience.

The sector is moving from strength to strength with the country's growing data consumption, and the COVID-

19-led digital transformation of enterprises, coupled with increasing cloud adoption, leading to the evolution of the datacentre industry in the country.

Several hyper scalers have recently either set up or expanded datacentre operations in the country. For instance, Microsoft announced its intent to establish its latest datacentre region in Hyderabad, adding to its existing network of three regions in India across Pune,

Cloud is a significant part of the digital transformation of enterprises across all sizes and is one of the key factors fuelling growth.

Indian service providers are already taking steps to deploy innovative DCI to provide a reliable and scalable network connecting users to digital content.



SUMMING UP

- India's datacentre industry is thriving, driven by growing data consumption, digital transformation, and cloud adoption.
- Major hyperscalers like Microsoft and AWS are expanding their datacentre operations in India, investing billions in the country.
- While the datacentre capacity in India is set to double by 2024, the industry revenue is expected to reach USD 1.2 billion.
- There is a rise of edge datacentres in tier 2 and tier 3 cities, fueled by the growing 5G ecosystem and digital demand.
- The need for high-performance datacentre interconnect is critical with India's digital economy continuing to expand rapidly.

Mumbai, and Chennai. Similarly, Amazon Web Services launched its second infrastructure region in Hyderabad last year, with plans to invest an estimated USD 4.4 billion in India by 2030.

According to a recent study by JLL, the country's datacentre capacity is expected to double from 637 MW in H1 2022 to 1318 MW by 2024. The industry is likely to grow from USD 385 million in 2021 to USD 1.2 billion by 2024, says the same JLL report.

As the Indian consumer matures and demands best-in-class digital experience, there has been a significant increase in the number of edge datacentres. India's public sector company, Railtel announced recently that it would be building edge datacentres at 102 locations in tier 2 and tier 3 cities. The Government of Uttar Pradesh has also signed an agreement to build edge datacentres at 750 locations in the state. Service providers are also investing in building a network of edge datacentres. Airtel added a datacentre in East India in 2022 to its existing 12 large and 120 edge facilities across the country. This growth in edge datacentres is also the result of the growing 5G ecosystem in India.

INDIA'S BURGEONING DIGITAL ECONOMY

A key reason for this growth is the country's expanding digital economy. There has been a massive increase in data consumption, with estimates predicting India's mobile data traffic to increase to over 49 gigabytes per subscriber per month in 2027.

The launch of 5G services last year and the growing 5G coverage imply that data consumption is likely to continue growing over the next few years. 5G will also enable several path-breaking and high-bandwidth use cases like Industry 4.0, smart city applications, connected vehicles and remote surgery, further increasing the demand for capacity and low latency to provide a superior customer experience.

The pandemic has also accelerated the digital transformation of enterprises across different industry



DCIs can turn any datacentre into a living organism of scalable performance that can respond to the exploding need for data, without creating a new centre.

verticals. Cloud is a significant part of the digital transformation of enterprises across all sizes and is one of the key factors fuelling growth. The consumption of cloud-based applications and services is only going to increase over the next few years as more and more enterprises adopt a cloud-first or cloud-progressive approach. Overall, the public cloud services market in India is likely to reach USD 17.8 billion by 2027, growing at a CAGR of 23.4% from 2022 to 2027, according to IDC. Government initiatives like Digital India have also contributed to the growth of the datacentre industry in the country.

NEED FOR HIGH-PERFORMANCE DATA CENTRE INTERCONNECT

Cloud-based services have witnessed a massive jump as they allow enterprises to quickly and easily process and acquire insights from the influx of data. However, managing a hybrid and multi-cloud infrastructure is increasingly complex as the influx of data being transported in and out of the cloud continues to grow.

As more and more Indian businesses adopt a multi and hybrid-cloud approach, connectivity requirements are bound to increase and will require best-in-class interconnection. Enterprises are also looking for flexibility and agility in provisioning the bandwidth. Today, businesses need to work with network, colocation, and cloud providers to ensure a high-performing interconnection. Typically, they are required to make a long-term commitment with a higher monthly cost. This is a problem because it is hard to predict how the connectivity requirements will evolve over a period of time.

Datacenter Interconnect or DCI offers a way to create more computing power and storage by allowing service providers to tap into the physical and virtual resources of other datacentres they are interconnected with. Essentially, interconnectivity technologies turn any connected datacentre into a living organism of scalable performance that can respond to the exploding need for data, without having to create a new physical centre. Beyond saving dollars on real estate, electricity and cooling costs, such technologies also ensure greater security, as operators can create network connectivity between their distributed datacentres for disaster recovery. The right DCI platform helps enterprises streamline operations and ensure a world-class customer experience.

India has already established itself as a key datacentre hub. Now with digital transformation moving at breakneck speeds and the continued adoption of the cloud, the India datacentre sector is well on its way to boost this growth momentum. Indian service providers are already taking steps to deploy innovative DCI to provide a reliable and scalable network connecting users to digital content. Datacentres are a pillar of growth for India's digital economy, supporting the surging demands for video, data and cloud-based content and services. 🧑🏻‍💻



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Why India needs a national datacentre certification programme

A standardised strategy can train professionals, bring in more talent, improve the industry eco-system and also make the country an investment destination



BY DR. YOGESH SHETE

India's datacentre market is expected to grow at a CAGR of 12.2% from 2023 to 2028, according to a report by IMARC Group. This growth is being driven by the increasing demand for cloud computing, big data and artificial intelligence in the country.

The Government of India has taken some steps to support the growth of the datacentre industry, such as launching the National Data Centre Policy (NDCP) in 2016

and the Data Centre Scheme in 2019. However, there are still some gaps in the government policy, such as the lack of a national datacentre certification programme.

A national certification programme would help ensure that datacentre professionals have the skills and knowledge they need to work in the industry, which would make India a more attractive destination for investment in the datacentre sector.

A national certification programme would help ensure that datacentre professionals have the skills and knowledge they need to work in the industry.

There is a shortage of qualified datacentre professionals in India. A national certification programme can provide a pathway to get the training they need.



IN SUMMARY

- India's datacentre market is poised to grow at a CAGR of 12.2% from 2023 to 2028.
- There are government initiatives to support datacentre industry growth in India, but certification gaps remain.
- A national datacentre certification programme would enhance security and address skill shortages.
- High training costs and low industry awareness hinder workforce development.
- India can learn and benefit from programmes offered by countries like China, Singapore, the UK and USA.
- A national certification programme aligns with the vision of a more secure and robust datacentre ecosystem in India.

There are several reasons why India needs a national datacentre certification programme. First, there have been several high-profile data breaches in India in recent years. These breaches have highlighted the need for better security in datacentres. For example, in 2017, the Indian Meteorological Department (IMD) erroneously exposed the personal data of millions of Indians. The breach was reportedly caused by a lack of security measures at the IMD's datacentre. Similarly, a breach at the Indian Railways datacentre revealed passenger information, and this was attributed to unqualified datacentre professionals who lacked training. A national certification programme would help to ensure that datacentres in India meet high standards of security.

Second, there is a shortage of qualified datacentre professionals in India. A national certification programme would help address this shortage by providing a pathway for professionals to get the training they need.

Third, the cost of datacentre training can be high, which can make it difficult for people from low-income backgrounds to get the training they need. A national datacentre certification programme could help make training more affordable by providing financial assistance to qualified candidates.

Finally, there is a lack of awareness of the datacentre industry in India. This can make it difficult for people to know about the opportunities in the industry. A national datacentre certification programme could help raise awareness of the industry by promoting it through government channels.

The Government of India too can take several steps to create a national datacentre certification programme.

Such a programme would help to address three key challenges.

Lack of skilled datacentre professionals: The Indian datacentre industry is expected to create 1.5 million jobs by 2025. However, there is a shortage of skilled datacentre professionals in India. A national certification programme would help ensure that datacentre professionals have the skills and knowledge they need to work in the industry.



India can follow the example of China, Singapore, China, the UK and USA to create a certification programme. It would benefit the industry as well as the economy.

Inadequate standards for datacentre design and operation: There are no mandatory standards for datacentre design and operation in India. This can lead to datacentre failures, which can have a negative impact on businesses and organisations. A national certification programme would help set standards for datacentre design and operation, which would improve the quality and reliability of datacentres in India.

Lack of awareness of the datacentre industry: Only 1% of students in India are interested in a career in the datacentre industry, according to a NASSCOM report. This demonstrates the lack of awareness of the datacentre industry in India and makes it difficult for people to learn about the opportunities in the industry.

Here are four examples of the countries that have such certification programmes and the benefits they have seen as a result:

#1

The USA: The Data Center Certification and Accreditation Programme (DCAAP) has helped ensure that datacentre professionals in the US have the necessary skills and knowledge. This has made it a more attractive destination for investment in the datacentre industry.

#2

Singapore: The BCA-IMDA Green Mark scheme has helped raise the standards of datacentre design and operation in the city-state. No wonder Singapore

has emerged as an attractive destination for datacentre businesses.

#3

China: The China Data Centre Certification (CDC) has helped ensure the quality and safety of datacentres in that country. This has helped China attract new businesses in this industry.

#4

The UK: The British Standards Institution (BSI) Kitemark sets standards for the security and reliability of datacentres. India can follow the examples of these countries and create a national datacentre certification programme. This would benefit not only the industry but also the Indian economy.

The vision of a national datacentre policy is to create a more secure, reliable and sustainable datacentre ecosystem in India. The industry is a rapidly growing sector in India, and it has the potential to create millions of jobs and boost the economy. However, the industry faces some challenges, and the lack of a certification programme is one of them. Such a programme would help to address these challenges and also bring more investments in this industry in India. 🇮🇳

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Two sides of the story

Their dispute over revenue split is a cliffhanger that continues season after season. A look at the issues at stake and possible happy endings



BY PRATIMA HARIGUNANI

The debate between telecom companies and OTT players keeps brewing over and over. Even when data consumption is exploding – and will break the roof when 5G arrives.

Telcos have, on some occasions, suggested a revenue-sharing model – something like a usage charge for the traffic that OTT players carry on the networks of telcos. Their argument is simple: You generate this money because of the networks we have built, so we deserve a slice. After all, the ‘same service, same rules’ model applies when OTT platforms also allow a bundle of services, such as voice calling, video calling and communication avenues. But only telcos bear the weight of fees, licences, and other infrastructure investments.

Things are not that simple. Walk a bit to the other side and the argument made by OTT players holds some water too. If it were not for what OTT platforms offer, telcos

would not enjoy all the sky-kissing data consumption that they see now.

Quite a conundrum. But one that telcos cannot put on the back-burner for long, especially when their average revenue per user (ARPU) has been suffering a lot of pressure in recent times. All the ARPUs have shown a dip between the June 2013 quarter and the December 2022 quarter, as per the TRAI paper. ARPU rose only about 41%, from Rs 123.77 to Rs 146.96, during that period. The share of revenue calls also slipped to Rs 14.79 or 10.1% in ARPU of Rs 146.96, from Rs 72.53 or 58.6% in that period. Not just that, revenue share from SMS declined from Rs 3.99 or 3.22% of ARPU to 23 paise or 20%.

IN THE PREVIOUS SEASON

Let us first understand the two sides with more clarity on where they are coming from. As Sudhir Kunder,



“The regulations must be based on the nature of functions performed and services provided. A square peg in a round hole will stifle innovation.”

Purushotham Kittane
Technology Lawyer, Nishith Desai Associates

Country Director, DE-CIX India, dissects it, the discourse surrounding the request made by telcos for tech players to bear a portion of the expenses related to content delivery and data is multifaceted, encompassing issues of net neutrality, equitable competition, and the sharing of costs.

These discussions have been brought into the mainstream discourse for several years now, observes

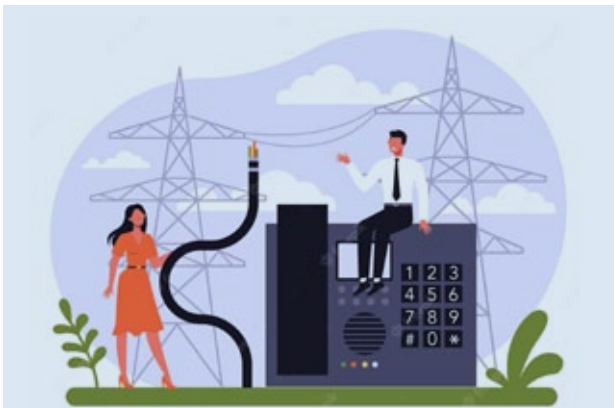
Purushotham Kittane, Technology Lawyer, Nishith Desai Associates. “TRAI had as early as 2015 considered in a consultation paper whether to regulate OTT services within a licensing framework. While the discourse then was a carriage vs. content debate, it is now a debate of OTT apps replacing functionalities of traditional telecom services. The telecom industry’s case is that it is already affected, taking a hit in revenues over the years while still paying licence fees, which the OTT players donot. The OTT industry feels a licensing framework is unfair as they should not pay licence fees for infrastructure the telecom service provider operates.”

Advocates of telcos charging tech players for content delivery and data argue that telcos invest significant resources in building and maintaining the communication infrastructure, such as fibre optic cables, cell towers, and datacentres, explains Nitin Singhal, Managing Director, Sinch India. “They argue that tech players benefit from using these well-established networks and should contribute to their upkeep. Also, data-heavy content and services from tech players can contribute to network congestion. By charging tech players, telcos can manage network traffic and ensure quality of service for all users.”

There is more to the story. This issue is quite fragile given its natural collision with the net neutrality debate as well.

“Charging tech players can also prevent an unfair advantage for large content providers, ensuring smaller content providers can compete on an equal footing. On the other hand, charging tech players for content delivery and data could violate the principles of net neutrality, which advocates for equal treatment of all Internet traffic. Net neutrality argues that ISPs should not discriminate against different types of data or content providers,” Singhal reasons.

Sourav Gupta, Telecom Analyst at Omdia, says that it will be an ongoing competition until the regulator of



THE TELCO POV

- Telcos invested heavily in network infrastructure
- They argue OTT platforms benefit from this infrastructure
- Telcos seek a share of OTT revenues as compensation
- Declining ARPU adds urgency to revenue-sharing demands
- Telcos aim to manage network congestion and ensure quality
- Potential benefits include fair competition and network sustainability

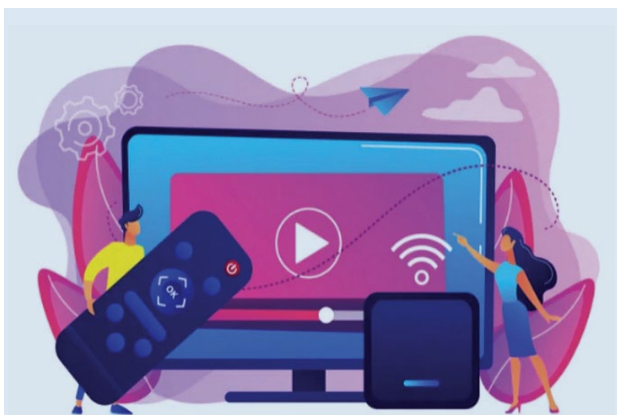


“Charging tech players can also prevent an unfair advantage for large content providers, ensuring smaller content providers can compete on an equal footing.”

Nitin Singhal

Managing Director, Sinch India

the country steps in with any kind of regulations for the OTT players. “Currently in India, TRAI is working on the consultation process and carrying out comparative studies on how OTTs are regulated in other countries. One of the models being discussed is a revenue-sharing mechanism between OTTs and telcos. Video consumption comprises 70% of the overall traffic flow on telecom networks, and this would grow further with 5G services. Similarly, telcos would have to increase their spending on carriage capacity and backhaul networks, which entails investments.”



THE OTT STORY

- OTT platforms claim they’ve driven telco data consumption
- They argue licensing fees for infrastructure are unfair
- Concerns about violating net neutrality principles
- Worries about increased costs for consumers
- Fear of stifling innovation and smaller player entry
- Belief in a symbiotic relationship with telcos

The Cellular Operators Association of India (COAI) had suggested levying a usage charge for actual traffic carried by OTT on telecom networks. The usage charge would be a mutual decision between OTT players and telecom service providers. Furthermore, OTT players must contribute towards developing and creating digital telecom infrastructure in India in exchange for using the services.

Telcos already charge their customers for data usage and Internet access, experts note. Adding charges to tech players might increase costs for consumers, leading to potential backlash and dissatisfaction. Imposing fees on tech players could also stifle innovation and limit the entry of new smaller players into the market. Tech players also bring value to telcos by driving demand for high-speed Internet and data services. A symbiotic relationship exists, where both parties benefit from each other’s offerings.

Roslyn Layton, VP Roslyn Layton, Strand Consult, brings an avid gaze about the importance of broadband to transform India’s economy, drive its IT industry and enable leadership. She has worked for TCS Innovation Labs Hyderabad and attests to the gravity of this whole debate. “Globally, there is a USD 2 trillion shortfall in broadband network investment. Over half of the world is offline for the reasons of lack of affordability. The UN Broadband Commission recognised in 2021 that the largest global OTTs need to be incorporated financially into business models for network rollout to the end user in a rational, predictable, transparent, and sustainable way. Finding solutions for India is worth tens of millions of dollars and will help millions of people get online.”

Layton also tries to bring some attention back to the arguments that Big Tech uses globally to say that these models are “harmful”. “Alphabet, Amazon, Meta, Netflix, Apple and others organise collectively to lobby against governments’ exploration of these models. They use reports by Analysys Mason and the lobbying arm of the CCIA and Incompas. However, Strand Consult has debunked these reports and arguments. The UN also



“TRAI is working on the consultation process and carrying out comparative studies on how OTTs are regulated in other countries.”

Sourav Gupta

Telecom Analyst, Omdia

rejects these views. In the USA, Commissioner Brendan Carr of the Federal Communications Commission has called for ending Big Tech’s Free Ride. Moreover, there is bipartisan support in the US Congress to bring OTTs into a cost recovery scheme.”

The debate has no relationship to net neutrality, according to Layton. “Net neutrality is about the broadband provider and the end user. Cost recovery is about the broadband provider and the OTT. Under this scheme, there is no blocking, throttling or prioritisation of traffic. Cost recovery enables the free and open Internet because it reduces the cost burden on consumers and makes networks more affordable and accessible.”

She further adds that the country with the most robust regime, South Korea, is rated the world’s top broadband market for the highest percentage of next-generation rollout of broadband (fibre and 5G). “South Korea is the world’s seventh-largest content producer and competes globally with its OTTs. Moreover, Google and Netflix booked record profits in South Korea at the same time as they paid network usage fees. Simply put, if you have faster networks, there are more opportunities to show ads and sell movies.”

VIEW FROM THE OTHER SCREEN

While telcos have a lot of reasons to worry about the way the cake is cut now, there are many reasons that OTT and Big Tech players also insist on. Like how they help telcos in cost recovery or increased data demand or how the models they suggest are fair and square.

Interestingly, the Strand Consult’s new report ‘Fact Check on Analysys Mason’s Claims on Big Tech Investments and Arguments against Broadband Cost Recovery’ reviews the claims made by Analysys Mason in its 2022 report, ‘The impact of tech companies’ network investment on the economics of broadband ISPs’. Ask Layton about how Analysys Mason’s claims about the level of Internet infrastructure investment by

edge providers appear credible and consistent with the size and scale of the leading Internet giants (called “edge providers” in the US parlance), and she talks of how these numbers come from that agency’s calculations.

“Moreover, the type, purpose, level, regulatory treatment and location of the infrastructure investments in the comparisons do not cohere. Plus, these investments largely reflect the requirements and profit-driven decisions of edge providers for their businesses and ‘direct investment in their infrastructure’. By contrast, broadband providers as a class invest far more in the Internet infrastructure to connect end users to the Internet than both in nominal amounts and as a percentage of their revenue, compared to Analysys Mason’s figures of edge providers. The investment by Internet giants on infrastructure amounts to 1% of their revenue.”

Parveen Mittal, Vice President and General Manager, Celigo, reflects on how telcos, especially in Europe, are lobbying with regulators to get a policy that makes Internet companies, including social media which send traffic over their networks, pay for the infrastructure used.

“Telcos are spending billions on laying cables and installing towers to meet increasing data demand necessitated by increasing consumption of online content. Telcos reason that if Google and Apple can charge a cut of sales in their app stores, why can telecom service providers get a similar cut? Tech players reason that any service-provider-specific payment affects net neutrality and, in any case, telcos get paid by the customer for the data services used.”

However, given that tech companies have benefitted disproportionately from the increased data usage, as is evident in the relative market capitalisation of tech companies and telcos, a strong case can be made for the former to pay for the traffic generated, Mittal reasons. “Even in India, social media, e-commerce and fintech companies are much higher valued than telcos.”

Listen to how Layton slices the problem. “Strand Consult’s microeconomic analysis of 50 rural US FTTH providers demonstrates that broadband providers have increasing costs from growing video streaming entertainment traffic. Not only can rural broadband providers not recover costs, but they have no data exchange relationships with Big Tech giants anyway, and their attempts to negotiate fall on deaf ears. Few, if any, broadband providers have been able to raise prices meaningfully in the face of growing costs.”

She strongly reckons that even if policymakers believe that Big Tech has no obligation to pay or negotiate for the use of broadband providers’ networks (as Netflix has argued in a South Korean court), there is still a valid case for Internet giants to support universal service obligations and affordable connectivity programs which provide vouchers and broadband subsidies directly to end users. “If Big Tech wants

accolades as infrastructure providers, they should also shoulder the burdens.”

The challenge is that the “pipes” are priced uniformly for end users (this makes them more expensive for the poor), but the usage of the pipes is highly disproportionately consumed by video and advertising data, Layton adds. “Moreover, the social and private values of the services are not equal. Hence the pricing model needs to evolve. There are also issues of competition, regulation, and market entry for services which are presently dominated by platforms.”

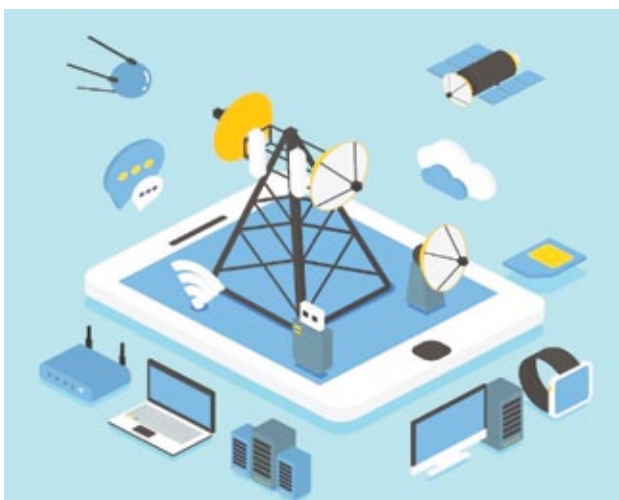
SKIP THE ‘POPCORN SCENE’ PLEASE

Answers have to come. And they can have a different narrative than the one we are used to.

Layton offers some solution ideas. “Broadband cost recovery is the process to enable design and implementation of these models with the following steps: accounting, accessibility, affordability, augmentation. There are at least five models of broadband cost recovery: market-based (e.g., usage fees in South Korea), regulated (the proposed Universal Service Fee as in the USA, the existing Affordable Connectivity Program), technological (e.g., multicasting), philanthropic (grants, donations) and financial (bank loans). The upside for society is to make broadband networks more affordable and available with contributions from OTTs whether to governments, clearing houses, operators, end users or other actors. Significantly, we can also see how Australia and Canada have proceeded with a News Media Bargaining Code and received some AUD 200 million in fees for Google and Facebook. This covers 20% of journalists’ salaries in Australia.”

Many alternatives are possible. What is important to remember is that achieving a harmonious equilibrium that is mutually advantageous to all parties involved and guarantees the long-term viability of the ecosystem will be of utmost importance, Kunder stresses. “The establishment of open and transparent communication channels, as well as the engagement in negotiations characterised by transparency, are of utmost importance to identify mutually advantageous resolutions that facilitate the expansion of digital services, while simultaneously upholding a just and equitable environment for all parties involved.”

According to Gupta, plausible solutions include telcos bundling their services with OTT, telcos developing their own OTT platforms, and telcos just partnering with established and highly demanded OTT platforms having



SOLVING THE STALEMATE

- Universal fixed fee
- Revenue sharing
- Market-based cost recovery
- Telcos with their content bundles
- OTT with their infrastructure
- Telcos as resellers of OTT bundles
- Telcos using content as an acquisition tool
- Telcos adopting MVNO and asset-light models
- Telcos-OTT partnership for a win-win business



“If Big Tech wants accolades as infrastructure providers, they should also shoulder the burdens.”

Roslyn Layton

VP Roslyn Layton, Strand Consult

a good customer base. Telcos would be able to make profits from the heavy traffic such OTT platforms attract and may do so by improving the broadband package plans for customers.

Telcos should, of course, be seeking tech companies to share some revenue with them for content and data delivery. However, the question of whether telcos should ask tech players to pay some of the cost of content delivery and data is a complex and debated issue. Different stakeholders hold various perspectives on this matter, and the answer depends on the specific context, regulations, and market dynamics.

In Kittane’s opinion, there is a middle ground although it is industry-led and not regulator-led. “The ITU had suggested in 2020 that OTT providers could enter into voluntary commercial arrangements with telecom service providers. These arrangements can allow OTT providers to invest in Internet infrastructure without falling under the licensing requirement.”

It is interesting how this issue could impact branding and advertising, notes Gaurav Gulati, a seasoned advertising expert and branding consultant.

“This partnership could change how companies talk about themselves and their ads. For example, they might say, ‘We work together to make your videos load faster and your apps work better.’ This could show how they are a strong team, focusing on a better experience for you.”

But if this model becomes a reality, Gulati cautions that tech companies might need to change their branding strategies to highlight their value to users and telcos. “They could emphasise how their services contribute positively to the network ecosystem and user experience. Just as a McDonald’s burger finds its perfect companion in a refreshing Coke, the Netflix experience shines with Vodafone. Telecom and tech unite, spotlighting mutual strengths.”

Layton discounts the question that this debate might not matter five years from now, when hyperscalers, satellite Internet, decentralised networks and so on might have become a reality. “Yes, it will matter.” She maintains her concerns. “India must still evolve from 2G to 5G. Today there is limited revenue to make those infrastructure investments. Many locations in India will also roll out fibre. Those networks will not be built if it is expected that 100% be covered by end users. OTTs which get the benefit of the networks must also contribute to the building of the networks to the end users. Satellite Internet also faces the same cost challenges and will want to access cost recovery models.”

As for software-defined networks and so forth, she remarks that these are not one-to-one substitutes for hardware: the actual servers, routers, wires, base stations, towers, antennas and so on are needed to deliver data. That is, software only comes into play once the 5G network is installed. There is no shortcut for the purchase of spectrum licences, towers and base stations.

Eventually, the decision to charge tech players for content delivery and data is a policy matter that involves balancing the interests of various stakeholders, Singhal sums up. “Governments and regulatory bodies often play a role in determining the rules and regulations on these types of practices to ensure a fair and competitive digital ecosystem.”

Kittane agrees, and adds, “Ultimately, consumer demand gives direction to how either of these service providers function and the regulations also should evolve keeping that in mind. These regulations must be based on the nature of functions performed and services provided. A square peg in a round hole will stifle innovation.”

He has a word of advice for telcos too. “They are into enabling voice and data requirement of the businesses and users and telcos need to clear their positioning in the market. They need to focus more to improve on user



“Telcos need to continuously educate consumers as well as regulatory bodies and policymakers to build their case.”

Parveen Mittal

Vice President & General Manager, Celigo

experience by providing best-in-class networks for each user at every location in the country. This will increase their pie chart on usage of the network and can have more innovative commercial models basis the same. We should not try to take share from the content producer and go on the path of impacting the creativity.”

Indeed. This debate is not a negotiation table-stop but a wake-up call for telcos to make that big ‘pivot’. According to a report by Straits Research, the global OTT market size was at USD 276.02 billion in 2021 and would be USD 2838 billion by 2030, with Asia Pacific as the fastest-growing market. It is time for telcos to look beyond low-hanging fruits. A 2022 KPMG report, titled ‘Future of Telco’, pointed out that when we look at the factors that have the greatest potential to change the landscape for the telecommunications industry, we see the development of revenue-generating solutions that exceed the cost of network upgrades at the top (29%) followed by funding for network upgrades and modernisation (at 23%).

Telcos that can flip the script would be the ones to enjoy a new negotiation advantage at the tables that will emerge in future.

The KPMG report also showed that compared with followers, future-focused telcos are 2.5x more likely to develop compelling customer value propositions on price, products and services to engage some of the most attractive customers and drive profitable growth. They are also 3.1x more likely to engage, integrate and manage third parties to help increase speed-to-market, reduce costs, mitigate risk and close capability gaps to deliver on the customer promise. And 4x more likely to harness data, advanced analytics and actionable insights with a real-time understanding of the customer and the business to shape integrated business decisions.

The report also explains how today’s market conditions are creating challenging times for telco players. It states – Traditionally, telcos have made their money by moving

bits through the air and across wires in their networks. And while doing so is still central to their mission, telcos need to figure out ways to diversify and make their businesses more profitable, because continually investing in infrastructure can limit profitability.

Meanwhile, the OTT revenue dead-end can, hopefully, be addressed through a regulatory GPS. And if not, telcos can find a new and bigger highway they would not have to fight upon.

“I believe that it is finally a policy decision to find a fair and balanced approach that is essential to ensure a sustainable and equitable Internet ecosystem,” Mittal says. “Telcos need to continuously educate consumers as well as regulatory bodies and policymakers to build their case.”

Regulatory consultation papers have been in progress, not just in India but in a global arena like GSMA and EU too, but we need more clarity and more action – and sooner rather than later.

Gupta surmises that the OTT-telco revenue debate will not end till the telecom watchdog comes up with any regulation model for OTTs or a revision in tariffs is made.

Overall, as Gulati sees it, the telco-OTT debate can shape branding and advertising strategies by fostering collaboration between telecom and tech companies. “This collaborative approach could emphasise the mutual value they bring to each other’s services, highlighting telecom companies as reliable content delivery platforms and tech companies as innovative creators. Additionally, it could lead to campaigns emphasising enhanced user experiences, innovations resulting from collaboration, transparency in cost-sharing and data usage and alignment with privacy-focused messaging to build consumer trust.” 🍌

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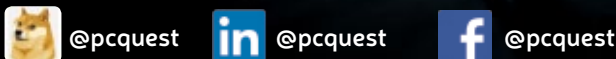
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Painted in uncertain strokes

India's Digital Personal Data Protection Act, 2023, adopted in August, leaves a lot of room for criticism. Here are some key concerns



BY VERNIKA AWAL

On 3 August, India noted a landmark moment in its regulatory history, with the Digital Personal Data Protection (DPDP) Bill (now Act) being introduced in Parliament for the very first time. The now-law was tabled at the final step of India's judicial and regulatory process after five years of conversations, consultations and cancellations of the Bill, and finally adopted as a law.

However, despite the Act being okayed in Parliament quite promptly, and subsequently being adopted into law after President Draupadi Murmu gave her assent to it on 11 August, industry stakeholders and experts have highlighted several concerns and challenges. These relate to how the DPDP Act lays down regulations, and also how it defines personal data and its use. These concerns are unlikely to be alleviated any time soon but they bring

While the DPDP Act seeks to establish user data privacy, it is centred around what enterprises are allowed to do with the personal data that they collect.

The new law allows companies to scrape social media data using automated algorithms to collect and store any information posted by users themselves.



SHADES OF GREY

- **Data protection vs. data processing:** Concerns arise as India's DPDP Act prioritises enabling data processing over user data protection.
- **Ambiguous social media data rules:** Section 3(ii)(A) raises concerns as it allows the scraping of publicly shared social media data without consent, impacting personal privacy.
- **Operational challenges:** Companies, especially in AI, face challenges in distinguishing between first-party and third-party social media posts, complicating data collection processes.
- **Lack of clarity:** Lack of clarity in the DPDP Act regarding Data Protection Board operations and data retention periods raises uncertainty for businesses.
- **Government exemptions:** Concerns about broad exemptions for government access to user data without clear safeguards or recourse mechanisms under Section 10.

forth several key points that may be important to know, from the standpoint of data owners in the country.

PROCESSING, NOT PRIVACY

The first and foremost concern, as highlighted by numerous policy consultants, is how the Act is phrased. While the DPDP Act refers to the 'protection' of personal data, industry stakeholders were quick to highlight that the entire law is framed around enabling access to and processing of personal data by companies and not the other way round.

In simpler terms, while the DPDP Act seeks to establish user data privacy, it is centred around what enterprises are allowed to do with the personal data that they collect. This, as per experts, is the first step towards the fact that the DPDP Act reduces the role of data privacy to exemption-based outcomes while offering a broader regulatory structure under which companies can continue to draw personal data, based on their own business needs.

AMBIGUOUS SOCIAL MEDIA DATA SCRAPING

One major area of concern is Section 3(ii)(A), which states that data protection will not apply to "personal data that is made or caused to be made publicly available by the data principal to whom such personal data relates."

In simpler words, if you put your personal data on any social media platform, India's data protection safeguard will no longer apply to you, and companies will be free to scrape this data as public information. This particular clause falls under "legitimate usage", an area of the law that was previously called "deemed consent".

The move has drawn criticism from various corners of the privacy community, with even its safeguard drawing criticism. The latter says that personal data privacy will only be honoured if the said information is being posted by a third party.

In simple terms, most social media content belonging to any user is typically generated by the users themselves, and any third-party post mostly always relates to making reposts of first-party posts – thereby making this safeguard questionable.



The Act exempts government bodies in terms of how they can ask companies to furnish user data but has no recourse mechanism for businesses.

OPERATIONAL CHALLENGES FOR COMPANIES?

The above issue could also pose a major challenge for companies in terms of creating a mechanism to differentiate between first-party and third-party posts on social media. Industry stakeholders believe that companies, especially social media firms, may need to figure out a tech operations policy to segregate the types of data that they collect.

While companies will be required to establish a consent procurement mechanism, such a fine detail could pose a challenge, especially for the nascent field of generative AI. The latter is based on AI models that are based on data taken off public forums of the internet, wherein companies treat any data posted on any social media platform to be public information.

With the new DPDP Act, the process of collecting this data will change. As per the law, companies scraping social media data using automated algorithms will be able to collect and store any information posted by users themselves but will need to separately seek consent from the primary user for a post that may have been reposted by their acquaintance.

Industry experts believe that such a process could make matters complicated for companies, although the government has not offered clarity in terms of how this may be implemented.

This factor, as a result, could lead to making generative AI operations more complex, especially for low-resource academic institutions working on research models.

LACK OF CLARITY SO FAR

Another key area of concern is the absence of intimations and clarifications in terms of how specific operations of

the Data Protection Board will be carried out. While the latter is expected at an upcoming date, other key areas that have lacked clarity include the open clause that leaves the law ready to be amended and tweaked with future rules, without giving clarity on how and when may such changes be made.

Industry stakeholders have also added that in many cases, the DPDP Act specifies that the personal data of users can be retained for a length of time as specified by respective laws of a certain genre. However, lawyers point out that most regulations, including criminal and civil law, do not mention how long personal data should be stored. This may leave companies without a clear idea in terms of how long they may be required to store a certain piece of information.

BROAD-BRUSHED GOVERNMENT EXEMPTIONS

One of the biggest concerns of the Act has come in the form of exemptions that have been offered to government bodies in terms of how they can ask companies under this law to furnish user data. Privacy evangelists underlined that the lack of safeguards of what a company can do to furnish information about a specific user raises concerns about the DPDP Act's ranking alongside top privacy regulations around the world, such as those in Europe and Singapore.

In simpler words, if the government, under Section 10, asks a company to furnish personal data citing a reason that includes "impact on the sovereignty and integrity of India, risk to electoral democracy, security of the State, and public order", companies do not have any mentioned recourse mechanism to seek under law. 🙄

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Does India's new privacy law put generative AI at risk?

Under the new DPDP Act, collecting personal user data from the Internet, a fundamental aspect of generative AI, may prove to be challenging



BY VERNIKA AWAL

When OpenAI popularised ChatGPT at the end of last year, it took a while to realise that the trade-off to getting a human-like chatbot lay in the amount of data that it gobbled up. A lot of this data, which has been collected by numerous entities including the likes of OpenAI, Microsoft and Google over time, comes from the lack of clear regulations on data protection and privacy around the world. But, last month, India introduced its Digital Personal Data Protection (DPDP) Act, and while it is far from the perfect data protection law, it does introduce a layer that could make matters tricky for stakeholders of the generative AI industry.

DO GENERATIVE AI COLLECT SO MUCH DATA?

In a nutshell, yes. The core technology behind generative AI lies in what is known as the transformer model, a form of artificial intelligence invented by a team of Google researchers back in 2017. The idea that a transformer model works on is to consume massive amounts of data to understand how humans create sentences and react to various phrases – in short, understand how they hold conversations.

These models, known as large language models (LLMs), are as a result exposed to a vast amount of data – the more, the merrier – to let it see the widest



“Any breach of what is permitted under the DPDP Act is likely to attract all clauses of penalties and strictures that a data fiduciary will be exposed to.”

Kirti Mahapatra

Partner, Shardul Amarchand Mangaldas & Co.

possible variety of human conversations. This has helped it learn to speak and respond like a human, thus being able to ‘generate’ human-like responses. Hence, the term ‘generative’ AI.

For all of these to work, it is fundamental to collect all data. Historically, the collection of such data has so far been possible in a near-unchecked manner because of the lack of stringent data regulations in most parts of the world. However, this is gradually changing, with major geographies such as the European Union, Singapore, the USA, and now, India implementing data regulations.

DPDP ACT AND GENERATIVE AI

To be sure, the DPDP Act does not mention generative AI explicitly or specifically, and instead speaks about the collection or scraping of personal data from social media platforms. However, this scraping of data is an important clause, since it enables the fundamental idea behind generative AI.

According to Section 3 of the DPDP Act, companies will be required to establish a consent procurement mechanism if they are collecting personal data of users that have not been posted by users themselves. In other words, while companies will be able to deem a user’s self-posted information on social media as consent for data collection if the same is posted by another person, companies will have to find a way to seek individual consent.

This is confusing and complicated, and also potentially expensive. The fundamental idea of collecting data at scale is to optimise the cost of finding data to train AI models on. With such a law, companies will need to create a mechanism to identify first-party data posts against third-party posts and differentiate between the two. They will then be required to enable a consent mechanism for the third-party posts while ensuring that there is no duplication of the same personal information between the two lots to ensure that companies are compliant and are not subject to litigations at any point.

WHAT DO LEGAL EXPERTS SAY?

Legal experts agree with the premise of difficulty that the DPDP Act introduces to generative AI in India. Kirti Mahapatra, Partner, Shardul Amarchand Mangaldas & Co., says, “Under the Indian digital personal data protection law, businesses processing digital personal data in India or elsewhere will face a significant impact. Entities developing and offering generative AI models will have to take into account the fact that if their AI solutions rely on personal data originating in India and it is used to offer goods and services in the country, they will be treated as ‘data fiduciaries’ under the Act.”

In simpler terms, any breach of what is permitted under the Act is likely to attract all clauses of penalties and strictures that a data fiduciary will be exposed to. As Mahapatra adds, “Non-compliance with the Act will not only attract substantial monetary penalties, it may also now impact business continuity in India.”

WILL INDIA REGULATE AI EVEN FURTHER?

An initial statement from Union IT Minister Ashwini Vaishnaw said that the Centre is not looking at regulating AI in any form to preserve innovation and progress of the technology. However, in July, during the ongoing consultative process of the upcoming Digital India Act regulation, Rajeev Chandrasekhar, Union Minister of State for Electronics and IT, said that the Centre will consider some form of AI regulation to safeguard users from “harm” due to AI.

In the recently concluded B20 India summit, top officials and executives that included G20 sherpa Amitabh Kant, Microsoft president Brad Smith, Adobe chief Shantanu Narayen and IBM chief Arvind Krishna, all spoke about the need to regulate AI to foster responsible and ethical development. The top experts also spoke about the need for major economies, including India, to regulate AI from bias, and personal data is likely to play a major role in it. 🧠

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Navigating the critical infrastructure data challenges

AI promises to transform asset management in the telecom, security, and safety solutions across the energy sector



BY KEDAR WARANG

In an era of rapid technological progress, the energy sector's telecom, security, and safety systems produce large volumes of intricate data. This critical national infrastructure (CNI) data has immense potential. However, the complexity and sheer volume of CNI data often hinder organisations from deriving valuable insights and making informed decisions. Artificial Intelligence (AI) emerges as a robust solution, introducing a novel approach to data management, especially in the context of lifecycle management.

AI FOR ASSET LIFECYCLE MANAGEMENT

AI promises to transform asset management in the telecom, security, and safety solutions of the energy CNI. By harnessing AI algorithms and Machine Learning (ML),

organisations can automate data processing, analysis, and decision-making, identifying patterns and anomalies, and predicting future trends to proactively address issues and optimise operations.

One of the key advantages of AI in asset management is its ability to handle large volumes of data in real-time. AI algorithms can process and analyse data at a speed and scale that is beyond human capabilities. For example, within a captive telecom network, an AI system could monitor and analyse countless internal data exchanges and communication events.

It could identify potential system lags or faults in real time, thus enabling swift resolution. This rapid detection

Manually sorting through thousands of alerts from a telecom network to identify critical issues is time-consuming and prone to human errors.

and problem-solving mechanism aids in maintaining the network's uptime, ensuring uninterrupted internal communication and operational efficiency.

Additionally, AI can increase the accuracy and dependability of existing security and safety systems within the energy sector. By automating the analysis of data from these systems, AI reduces the risk of human error and bias. For example, an AI-powered system could be applied to existing security infrastructure, such as surveillance cameras and access control systems at an energy facility. It could analyse this security data to recognise patterns, detect anomalies, and predict potential security threats, enabling a more proactive approach to asset security management.

Similarly, for safety systems, AI could analyse data from various sensors monitoring equipment conditions and operational parameters. By identifying patterns in this data, AI can predict potential safety issues or equipment failures before they occur. This enhances overall asset safety and allows for more efficient maintenance scheduling and potential risk mitigation, leading to safer, more reliable operations.

WHY AI-DRIVEN SOLUTION MATTERS?

Implementing AI-driven lifecycle management solutions brings numerous benefits to organisations, including efficiency and focus, and better maintenance, resource optimisation, and risk mitigation.

Efficiency and focus: AI-driven lifecycle management solutions automate and streamline various processes, such as data collection, analysis, and decision-making. This reduces manual effort and increases operational efficiency, allowing organisations to allocate their resources effectively and focus on strategic initiatives.

Proactive maintenance: One of the key strengths of AI lies in its ability to analyse historical data and identify patterns. By applying this to asset management, AI can predict equipment failures and maintenance needs before they turn into costly repairs or hazardous incidents.

This means that organisations can schedule maintenance activities ahead of time, minimising the downtime of equipment and ensuring optimal

performance. This predictive approach enhances safety and extends the assets' lifecycle, providing significant cost savings.

Resource optimisation: AI algorithms can analyse vast amounts of data from diverse sources and identify the most efficient use of resources. Whether it is determining the optimal staffing levels for a particular operation, choosing the best utilisation of equipment, or even allocating materials most cost-effectively, AI can make these decisions based on real-time data.

The result is a more efficient operation where resources are used effectively, minimising costs and boosting overall productivity.

Enhanced risk mitigation: AI-driven lifecycle management solutions can provide real-time insights into potential risks and vulnerabilities. By continuously monitoring data and identifying patterns, these systems can alert organisations to issues before they become significant problems.

This can help organisations to proactively address risks and can greatly enhance the security and safety of operations, protecting both the employees and the integrity of the facilities.

Informed decision-making: Finally, AI empowers organisations to make data-driven decisions. AI algorithms can deliver accurate and timely insights, giving decision-makers the information, they need when they need it. Rather than relying on gut instincts or outdated reports, leaders can make strategic decisions based on real-time data, leading to better outcomes and improved operational performance.

However, the benefits do not come without the challenges these systems encounter.

CHALLENGES IN DATA MANAGEMENT

The telecom, security, and safety solutions in the energy CNI sectors generate a massive amount of data daily. This data comes from various sources, such as sensors monitoring pipeline integrity, devices tracking equipment performance, and networks overseeing system security, creating a diverse and intricate data ecosystem.

[USE CASE]

ARTIFICIAL INTELLIGENCE

Traditional methods of system and data management, often reliant on manual data processing, struggle to cope with this influx. For instance, manually sorting through thousands of alerts from a telecom network to identify critical issues is time-consuming and prone to human errors, leading to potential delays and inaccuracies in decision-making.

Moreover, the data these systems generate is often unstructured and scattered across different systems and databases. Consider the example of a security solution that monitors various aspects of a facility. Data regarding access logs, alarm incidents, and video surveillance might reside in separate databases, making it difficult to consolidate and analyse holistically. This lack of a centralised and standardised data management system exacerbates the challenge, leaving organisations unable to create a unified data view.

Consequently, despite having vast amounts of data, organisations may struggle to extract actionable insights, thereby hampering their ability to make data-driven decisions.

AI FOR DATA MANAGEMENT CHALLENGES

In the ever-evolving landscape of energy CNI, organisations must adapt to effectively manage the data complexities inherent in their telecom, security, and safety systems. Addressing these challenges requires innovative solutions, and this is where AI shines.

By integrating AI into the lifecycle management of these systems, we can enhance data handling and analysis, streamlining operations and bolstering decision-making processes. AI-driven solutions leverage ML algorithms like Random Forests and Support Vector Machines to analyse large and diverse data sets swiftly. These algorithms can process a variety of data, from equipment performance metrics in telecom networks and sensor readings in security systems, helping identify patterns and trends which can inform proactive actions.

Natural Language Processing (NLP) and deep learning models like Convolutional Neural Networks (CNN) are particularly helpful for interpreting unstructured data such as textual logs in telecom systems or image data from safety surveillance systems. They can extract valuable insights from these data types, transforming them into a structured format for further analysis.

Similarly, AI-driven solutions can apply techniques like Feature Extraction and Dimensionality Reduction

to consolidate data from multiple databases, even if they are of different types or structures. For instance, security system data regarding access logs, alarm incidents, and video surveillance can be combined to give a comprehensive understanding of the security situation.

Also, ML techniques like Anomaly Detection can sift through thousands of alerts and logs to pinpoint the ones that truly matter. For instance, in a telecom network, AI can separate critical alerts from routine ones, ensuring swift action where it is genuinely needed. Besides, Reinforcement Learning, a type of ML algorithm, can aid in making optimal decisions based on the analysed data. It enables systems to learn the best actions to take in different scenarios, streamlining the decision-making process in complex environments like those in energy CNI sectors.

By deploying these techniques, AI-driven lifecycle management solutions greatly improve data management efficiency and accuracy in telecom, security, and safety solutions, facilitating improved decision-making and optimal performance.

THE FUTURE TRENDS

As AI continues to develop, it is expected to make more significant changes in how organisations manage telecom, security, and safety solutions in the energy CNI sectors. This progress suggests some key trends that could shape the future of lifecycle management.

Increased automation: Future AI systems are expected to handle an even broader spectrum of tasks. The evolution of ML algorithms will likely enable the automation of more complex tasks that currently require human intervention. This means not just automated data processing, but also predictive analytics, prescriptive maintenance planning, and even automatic resolution of routine issues.

Let us consider the task of network fault management in telecom systems employed in the energy CNI sectors, which is traditionally a complex process involving several stages like detection, identification, diagnosis, recovery, and maintenance.

Presently, AI algorithms can automate parts of this process, such as detecting network faults based on predefined conditions or patterns. However, as ML evolves, it can handle more complex tasks like diagnosis and recovery, which currently require skilled human

ML algorithms can process data from performance metrics in telecom networks and sensor readings in security systems to identify patterns and trends.

intervention. For example, an advanced AI system could analyse historical and real-time data from various parts of the network to accurately diagnose the cause of a fault. It could then suggest the most effective recovery actions or even automatically implement routine recovery procedures, drastically reducing downtime.

Such an advanced AI system could also learn from each incident to enhance its fault diagnosis and recovery capabilities over time. This is a glimpse of how the evolution of ML algorithms could enable the automation of more complex tasks in the future. The result is likely to be greater operational efficiency, productivity, and more strategic use of human resources.

Integration with IoT: As IoT continues to expand, AI-driven lifecycle management solutions will likely become more deeply integrated with IoT devices.

Consider the example of an energy production plant where different aspects of operations are monitored by an array of IoT devices. These devices may include sensors that monitor temperature, pressure, humidity, and equipment performance, along with telecom devices that ensure seamless connectivity across the plant. Currently, data from these devices is often analysed in silos, making it difficult to understand the holistic picture. But with AI-driven lifecycle management solutions integrated with IoT, this data can be consolidated and analysed in real time for a comprehensive view of plant operations.

For instance, anomalies in temperature or pressure readings might indicate a potential equipment failure. When combined with data from telecom network sensors indicating connectivity issues at the same location, the AI system can predict a potential network failure due to the impending equipment issue. This could enable proactive maintenance, preventing both equipment and network failures, and ensuring uninterrupted operations.

As IoT continues to expand, such integrated analysis will encompass data from an increasingly diverse range of sources, providing richer insights and enhancing decision-making in the energy CNI sectors.

Enhanced cybersecurity: Cybersecurity is of paramount importance in energy CNI sectors, and the future promises an even more crucial role for AI in this domain. Advanced ML models are being developed that can proactively detect and respond to cyber threats in real time. These models can continually learn from the evolving threat landscape, enabling them to predict and defend against both known and emerging cybersecurity threats. This promises to significantly bolster the overall security and resilience of critical infrastructure.

Adaptive learning and decision-making: As AI models become more sophisticated, we may see systems that not only learn from past data but can also adapt their learning strategies in response to new data or changes in the operational environment. This can lead to more effective decision-making strategies that continually improve over time, optimising operations in a dynamically changing environment.

With these trends, the future of AI-driven lifecycle management looks to be more dynamic, predictive, and secure, enabling the energy CNI sectors to maximise their potential while safeguarding their crucial infrastructure.

Despite the challenges of handling vast and complex data, AI-driven lifecycle management solutions offer a way to overcome these hurdles. They use advanced techniques to manage data, extract actionable insights, and make strategic decisions.

Future trends show a potential for increased automation, integration with IoT, enhanced cybersecurity, and adaptive decision-making, further elevating the effectiveness of these sectors. In conclusion, despite current challenges, the future of AI-driven lifecycle management in the energy sector appears promising, and equipped to deliver more secure, efficient, and reliable operations. 🌟

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New member of the data protection squad

Confidential Cloud Computing is changing the way businesses can address their critical security concerns – the protection of data during processing



BY MOHAMMED IMRAN K R

In an increasingly data-driven world, enterprises are increasingly leveraging cloud computing to drive digital transformation and innovation. However, as data becomes the currency of the digital age, data protection has become a key area of focus for businesses. The primary strategy that cloud service providers (CSPs) and businesses use to protect data in the cloud is data encryption, which helps protect data in transit and data at rest.

However, to achieve a higher grade of data protection, data must be protected even during processing. This is because before data undergoes processing by an application, it needs to be decrypted in memory. This makes the data susceptible to potential threats such as memory dumps, root user compromises, and other malicious exploits, both just before, during and immediately after the processing takes place.

CCC enables privacy-preserving machine learning, where AI models can be trained collaboratively on combined datasets without revealing individual data points.

Businesses can process and analyse sensitive data in the cloud without hesitation, which enhances their data utilisation.



SUMMING UP

- Data protection in the cloud is a top priority, with encryption safeguarding data at rest and in transit.
- Confidential Cloud Computing has emerged as a groundbreaking solution, securing data during processing.
- CCC employs encryption, hardware-based methods, and secure enclaves to ensure end-to-end data encryption.
- It enhances privacy, enabling secure data sharing, collaboration, and privacy-preserving machine learning.
- The exponential growth of CCC is projected to boost cloud adoption, data utilization, and compliance with data privacy regulations.

An emerging technology known as Confidential Cloud Computing (CCC) is showing incredible promise in helping to solve a key security challenge, the security of data while it is being processed.

CONFIDENTIAL CLOUD COMPUTING

Confidential Cloud Computing is an approach to safeguard the data during processing. While traditional security measures focus on using symmetric or asymmetric encryption to protect data at rest (data that is stored) or data in transit (data moving between locations), CCC approaches ensure that data remains encrypted and secure, even while being processed.

CCC employs a variety of technologies to achieve the data protection it offers. On one end of the spectrum, purely algorithmic solutions exist which include cryptographic approaches such as Homomorphic Encryption and Secure Multiparty Computation. On the other end of the spectrum, there are hardware-based methods such as Trusted Execution Environments (TEE), which have emerged as powerful solutions.

CCC technologies essentially create secure enclaves, a space where code and data are executed and stored separately, and cannot be tampered with by other software running in the same system, including the operating system. They can employ Confidential Virtual Machines (CVMs), also known as shielded VMs. These encrypted virtual machines are created where guest operating systems and data are encrypted.

HOW CCC ENHANCES PRIVACY

Confidential Cloud Computing has been in the spotlight because it offers a comprehensive approach to data security, ensuring end-to-end encryption throughout the data lifecycle.

One of the key advantages of CCC is that it potentially enables secure data sharing and collaboration between different parties without exposing the actual underlying data. This capability proves invaluable in industries like healthcare research and supply chain management, where data sharing is critical for future innovation, but has been fraught with privacy concerns.



CCC enables secure collaboration among organisations across geographical boundaries. This is particularly relevant in research, healthcare, and finance.

Furthermore, CCC also enables privacy-preserving machine learning, where AI models can be trained collaboratively on combined datasets without revealing individual data points. This can lead to advancements in AI, while offering data protection, enabling organisations to collaborate and collectively benefit from shared insights while protecting their sensitive information.

Confidential Computing is poised for exponential growth, according to a recent report by MarketsandMarkets, which indicates that the global market size is projected to reach USD59.4 billion by the year 2028, growing at a CAGR of 62.1% from 2023 to 2028. A significant reason for this growth would be due to modern Cloud Service Providers (CSPs) offering hardware-based Confidential Cloud Computing to customers, which makes migration a breeze.

IMPACT OF CCC ON DIGITAL TRANSFORMATION

CCC instils confidence in organisations to utilise cloud computing to its fullest potential. Businesses can process and analyse sensitive data in the cloud without hesitation, which enhances their data utilisation, and gives them a way to leverage data which they couldn't tap into before. This can potentially lead to wider adoption amongst industries where cloud adoption has been a challenge in the past due to privacy concerns. It can also unlock tremendous potential in the healthcare or financial services domain, where AI and machine learning show potential to solve some fundamental challenges, but data protection has been a challenge.

Furthermore, CCC enables secure collaboration among organisations across geographical boundaries.

This is particularly relevant in research, healthcare, and finance, where secure data sharing is essential for global progress.

Last, but not least, it helps organisations meet stringent data privacy regulations and compliance requirements. By ensuring data confidentiality during cloud processing, organisations can adhere to data protection laws more effectively. This is especially important in light of increasingly stringent safeguards that regulatory bodies are pushing organisations to deploy while dealing with sensitive customer data.

THE FUTURE OUTLOOK

As Confidential Cloud Computing is adopted more widely, it has the potential to reshape industries, drive innovation, and lay the foundation for a more secure and privacy-focused future. It would accelerate digital transformation by allowing businesses to confidently embrace the cloud and unlock the full potential of their data, while simultaneously safeguarding the privacy and security of their customers and stakeholders.

The benefits span across industries, from healthcare and finance to cloud computing, research, and supply chain management. Eventually, CCC will become vital for organisations to embrace to remain competitive, trustworthy, and at the forefront of data-driven advancements. 🌟



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Get the 'Zero Trust' approach to complete infosec

It has emerged as a comprehensive approach to all security issues. It sounds complicated but is quite simple, provided a few tips are kept in mind



BY MADHAV CHABLANI

The world has been talking about 'Zero Trust' as a comprehensive IT security strategy with a broad architectural scope covering cloud, on-premise, and hybrid environments as well as user endpoint devices. It's also extensible to the Internet of Things (IoT) and operational technology spaces, particularly in mission-critical systems where Zero Trust security can be so important. So, while Zero Trust is achievable and based on premium security principles, implementing it can be a challenging and complex, multi-year, multi-

phase undertaking with significant technical and organisational aspects to be coordinated.

Zero Trust ultimately impacts the entire enterprise security architecture, security operations approaches and many organisational roles, responsibilities, and procedures. Not surprisingly, there are several different expert perspectives in this field as well as an increasingly large number of vendor products and service offerings for implementers to try and understand, procure, implement and integrate.

Zero Trust is a strategic mindset that is highly useful for organisations to adopt as part of their digital transformations and efforts to increase security and resilience.

Given the extensive scope of Zero Trust, the numerous complex perspectives and service provider options available, with different levels of security maturity, and different business risks to consider, many organisations struggle with zero trust implementation, planning and execution.

WHAT IT IS, WHAT IT IS NOT

Zero Trust is a strategic mindset that is highly useful for organisations to adopt as part of their digital transformations and other efforts to increase security and resilience. Though it is based on long-standing principles, it is a simple approach to information security (InfoSec) that is often misunderstood and overcomplicated due to conflicting messaging within the security industry and a lack of established Zero Trust standards. Historically, InfoSec relied heavily on technical controls, with security models based on the ability to collect assets and surround them within a controlled physical perimeter. This is no longer the case.

Users were historically presumed to be “trusted” based on their location within the enterprise perimeter. It upends this concept by requiring verification, irrespective of location, before granting access to an asset. Zero Trust leverages long-standing principles like “never trust, always verify,” the concept of least privilege and the practice of segmentation to increase cyber hygiene, reduce total cost of ownership (TCO) and damage from incidents, and promote faster recovery times. By augmenting their existing security practices with Zero Trust principles, organisations establish a strong foundation for safeguarding their assets in complex and distributed environments. This proactive approach enhances security posture and minimises potential risks associated with the evolving threat landscape.

Zero Trust also recognises that breaches happen. To foster resilience, it provides for a means to contain the “blast radius” and reduce the impact of any breach while facilitating quick recovery. These same techniques increase the work and investment required by bad actors, further reducing the likelihood of incidents. Recent interest in Zero Trust is driven by new business models, the adoption of the Cloud, and new government requirements.

Moreover, Zero Trust recognises the holistic relationship between people, processes, organisations and technology, and that technical controls alone are no longer sufficient.

ADDING VALUE TO THE BUSINESS

When properly understood, the Zero Trust philosophy and strategy are valuable tools that organisations can use to enhance security, increase resilience, and guide digital transformation. And there are guiding principles that any organisation can leverage when planning, implementing, and operating Zero Trust. These best practices remain consistent across all Zero Trust pillars, use cases, environments and products. As expertise and industry knowledge mature, additional authoritative references such as guidance, policies and legislation may be added.

Zero Trust provides the required assurance through a combination of basic principles common to all Zero Trust initiatives. Organisations leverage Zero Trust to transform data and network cybersecurity management practices broadly.

Many Zero Trust management concepts have emerged, including principles, tenets, pillars, architecture plans and frameworks. While this evolution is a journey, transforming through Zero Trust is not equated to a single project (business, operations, technology) or a specific product.

Zero Trust is a mature methodology aimed at increasing the protection of critical assets in a highly distributed architecture. It requires upfront planning with all key stakeholders understanding that each ZT journey is unique. The greater the alignment with the business, the greater the likelihood of success in the Zero Trust journey.

Many organisations have changed their operating models to foster cloud adoption and remote work. Traditional security practices do not adequately address the new risk landscape this has created.

HOPPING ON THE BANDWAGON

Organisations seeking to improve their cyber resilience can no longer rely on a hard outer shell or solely on technical controls to mitigate their cyber risk.

DATA SECURITY

Zero Trust fosters resilience by providing a means to contain the “blast radius” and reduce the impact of any breach while facilitating quick recovery.

The cyber threat landscape continues to evolve and expand beyond the capabilities of a traditional fortress model to defend. The scope of what needs to be protected has expanded as well. Businesses are no longer dealing with only IT assets and data. The scope has expanded to include devices, workloads, applications and business processes residing outside of IT. This is commonly

referred to as Data, Applications, Assets, and Services, or DAAS for short.

By aligning the security architecture with the business operating model, organisations can transform their business while providing proper security without hindering business processes.

When accepted as a foundational concept, Zero Trust supports many other enterprise efforts like privacy, compliance and risk management. Zero Trust is not a standalone concept or technology. Rather, it is a comprehensive security strategy and approach that encompasses various principles, strategies, and technologies. It is designed to address the evolving threat landscape and the limitations of traditional perimeter-based security models.

Further, it is a common misconception that Zero Trust is perimeter-free. In today’s interconnected world, the perimeter is not as distinct or as solid as it once was. However, organisations cannot be relieved of their obligation to be diligent just because they cannot rely on a strategy that guarantees to keep the bad actors out and only allows the good actors in. Quite the opposite, as it is incumbent on organisations to define, monitor and control internal and external boundaries to protect their assets.

The journey toward Zero Trust is not a final destination; instead, it comprises iterative, incremental, and non-disruptive processes. Organisations should recognise it as a roadmap aligned with demands and outcomes for the Zero Trust strategy. Diversity exists in available capabilities and requirements. Shifting from theory to practice involves comprehending its implementation.

Last, but not the least, and this is important, businesses need to understand and build capacities, train people and make hands-on possible. 🙌

Madhav Chablani is Consulting CIO with the Healthcare Group and Chairman of Cloud Security Alliance – NCR (India).

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THE GUIDING PRINCIPLES

The following principles are designed to help practitioners stay on track and manage the Zero Trust journey.

- Begin with the end in mind
- Do not over complicate
- Products are not the priority
- Access is a deliberate act
- Inside out, not outside in
- Breaches happen
- Understand your risk appetite
- Ensure the tone from the top
- Instill a Zero Trust culture
- Start small and focus on quick wins
- Continuously monitor

Holistic policy framework for digital ‘Antyodaya’

A series of well-coordinated policy tweaks will help realise the grand vision of Digital India, transforming millions of lives



BY DEEPAK MAHESHWARI

Reliance on digital connectivity, devices and services continues to grow and is becoming increasingly indispensable across education and entertainment, commerce and communication, healthcare and hospitality, governance and global trade, essentially every aspect of human endeavour. Despite tremendous

growth in recent years, not everyone has been able to participate and benefit from it yet.

In line with the grand vision of Digital India as well as the G20 Digital Economy Working Group’s Outcome Document & Chair’s Summary, a comprehensive framework of a mutually exclusive yet collectively

Physical, neurological and learning disabilities afflict a sizable population in India and need varying support to use and participate in the digital economy.

It is crucial to ensure cybersecurity in our space mission, besides its increasing importance in the realm of national security, intelligence and law enforcement.

exhaustive set of policies is needed in the country to realise digital 'antyodaya'.

MEANINGFUL UNIVERSAL ACCESS

In addition to its ensuing deployment for network expansion, the Universal Service Obligation Fund (USOF) should subsidise cost for device as well as for service for the targeted beneficiaries based on objective and transparent criteria through the Direct Benefit Transfer (DBT) platform. Requisite skilling, availability of relevant services and applications in local languages are also needed.

DATA PROTECTION

The Digital Personal Data Protection Act, 2023 (DPDPA, 2023) became a reality after 25 years. It is only logical to thoughtfully proceed towards consultative rulemaking. Moreover, significant resources would be needed towards establishing, supporting and strengthening the statutory institution, viz., the Data Protection Board of India.

CYBER SECURITY

Considering the rise in incidents of cybercrime and other challenges in cyberspace, the decade-old National Cyber Security Policy, 2013 must give way to an updated National Cyber Security Strategy. Admittedly, the National Cyber Security Secretariat had sought comments around 3 S's – Secure (national cyberspace), Strengthen (structures, people, processes, capabilities) and Synergise (resources including cooperation and collaboration). However, this must be expedited and must foster voluntary public-private partnerships while also deterring miscreants.

NON-PERSONAL DATA

Data that is not personal data is called non-personal data (NPD). Following the National Data Accessibility and Sharing Policy, 2012 a lot of government data sets have been put up on the open data portal data.gov.in. Though an earlier version of the Data Protection Bill did include the NPD, it does not find any mention in the recently passed DPDPA, 2023. The government had

released a couple of drafts of the data sharing policy. However, the final policy is still awaited.

ACCESSIBILITY

Physical, neurological and learning disabilities afflict a sizable population in India and need varying support to use and participate in the digital economy. These include, but are not limited to, choices for font sizes, extent of brightness and contrast as well as speech to text and text to speech solutions. Some may need special keyboards or extra time to enter an OTP (one time password). Not many websites in the country comply with the Web Content Accessibility Guidelines (WCAG) of the World Wide Web Consortium (W3C). Hence, the National Policy on Universal Electronics Accessibility, 2013 should be rigorously implemented and if needed, revised and updated.

E-COMMERCE

While the Open Network for Digital Commerce (ONDC) has already been rolled out, the e-commerce policy should be notified sooner than later even as the government had invited comments on the draft e-commerce policy in 2019. Incidentally, e-commerce in India has been around for more than 25 years.

ARTIFICIAL INTELLIGENCE

Much before ChatGPT and its ilk became the rage, NITI Aayog had initiated discussions on Artificial Intelligence (AI) in 2018. The discussion draft was subsequently adopted as the National Strategy For AI. Admittedly, the Department for Promotion of Industry and Internal Trade (DPIIT) and the Ministry of Electronics & Information Technology (MeitY) had also initiated their respective discussions on AI. Some states have their own AI policies.

COORDINATION PLATFORM

Issues pertaining to digital ecosystem are dispersed across multiple ministries, departments, and agencies. The Department of Telecommunications (DoT) deals with digital connectivity while the Ministry of Electronics & Information Technology (MeitY) deals

A coordination mechanism under the PMO is needed to minimise incidents of overlaps and gaps while also orchestrating optimal use of resources towards the objective of digital 'Antyodaya'.



IN SUMMARY

- Digital connectivity is crucial across various sectors, but not everyone has equal access.
- Policies should include subsidies for devices and services, skilling, and local language support.
- The Digital Personal Data Protection Act, 2023 requires thoughtful implementation.
- Cybersecurity challenges call for an updated National Cyber Security Strategy with public-private partnerships.
- Non-personal data (NPD) regulation and accessibility for disabilities need attention.
- E-commerce and Artificial Intelligence policies should be expedited.
- Coordination among various ministries is vital for a comprehensive digital strategy.

with issues of cyber law and e-governance, etc. On the other hand, the Ministry of Information & Broadcasting (MIB) deals with the streaming of digital content, the Department for Promotion of Industry and Internal Trade (DPIIT) deals with the e-commerce policy while the Ministry of Consumer Affairs deals with issues of consumer protection.

In addition, the Ministry of Home Affairs (MHA) deals with cybercrime while the Ministry of Women & Child Development (WCD) looks at online safety of women and children. Incidentally, the national cyber security strategy had been initiated by the National Cyber Security Coordinator within the National Security Coordination Secretariat. Besides the National Critical Information Infrastructure Centre (NCIIPC) under the National Technology Research Organisation (NTRO), there are sectoral bodies in charge of cyber security.

All the financial sector regulators have also been quite active in the space of banking, payments, securities, insurance, and pension. NITI Aayog is engaged in AI. In addition, each state has its own respective IT departments and policies. Last but not the least, it is crucial to ensure cybersecurity in our space mission, besides its increasing importance in the realm of national security, intelligence and law enforcement.

Accordingly, a coordination mechanism under the Prime Minister's Office (PMO) is needed to minimise the incidents of overlaps and gaps while also orchestrating optimal use of scarce resources towards the common objective of digital 'Antyodaya'. 🙌

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IT spending growth in a year of profit surge

Bharti Airtel, one of India's two behemoth telecom operators alongside Reliance Jio, used the year to make tech acquisitions and announce related moves



BY VERNIKA AWAL

In a financial year that coincided with the launch of public 5G services, telecom giant Bharti Airtel significantly increased its overall technology investments.

This surge in tech spending was driven by a series of acquisitions and announcements made over the year, signifying a period of growth and consolidation for one of Asia's largest telecommunications companies.

A quick look through the FY 23 annual report pegs Airtel's total expenditure on information technology (IT) operations and infrastructure at Rs 657.9 crore — up 22.7% year-on-year (YoY) from Rs 535.8 in FY 22. The IT expenditure is a part of Airtel's 'other expenses' tab, under which the company spent Rs 7,879.4 crore in FY 23. This part of the telco's expenses rose nearly proportionately to its overall IT expenditure.

Airtel's net expenditure for the year stood at Rs 67,871.3 crore, rising 15% YoY in FY 23, from Rs 59,013 crore. The overall IT outlay made for 8.3% of Airtel's

cumulative 'other' expenses, and just under 1% of its net annual expenses.

To be sure, Airtel's operating revenue for the year grew 19.4% YoY to Rs 1.39 lakh crore. The key takeaway from Airtel's FY 23 annual report, interestingly, is a sharp rise in its net profit, which rose by a significant 47.9% YoY to Rs 12,287.4 crore, up from Rs 8,305.2 crore in FY 22.

The key takeaway, therefore, lies in Airtel's rise in profitability, while the telco succeeded in keeping its expenditures in check.

LEADERSHIP COMMENTARY: 5G AND DIGITAL ASSETS LEAD GROWTH

In his annual shareholder address, Sunil Bharti Mittal, Chairman of Bharti Airtel, said, FY 23 was a milestone year in the Indian telecom industry with the launch of 5G services. We were able to leapfrog into the 5G era, supported by visible ease of doing business in the



“We were able to leapfrog into the 5G era, supported by visible ease of doing business in the spectrum auction and allocation processes.”

Sunil Bharti Mittal
Chairman, Bharti Airtel

KEY TECH DEALS ANNOUNCED

- **April 2022:** Acquired stake in cloud network solutions provider, Cnergee Technologies.
- **May 2022:** Established a digital tech hub in Pune and announced plans to hire 500 employees.
- **June 2022:** Launched a ‘metaverse’ multiplex.
- **July 2022:** Deployed private 5G network at Bosch facility.
- **August 2022:** Commenced 5G rollout in India.
- **September 2022:** Launched edge datacentre and content delivery services.
- **October 2022:** Launched ‘always-on’ enterprise IoT solution.
- **November 2022:** Commenced construction of hyperscale datacentre in Kolkata.
- **December 2022:** Announced joint connectivity partnership with Meta; private 5G deployment partnership with Mahindra; acquired stake in startup Lemnisk; announced remote AI-led colonoscopy trial through 5G in partnership with Apollo Hospitals and Amazon Web Services.
- **February 2023:** Deployed AI speech analytics for customer service with Nvidia; announced a partnership with Vultr.

spectrum auction and allocation processes. Airtel became a frontrunner in this next generation of communication services, and created history by being the first telecom operator to have launched its 5G services in eight cities on the occasion of the India Mobile Congress’ 5G launch.”

Mittal further added that Airtel also experienced its “highest ever market share... be it in B2B or B2C businesses (through FY 23).” The telco, Mittal confirmed, closed FY 23 with a base of over 31 million 5G smartphone users. He also touched upon Airtel’s rollout of digital payments and other value-added solutions throughout the year, as part of the company’s tech offerings.

Among tech collaborations, Mittal confirmed, “Airtel continues to have strong strategic collaborations with industry leaders like Amazon, Cisco, Ericsson, Google, IBM, Intel, Meta, Microsoft, Netflix, Nokia, Oracle, Qualcomm and many more.”

Gopal Vittal, Chief Executive and Managing Director of the company, further highlighted the key role that tech enablement has played for the telco. In his shareholder address, Vittal said, “We have a three-layered business model. The first is digital infrastructure. This is the highway that drives much of India’s economic and digital activity. The second is digital experience, which sits above digital infrastructure. The third is digital services, including digital businesses such as Airtel Finance, Wynk (music streaming), Nxta (datacentre), Airtel IQ (Communication Platform as a Service or CPaaS business), Airtel Payments Bank and Airtel Ads.”

Through FY 23, and in outlook to FY 24, Vittal affirmed that Airtel is taking a platform approach, with products divided across four categories – buy, bill, pay and serve. 🌐

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