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"BECOMING SELF-SUFFICIENT IN SEMICONDUCTORS MAY TAKE SOME TIME"

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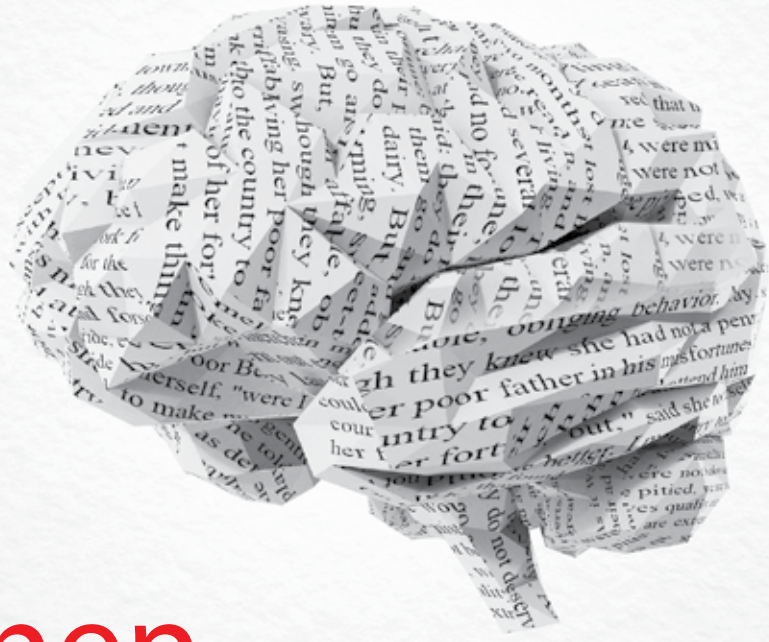

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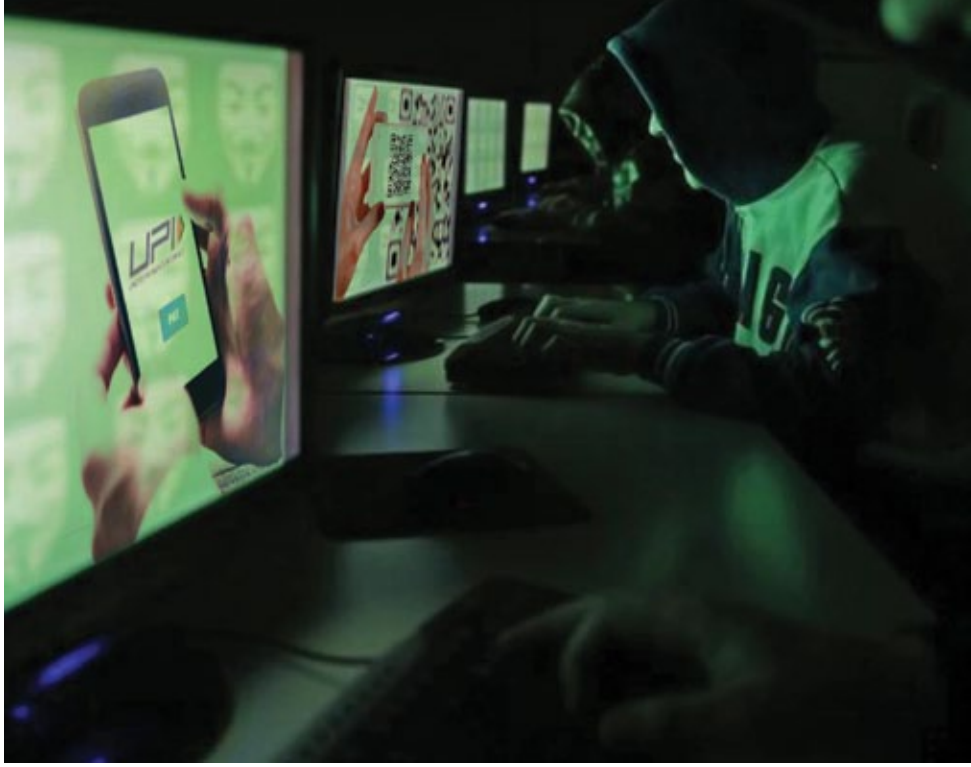

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SHUBHENDU
PARTH

[OPENING NOTE]

Propelling India to leadership in telecom equipment manufacturing

India's ascent in telecom equipment manufacturing, solidifying its global supplier status, is underscored by a remarkable 133% surge in exports, soaring from Rs 41,561 crore in 2020-21 to Rs 96,816 crore in 2022-23. Simultaneously, imports rose by 11.67%, reaching Rs 1,34,000 crore during the same period. These figures underscore global acceptance of India's quality products and highlight domestic market potential.

Against this backdrop, the decision by the Telecommunication Engineering Centre (TEC) to expand the Simplified Certification Scheme (SCS) product list, effective from 1 January 2024, is pivotal for fostering indigenous manufacturing and enhancing the ease of doing business in the sector. TEC, an agency under the Department of Telecommunications, plays a vital role in certifying telecom products and shaping the sector's future through technological forecasting and envisioning next-gen network elements.

The SCS, tailored for Group A equipment, revolutionises the certification process. Under this scheme, applicants can now submit a test-wise compliance sheet and a Self-Declaration of Conformity (SDoC) for parameters in Essential Requirements (ERs). This departure from the traditional model, where test reports from Conformity Assessment Bodies were mandatory, streamlines and expedites certification.

According to a Ministry of Communication press release, the expansion of the scheme aims to slash the certification timeline from eight weeks to a mere two weeks. This reduction in processing time aligns well with the broader governmental vision of promoting a more agile and responsive business ecosystem.

The addition of 37 products under the SCS spans a broad spectrum, from media gateways and IP security equipment to optical fibre or cable and transmission terminal equipment. This expansion elevates the total number of products covered under the SCS from 12 to 49, offering a more comprehensive scope for businesses seeking certification.

An applaudable facet of this initiative is the revised fee structure, wherein TEC will only charge an administrative fee for ER-based applications submitted under the Mandatory Testing and Certification of Telecom Equipment or MTCTE regime. Notably, the TEC has taken a customer-friendly approach by waiving the evaluation fee, a gesture that has been warmly received by OEMs and applicants alike.

The streamlined process and reduced certification timeline are expected to stimulate innovation by allowing certified products to reach the market faster. This forward-thinking approach not only benefits businesses but also positions India as a more attractive destination for telecom equipment manufacturing and certification.

TEC's decision to embrace change and simplify the certification process underscores India's commitment to creating a conducive environment for local manufacturing. As the country navigates the complexities of telecom equipment manufacturing, this move serves as a beacon, guiding towards a future where efficiency, innovation, and business success converge. Additionally, it helps India address the 4% 'cost disability' compared to China and Vietnam due to higher manufacturing costs, as highlighted in a recent TRAI report.

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Transforming urban living and citizen experiences

Town planners and administrators must utilise new technologies to build a future-ready network infrastructure that allows them to make cities smarter

BY AMIT MALIK

Over the last few years, India has adopted several initiatives to improve its urban infrastructure and enhance the quality of life for city dwellers. The growing influx of people from rural to urban areas and the need to modernise the existing infrastructure are the key reasons for this.

As the urban population continues to grow, municipal infrastructure such as power grids, water systems, and transportation networks struggle to keep up. According to the government's projections, 597 million people will reside in Indian cities by 2036, with the existing infrastructure inadequate to address this exponential growth in the urban population.

Realising that smart cities can help improve the quality of urban life sustainably and also better manage future growth, India launched the Smart Cities Mission in 2015. The project aims to use technology solutions to improve the quality of life of citizens in 100 towns and cities.

Creating a smart city – one that is connected and automated wherever possible via a strong, secure communication network is no easy task. It requires an extensive system of sensors, device analytics, and data centres designed to maximise the use of available resources to improve the quality of life for city dwellers. Well-planned smart cities offer significant benefits to authorities as well as residents. While they empower the administration to easily and better manage the infrastructure, city dwellers benefit from improved and sustainable government services including healthcare, education, transportation, energy and public safety, among others, and prompt response from the administration.

> A smart city requires a highly reliable network that allows the city management to introduce new technologies quickly and at scale.

ADAPTIVE NETWORKS FOR SMART CITIES

Creating a smart city is no easy task. For instance, the Smart Cities Mission includes up to 7,800 projects, of which 5,700 have been completed with the remainder likely to be done by mid-2024. Initially, most smart city projects focused on specific applications, such as smart lighting or traffic management, managed by individual agencies.

However, the concept has evolved with several technologies and agencies working in tandem to maximise the benefits. Data generated from the projects needs to be shared between agencies so it can be used for better management and to ensure an improved experience for citizens. It now requires a more converged connectivity platform, enabling easy sharing of data between all the stakeholders.

In addition, a smart city also uses Artificial Intelligence (AI) and Machine Learning (ML) to gain actionable and real-time insights from the data. This allows city administration to quickly resolve a problem or proactively address a situation even before it starts to impact the citizens.

Through the Smart Cities Mission, Integrated Command and Control Centres (ICCC) were set up across India. For example, the Srinagar ICCC has been integrated with the 'mySrinagar' Smart City mobile application, providing a one-stop solution for citizens and tourists in Srinagar, to quickly access digital services for day-to-day civic life within the city, and for effective disaster management. Technology has been adopted to monitor water levels and rainfall collection, and the data collected to make predictions about the likelihood of a flood. Now, before any heavy rainfall or snowfall, citizens in Srinagar are alerted through the application.

Such smart city applications use data and bandwidth-intensive technologies that require network flexibility and agility. A smart city requires a highly reliable network that allows the city management to introduce new technologies quickly and at scale. This is crucial because the demands from city infrastructure are constantly evolving and the administration should be able to meet them quickly and easily.

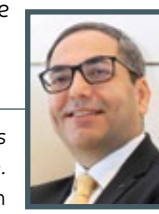
An adaptive network that offers a combination of network intelligence, software control and automation and programmable infrastructure would help city administration to address these needs. Analytics and intent-based policies of adaptive networks allow city management to scale rapidly while self-configuring and self-optimising by regularly evaluating network pressure and demands.

MEETING HIGH-BANDWIDTH NEEDS

The growing number of smart city initiatives in India requires a programmable network that can address the requirement for fluctuations in bandwidth, traffic prioritisation and avoidance of network congestion and outages. This is a challenge for most service providers as identifying the root cause and resolving service issues across multi-layer networks in real-time using conventional service assurance tools could take significant time and effort. This negatively impacts business productivity and increases operational expenses, not to mention violation of the Service Level Agreements and customer churn.

A unified, automated approach that simplifies service assurance across multi-layer networks helps in quick identification and resolution of the problem's root cause. This can be addressed by integrating intelligent automation platforms that can analyse alarms and alerts across network infrastructure and in case of a direct relationship, swiftly identify the problem. This approach helps in bringing down the time to resolution thus ensuring improved customer satisfaction.

Smart cities must utilise new technologies to build a future-ready network infrastructure that allows them to make a city smarter and truly enrich the lives of citizens in urban spaces.



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Striking a balance or walking a tightrope?

India's recently passed Telecom Bill has been appreciated for its futuristic approach. However, it still leaves some issues open

BY VERNIKA AWAL

On Christmas Eve, the Telecom Bill 2023 received the assent of President Droupadi Murmu, thereby making it into law. Now an Act impending its ongoing rule-making process, the new law for the mammoth telecommunications sector has been hailed in specific areas for fruitfully modernising various aspects of the industry. This, many have argued, has been achieved through easing access to spectrum in some cases, not regulating online data-based services in others, and upholding the ease of doing business in the sector.

However, legitimate concerns have been raised by others in terms of how much the Act has achieved—in terms of modernisation of licensing, censorship, interference in online services, and handling of personal user data. These concerns are driven by how clauses have been formulated in the Act, showcasing ambiguity in many cases and leaving considerable room open for interpretations and further clarity.

As the rule-making process for the new telecom law ensues, here is a look at four appreciations of the Act and four criticisms of it, too.

"The new Telecom Bill replaces 'licence' with 'authorisation' specifying that authorisation would be required to provide telecommunication services."

Lt Gen (retd) Dr SP Kochhar
Director General, Cellular Operators Association of India

THE PROS

#1

Constitutionalising allocation of spectrum

One of the biggest factors that drew ubiquitous appreciation in the Telecom Act, 2023 is in constitutionalising the procedure for administrative allocation of spectrum for various broadcasting and communications services. The Act brings relief to the nascent satellite communications (satcom) sector by including it under the services for which spectrum allocation can be conducted.

An allocation process is beneficial in many ways since it enables the government to offer companies a spectrum-sharing approach to offer services related to broadcasting and communications. So far, the commonly used process for auctioning spectrum has seen private entities acquire exclusive usage of spectrum. This process, typically, leads to large entities with deep pockets acquiring spectrum—thereby getting the power to privately control services as well as the pricing involved in any entity being able to access spectrum. In ways, auctioning can leave out new entrants in the telecom industry, by actively discouraging them due to very high capex requirements.

Administrative allocation, particularly for satcom services, will be beneficial as it can bring forth a more open and competitive market. By enacting this into law, the Telecom Act, 2023 can potentially open the doors for a more competitive overall broadcasting and communications market—with more choices for consumers to follow.

#2

Leaving OTTs out of traditional telecom ambit, for now

One of the key debates leading up to the tabling of the Telecom Bill, 2023 was around whether internet-based, online and data-driven services, such as Meta's WhatsApp, Netflix, Google's YouTube and so on, would come under the ambit of the same set of regulations that govern traditional broadcasting and telecommunications services.

This concern has been somewhat alleviated as the Act foregoes explicit inclusion of Internet-based services, classified typically as over-the-top (OTT) services, from the legislation. Backing this up further while speaking with media, Union Telecommunications Minister Ashwini Vaishnaw indicated that OTTs will indeed not be regulated under the Telecom Act, and will be regulated by the Ministry of Electronics and Information Technology (MeitY) and legislations of the Information Technology Act.

The move is a welcome one for most online service providers since it helps them avoid similar restrictions, regulations for providing services, and prosecutions that are faced by traditional telecom operators. This is a crucial piece of legislative difference, particularly because OTTs are inherently and structurally different from any traditional telecom service—and industry advocates have long argued that they cannot be regulated in the same vein as traditional services.

#3

Regulatory stability for licensing, penalties and ease of business

The Telecom Act has replaced the much-criticised licensing procedures with a digitised authorisation process instead, for service providers looking to gain clearance for offering services. Penalties levied for breach of law have received a spate of clarifications, which too have been appreciated by many stakeholders of the industry. All of this, industry stakeholders have said, will benefit the sector.

"The Bill brings in the proportionality and nexus with the nature of the offence and will lead to a considered and rational approach to penalties. It is a progressive

"Given that the Bill aims to protect consumers, it is important that the sensitive personal information of users is not misused in the data processing lifecycle."

Shreya Suri
Partner, Induslaw

step designed to increase industry confidence and increase ease of doing business. It replaces 'licence' with 'authorisation' specifying that authorisation would be required to provide telecommunication services. This would simplify the overall regulatory landscape for telecom services," said Lt Gen (retd) Dr SP Kochhar, Director General of the telecom industry body, Cellular Operators Association of India (COAI).

The Act also did not fiddle with any postulates of foreign direct investment (FDI) in the telecom sector—right now, 100% FDI is permitted in telecom, with 49% not requiring any government approval.

#4

Attempt at reducing telecom frauds

Finally, many stakeholders have stated that the Telecom Act's move to cut down on telecom fraud is a largely positive one. This has been done by imposing a three-year imprisonment term and penalties of Rs 50 lakh for SIM card fraud. Any new user onboarding will further require biometric authentication of a user, which in turn could add significant accountability to the entire procedure of users gaining access to telecom services. Cloning of SIM cards, too, is now a civil, financial and criminal offence.

This will be crucial, as a multitude of online crimes and frauds have proliferated in the industry due to widespread access to connectivity. Regulating access by linking users to connections used by them could also boost traceability and tracking down of individuals in case of cyber complaints being filed against them.

THE CONS

#1

Uncertainty around the definition of OTT

While Vaishnaw has offered verbal clarification on OTTs not being included for regulation in the Telecom Act, the lack of concrete codification of this under the law has left wide room for ambiguity—and the potential for future modification in its overall interpretation. Such ambiguity in interpretation could mean that hypothetically, unless OTTs are codified firmly under law, they may at some point be regulated within the same ambit as traditional telecom services.

Industry stakeholders have expressed similar concerns emphasising the ambiguity surrounding the exclusion of OTT services from the legislation. Experts point out that the definition of 'telecommunication service' in the current version is broad enough to potentially include OTT services, raising the possibility of state and, particularly, DoT intervention in the domain of internet services, such as WhatsApp, Signal, and others.

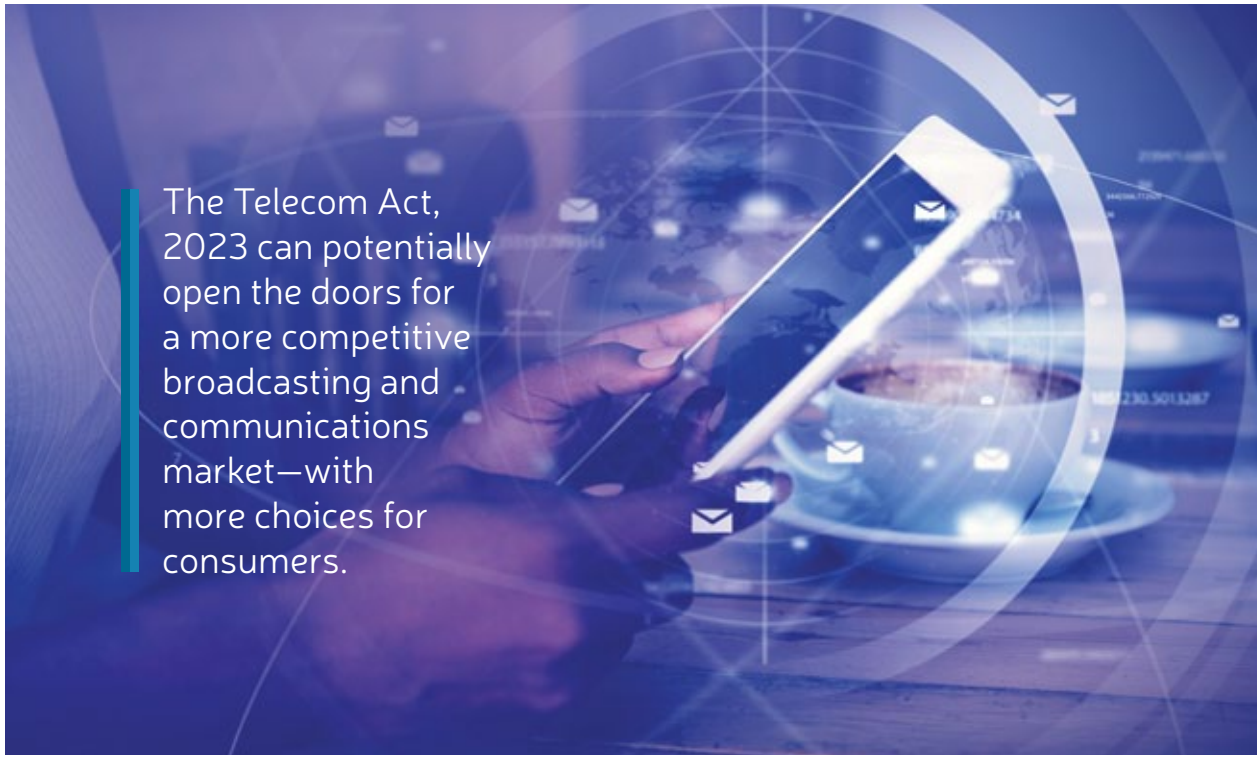
#2

Government control and censorship

One of the biggest concerns about the Act is around government control and censorship of the freedom of speech and communications—without leaving any room for checks and balances. These are included in clauses 19(f) and 20(2) of the Telecom Act, 2023. These give the government control over "any message or class of messages, to or from any person or class of persons, to or from any telecommunication equipment or class of telecommunication equipment, or relating to a particular subject brought for transmission by, or transmitted or received by any telecommunication service or telecommunication network."

Control over such a sweeping definition of communications services has been afforded to the Centre, which can now cite national security interests to crack down on any service. Industry experts have argued that this has been done without keeping in place any accountability for the government to take over services.

Clause 3(7) of the Act is the one that deals with this and leaves open a wide band of situations which the



government may be able to use for its benefit—without users or companies having any apparent recourse against it.

#3

Questions around licensing and authorisation

While experts have argued that shifting from 'licensing' to 'authorisation' in the Telecom Act represents a significant change, closer examination suggests that the main difference lies in the digitisation of procedures.

Additionally, state bodies now have specific authorisation powers for telecom infrastructure deployment. However, aside from these aspects, the authorisation process closely resembles the previous licensing framework, raising questions about the actual regulatory differences on the ground.

#4

Concerns around personal privacy of users

The Act raises significant concerns regarding the use of user biometrics for safety measures, creating uncertainties about potential misuse, targeting, censorship, and overall data handling.

According to Shreya Suri, Partner at Induslaw, the involvement of multiple intermediaries in collecting and processing sensitive information poses challenges. "Whether they will have appropriate technical and organisational measures in place to ensure the security of the personal data being collected as well as meeting other compliance obligations under the Digital Personal Data Protection Act, 2023 is a question which needs to be evaluated before implementing this process," she said.

Suri further emphasised the need to prevent the misuse of users' sensitive personal information, aligning with the bill's goal of consumer protection. "Given that one of the aims of this Bill is to protect consumers, it is important that such sensitive personal information of users is not misused by any entity in the data processing lifecycle."

Regarding telecommunication identifiers, expected to identify users linked to biometric information in the verification process, Suri highlights uncertainty. It remains unclear if the central government's allocation of these identifiers grants access to underlying information. Suri urges that any access should adhere strictly to circumstances and situations permitted under the DPDP Act.

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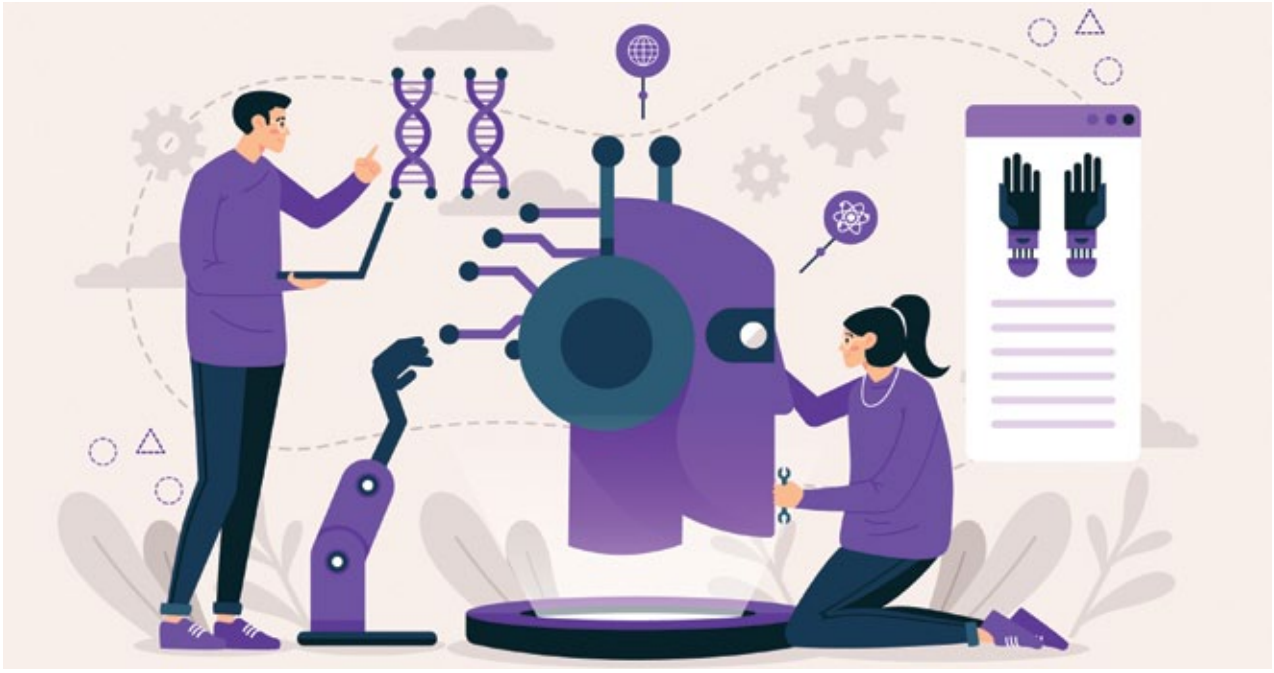
Creating India's first-generation indigenous AI infrastructure

The 'India AI Programme' aims to bring to the forefront efforts to create the first generation of indigenous AI infrastructure in the country



BY VERNIKA AWAL

On October 13, the Union Minister of State for Electronics and Information Technology, Rajeev Chandrasekhar, spoke about the India AI Programme at a press briefing. Under the ambit of the Ministry of Electronics and Information Technology (MeitY), this programme is set to define the development of datasets, as well as indigenous compute capability, for what is being colloquially referred to as Indian artificial intelligence (AI). In reality, the policy is a much-needed move that can not only bring multi-billion-dollar contributions to the country's economy but also bring about considerable democratisation in the access to technology within the nation.

"We are creating AI compute capacity in the public sector, where C-DAC is building an indigenous AI compute service—Param Rudra."

Rajeev Chandrasekhar
Minister of State, Ministry of Electronics and Information Technology, Government of India

> India's infrastructure for AI chips is crucial as most chips used for AI tasks in India are presently designed in the US, and manufactured in Taiwan.

WHAT IS THE 'INDIAN' AI?

To put things simply, what is being referred to as 'Indian' AI is essentially a version of global AI applications and infrastructure, tuned specifically to Indian enterprise sensibilities. An early attempt at setting this up lies in the MeitY-backed Bhashini—the datasets project under the Centre that seeks to develop and deploy local language databases within indigenously developed mobile applications.

It is interesting to note that Bhashini, in many ways, laid the foundation stone for the development of Indian AI infrastructure. By creating repositories of local language data of 22 languages of India, Bhashini laid the early approach towards creating a data infrastructure framework—leading up to the formation of the India AI Programme.

'Indian' AI, on this note, refers to the development of local language datasets, as well as locally accessible hardware that can power AI applications suited to lower costs. At the heart of the India AI Programme lies the fact that today, AI as we know it is considerably expensive to operate—thereby making it a near-exclusive club for Big Tech companies to play in. India, on this note, wants to alter this.

BIRTH OF THE INDIAN AI INFRA

Detailing this further in a media interview, Chandrasekhar said: "We are creating AI compute capacity in the public sector, where the Centre for Development of Advanced Computing (C-DAC) is building an indigenous AI compute service—Param Rudra. For the private sector, we have submitted a proposal to the government and it will need funding. The idea is to create a significant amount of Graphics Processing Unit (GPU) capacity in the private sector, with the government as a partner. This will be like a public-private partnership. The latter will give AI compute as a service for startups, researchers and for anyone who has a model that needs to be trained." This details what the programme will bring along with it.

Set to be announced in January 2024, India AI will seek to grab Big Tech and use their solutions to be able to design chips that are cheaper to scale and deploy in the market—than the most commonly used commercial standard at the moment from US chipmaker Nvidia.

At the heart of this effort will be an intention to make chips available to academia, researchers and startups. Academia, in particular, has complained for long about the lack of access to resources that could help them scale applied research efforts in AI. Unlike large conglomerates, institutions in India have little budget to acquire high-performance computers, complete with servers of cloud-based GPU access to speed up research efforts. Owing to this lack of financial resources, Indian academia is, for now, lagging behind its US counterparts in the pace of adoption and adaptation of AI research.

WHAT IS THE PRIVATE SECTOR DOING?

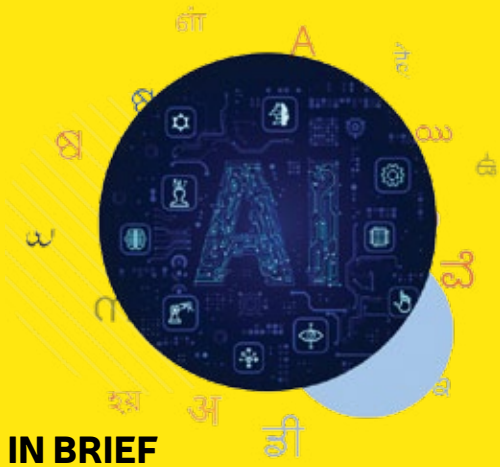
As the country gears up towards the announcement of the India AI Programme, private entities are accelerating work with larger available capital. On December 6, Hiranandani Group's data centre project, Yotta Data Services, announced a partnership with Nvidia to create an on-cloud supercomputer, called Shakti Cloud. The service is set to go live this month itself, and customers will have access to 4,096 GPUs on the cloud through its platform.

By June this year, the GPU capacity is expected to increase 4x, while by end-2025, this capacity is expected to finally reach its target of 8x the number of chips it inaugurated with.

Access to top-grade Nvidia GPU chips is crucial for running generative AI applications, the flavour of the season in 2023. These chips are one of the most reliable and most powerful, hence justifying their massive market demand at the moment.

Nvidia, however, has not just partnered with Yotta. On September 8, the company announced two successive

Bhashini laid the early approach towards creating a data infrastructure framework—leading up to the formation of the India AI Programme.



IN BRIEF

- The India AI Programme will focus on local language datasets and affordable AI infrastructure to democratise technology access and boost the economy.
- It involves tuning global AI for Indian sensibilities, with Bhashini laying the groundwork for local language datasets. The program focuses on affordability.
- The programme plans to create public and private sector AI compute capacity, making AI more accessible through partnerships and funding initiatives.
- Private entities are partnering to create on-cloud supercomputers and AI clouds, accelerating AI infrastructure development.
- Building India's chip capability is crucial geopolitically, offering immunity and bargaining power in conflicts and fast-tracking development.

deals with two of the country's largest conglomerates—Reliance Industries and Tata Sons. While Jio Infocomm, the tech and telecom subsidiary of Mukesh Ambani's RIL, will leverage Nvidia to build local language development infrastructure, Tata's applications are two-fold—one, building an AI cloud to be served directly to clients through a cloud platform running on Nvidia chips. Two—through Tata Consultancy Services, India's largest IT services firm, the latter will develop AI-driven applications for its clients.

DEVELOPMENT OF THE IDEA

Building India's chip capability will also, in the mid-term future, tie in with the India Semiconductor Mission (ISM). Under the latter, the Centre continue to field new applicants for the production-linked incentive (PLI) scheme in this sector. Given that the onus of indigenous chipmaking will take a while to be realised, and the Centre modernising India's fab, Semi-Conductor Laboratory (SCL) in Mohali, ISM could well help fast-tracking the development.

The development of India's infrastructure for AI chips is also crucial from a geopolitical standpoint. At present, most chips used for AI tasks in India are designed in the US, and manufactured in Taiwan. Given the propensity of geopolitical conflicts with two ongoing wars at the moment, designing and developing chips locally will give India immunity and soft bargaining power with other nations that do not have the bandwidth to source commercial-grade chips for academia.

While there is no timeline at the moment, a two-year tentative plan to see the first batch of indigenously developed chips coming in physically is in store right now, as per industry officials with knowledge of the matter. This timeline, many have said, is practical too; Indian-origin chip designers and engineers make up one-fifth of all chip designers globally. Cashing in, therefore, only seems to be the right idea going forward.

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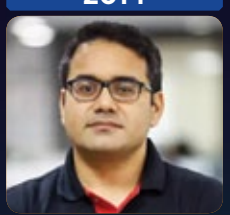
Salil Parekh	Ajay Sawhney	Rajesh Gopinathan	Prakash Kumar	Ritesh Agarwal	Bhavish Agarwal

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

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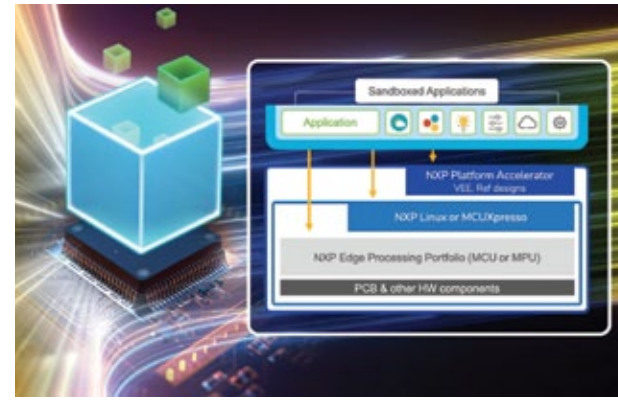
NXP unveils platform accelerator for IoT Edge applications

NXP Semiconductors, in collaboration with MicroEJ, has launched the NXP Platform Accelerator, transforming the software design process for industrial and IoT Edge applications. The platform utilises MICROEJ VEE software containers with standardised APIs, providing a smartphone-like experience and enabling manufacturers to streamline product development, reducing costs.

Addressing challenges associated with developing smart devices for industrial and IoT markets, the NXP Platform Accelerator ensures software portability across NXP's portfolio of RTOS-based MCUs and Linux-based Applications Processors. This accelerates new product development by seamlessly integrating advanced functionalities like power management and 3D/2D graphics from NXP's processor portfolio.

The NXP Platform Accelerator tackles the complexity of smart device development by utilising software containerisation, allowing binary software portability across NXP processors, from MCUs to applications processors. This approach promotes rapid prototyping and facilitates the creation of a diverse portfolio of smart devices adaptable to evolving market needs.

Additionally, the platform introduces sandboxed application deployment at the edge, bringing capabilities



like over-the-air updates, downloadable apps, and microservices. The NXP Platform Accelerator integrates advanced development tools, including simulation, virtual device management, and support for multiple programming languages.

Currently available for NXP's processors, including the i.MX RT595 and i.MX RT1170 crossover MCUs, the NXP Platform Accelerator empowers manufacturers to unlock the full potential of NXP's hardware innovations, making development processes more efficient and agile in the rapidly evolving landscape of industrial and IoT edge technologies.

Etisalat, Huawei trial world's first 1.6Tbps optical solution

Etisalat by e& and Huawei recently announced the successful completion of the world's first 1.6Tbps per wavelength technology trial on an optical transport network, marking a significant milestone in the ultra-high-speed optical industry. This achievement positions Etisalat by e& as fully prepared for the 100T network platform, a crucial step towards hyperscale cloud computing and the acceleration of the 10 Giga UAE Initiative.

Continuing its leadership in the optical industry, Etisalat by e& showcases innovative solutions and early technology adoption. The 1.6Tbps per wavelength technology, tested in collaboration with Huawei, is a part of their commitment to delivering an advanced and robust network in the UAE. Specifically, it demonstrates the capability of 1.6Tbps on the DC-centric OSN 9800 Kepler platform, addressing the growing demand for cloud-based business services, enhanced home broadband, and 5G services.

Khalid Murshed, Chief Technology and Information Officer, Etisalat by e&, expressed their commitment to delivering a premium customer experience and emphasised the innovation's role in providing one of the fastest and energy-efficient connectivity for hyperscale computing. The 1.6Tbps technology not only meets the increasing capacity demands but also reduces per-Gbit power consumption by 65%, laying the groundwork for a modern digitalisation and environment-friendly future.

Victor Zhou, President of Huawei's Optical Transmission Domain, highlighted their collaboration with Etisalat by e& and emphasised Huawei's commitment to technological innovation, supporting Etisalat in enhancing user experience and creating greater business value.

GlobalLogic acquires Mobiveil for embedded software capabilities

Digital engineering company, GlobalLogic, has signed a definitive agreement to acquire Mobiveil, a specialised embedded engineering services firm based in the United States. The acquisition aims to broaden GlobalLogic's capabilities in embedded software, essential for digital products and services in industries such as semiconductor, automotive, media, medtech, and high tech. The acquisition also brings marquee client relationships and provides GlobalLogic with immediate access to a substantial skilled talent pool relevant to the industry.

This strategic move provides GlobalLogic with access to Mobiveil's mature embedded engineering Centres of Excellence (COE)based in five locations across the US and India, complementing existing COEs in Central and Eastern Europe. Mobiveil's competencies will enhance GlobalLogic's capabilities across embedded software, hardware and ASIC technologies. The three co-founders of Mobiveil, Ravi Thummarukudy, Gopa Periyadan, and Srinivasan Duraiswamy, will join the GlobalLogic Leadership team as part of the agreement.

Mobiveil specialises in the development of Silicon Intellectual Properties, platforms, and solutions for the networking, storage and enterprise markets. It leverages decades of experience in delivering high-quality, production-proven, high-speed serial interconnect Silicon IP cores and custom and standard form factor hardware boards to leading customers worldwide. The company has engineering development centres in Milpitas, California, Chennai, Bangalore, Hyderabad, and Rajkot, with sales offices and representatives located in Europe, India, Israel, Japan, Taiwan, the People's Republic of China, and the US.

Cisco to acquire networking and security company Isovalent

Cisco has announced that it will be acquiring Isovalent, a leader in open source cloud-native networking and security. This move aims to strengthen Cisco's secure networking capabilities across public clouds, aligning with its Security Cloud vision—an AI-driven, cloud-delivered, integrated security platform.

Isovalent's acquisition will contribute to the Cisco Security Cloud, offering advanced protection against emerging threats across any cloud, application, or workload. The collaboration will leverage the open-source power of Cilium, led by Isovalent, creating a unique multicloud security and networking capability to simplify and accelerate digital transformation journeys.

Jeetu Patel, EVP and GM of Security and Collaboration at Cisco envisions a distributed environment with security controls providing total visibility without compromising networking and application performance, made possible by the combination of Cisco and Isovalent.

Isovalent's expertise in eBPF and its development of Cilium, a leading cloud-native solution for networking and security, are key factors in the acquisition. Cisco plans to continue offering and building on Isovalent's innovations, including Cilium Mesh, Tetragon, and Isovalent Enterprise.

Stephen Augustus, Head of Open Source at Cisco, emphasises the commitment to nurturing and contributing to the eBPF and Cilium open-source communities. The acquisition strengthens Cisco's role in supporting the open-source ecosystem and accelerates innovation across cloud-native, security, and networking challenges.

Cisco and Isovalent, both leaders in networking and security, aim to provide solutions powered by eBPF technology, addressing the challenge of protecting workloads regardless of their location. Cisco commits to Cilium and Tetragon as open-source projects and plans to establish an independent advisory board aligned with the open-source community's needs.

Ciena builds 600G transmission route in South Korea for KT

Ciena has completed the construction of South Korea's first nationwide 600G transmission network for the telecommunications company KT. This project by the South Korean telecommunications company is an initiative to proactively address the rapidly increasing data traffic related to AI, cloud, and 5G, and to prepare for future services such as 6G.

The transmission network, operational since September 2023, spans over 1,000 km and is capable of transmitting 600G per wavelength in long-distance segments, connecting major cities nationwide from Seoul to Busan, Gwangju, and even Jeju Island.

Leveraging Ciena's 6500 flexible grid Reconfigurable Optical Add/Drop Multiplexer (ROADM) photonic layer with WaveLogic 5 Extreme (WL5e) coherent optics, and Manage, Control and Plan (MCP) domain controller, the transmission route establishes a robust foundation to handle rapidly increasing bandwidth needs.

Henry Kim, Regional Managing Director of Ciena North Asia emphasised Ciena's role as a pioneer in coherent optical technology, supplying equipment capable of delivering 100G and 400G services. The introduction of the 600G transmission network by KT is anticipated to offer a groundbreaking and cost-effective solution for efficiently transmitting high-capacity traffic across South Korea, thereby significantly enhancing dedicated circuit services.

Deutsche Telekom offers AI protection for company cell phones

Deutsche Telekom has introduced a new service, Appvisory Secure App Check, utilising Artificial Intelligence (AI) to enhance the security of business cell phones and tablets. The service automatically scans applications for security and data protection vulnerabilities, employing AI technology to analyse apps both before and after installation. By detecting malicious apps before they reach the device and the company network, the service enables businesses to promptly identify security issues, reducing the risk of internal regulation or GDPR violations.

The technology offers insights into app vulnerabilities, advising customers on addressing these issues and providing guidance on future app protection. Klaus Werner, Managing Director of Deutsche Telekom Business Customers, emphasises the need for real-time cyber defence in the ever-evolving landscape of mobile workplaces. Appvisory CEO Sebastian Wolters adds that the integration of Appvisory into Deutsche Telekom's portfolio enhances mobile working security.

Once installed, the service continues to monitor the app, alerting customers to potential risks during updates and facilitating the suppression of dangerous downloads. The solution also proactively orders updates when patches are available for security vulnerabilities.

As mobile service devices become lucrative targets for cyberattacks, the new service addresses the rising threat, especially in the context of increased remote work due to the COVID-19 pandemic. Payment apps on company smartphones are highlighted as attractive targets, with cybercriminals increasingly focusing on financial transactions through fraudulent emails and phishing attacks. According to BITKOM data, almost half of the cyberattacks in 2022 targeted company customer data, emphasising the critical importance of robust mobile security solutions.

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S. Krishnan
Secretary, Ministry of Electronics and Information Technology, Government of India

"Becoming self-sufficient in semiconductors may take some time"

For this 1989-batch IAS officer of the Tamil Nadu cadre, technology has always been a catalyst of change. In his earlier role as Associate Vice President at ICT Academy, he led strategic planning, national special initiatives, corporate partnerships, government projects, education technology, marketing, and advocacy. As the Secretary of the Ministry of Electronics and Information Technology (MeitY) ***S Krishnan*** *is responsible for supervising the implementation of the recently passed Digital Personal Data Protection (DPDP) Act, 2023. He is also at the forefront of driving the implementation of the country's ambitious semiconductor mission to create the component ecosystem.*

In an interaction with ***Shubhendu Parth, Thomas George,*** *and* ***Sunil Rajguru,*** *he lifts the curtain and gives a peek into the making of a new India on many fronts—from DPDP and IoT to Industry 4.0, interconnection platforms, and Make in India. Excerpts:*

What's your reckoning of the DPDP regulatory move? Are you satisfied with its progress? What implications will it have on compliance in India Inc.?
As you're aware, the DPDP Act was enacted in August. The Parliament has enacted it. It has also secured the consent of the President. Now, we are at the stage where rules are being drafted. There are several sections; in fact, almost 88 sections for which rules have to be drafted. The process of drafting the rules is nearing completion. Thereafter, we will have internal consultations and the draft will be put out for public consultation.

The Act itself has a provision which mandates that any rules under the Act have to be published for consultations before they are finalised. So, to that extent, the industry and others will get adequate opportunity to share their views on the draft. There will be adequate stakeholder consultation and hence there is no reason to be concerned. As far as industry is concerned, it is a very positive provision for them. Different sections of the Act can be brought into force on different dates. This means that based on industry consultation, and based on their level of preparedness, the government can give more time to deal with genuine difficulties while complying with the provisions.

We intend to remove difficulties and ensure the balance of interests on both sides. The Act, itself, is very important from a personal data protection angle. All of us, as citizens, you and I, will also benefit. The main feature fundamentally is that there's a formal process of consent and that your data cannot be taken without your consent. The other part of it also is about how long the data can be kept. Once the need for the data is over, they will have to get rid of it. That is what is called the 'right to forget'. I think for individuals and citizens, there is a lot of positive protection.

Another important development is the Indian semiconductor vision. We have been trying this

> In the Indian context, the challenge with Industry 4.0 lies in the substantial need for retrofitting due to the incorporation of sensors and data collection.

> India is working on building indigenous capacity for CMOS and infrared cameras and the system-on-chip mechanism, integral to IoT and devices.

since the 1980s and 1990s and always seem to miss the bus. Can we finally become self-sufficient on this front?

Becoming a self-sufficient nation may take some time because our demand is going to be very large. Let us be clear that we are the most populous country—and chips are becoming part of almost any kind of device that we use, including lights and fans and everything which now carries a semiconductor chip. And especially if we start using electric vehicles, the number of chips there will also increase. So, the demand for semiconductor chips in India is going to be very large. One should not make a very ambitious projection saying that we will be able to establish complete self-sufficiency. Production of semiconductors also includes specialised applications, ranging from being mass-produced to specifics for complex electronics and niche areas.

So, in that situation, I think it may not be realistic to expect that all our requirements will be produced domestically. What we may be doing is that in certain kinds of chips, we will be exporting and in certain kinds, we will be importing. That is why it is called the global value chain. The value chain extends across different countries, but you must ensure that the value chain is resilient and you should not be reliant on just one source for what you require. You should have a multiplicity of sources, at least two or three sources, so that if one fails you have another option in hand. Overall, we should target to establish a reliant and robust supply chain that will not get disrupted. And we must have a substantial production capacity within the country. It is also important to note that globally no country fully manufactures all components of complex electronics. At the most only 40-45% value addition is done by any one country in terms of complex electronics.

What about the sensor-based technologies? While there has been a surge in efforts towards digitalisation after the pandemic, Industry 4.0 has not really taken off in India. Why?

MeitY is not the only agency which is responsible for Industry 4.0. While we are looking at various emerging technologies, Industry 4.0 primarily relates to the manufacturing sector. So, several other entities in the Government of India are also focusing on that, along with many state governments. Many new factories are coming up that are adopting Industry 4.0—they are called Lighthouse factories.

The challenge, at least, in the Indian context with Industry 4.0 is the need for a lot of retrofitting because it involves sensors and the collection of data. Now, retrofitting is a slightly more challenging issue, because it has costs involved. It depends on the demonstration of the benefits to the industry, because fundamentally, it is in the manufacturing industry, and they should see cost advantages in actually doing it. So, the point is that we can address it and make sure that the skilling is done, and the technology is made available. We are doing that through several Centres of Excellence. Beyond that, the actual investment needs to come from the private sector.

Talking of IoT and equipment, what are the other initiatives beyond PLI?

Indeed, beyond PLI, we've taken significant steps. At a recent event in Delhi, we unveiled three camera types developed by CDAC, fostering tech transfer to private firms for manufacturing of CMOS and infrared cameras. So, we are working on building indigenous capacity for these cameras and the system-on-chip mechanism, integral to IoT and devices.

One of these cameras is designed for tracking processes in sugar mills, and monitoring the crystallisation of sugar and is adaptable to various industrial applications. Another is a standard CMOS camera similar to closed-circuit television, while the third improves nitrogen monitoring. We are permitting the private sector to take these up for large-scale manufacturing. So clearly, there is real support, not just financial support. The other important aspect is standards; we also need to address the issue of security and standardisation when such equipment is deployed.

You mentioned skill development in the context of Industry 4.0. Do we have a roadmap for the next 25 years to address emerging technology needs?

It is an important area that we are working on, especially for the new-age skills and the use of emerging technology.

> On the skill development front, the focus should be on fostering a mindset that can help the country quickly ramp up infrastructure to meet emerging needs.

However, creating a precise 25-year roadmap for this sector is challenging, given the rapid evolution of technology. How do we anticipate 25 years from now? What will be the requirement then? I think we have to be nimbler than that.

Fundamentally, the focus should be on fostering a mindset that can help the country quickly ramp up infrastructure to meet emerging needs. And technology permits it. Strong foundational education is key, emphasising not only basics but also the ability to learn themselves. That is why the new education model and foundation level have to be strong. Resilience lies in ensuring a mechanism for quick reskilling or retraining when new technologies emerge. We need to make sure this robust infrastructure is in place to support these endeavours.

Will that include collaboration with educational institutions?

Yes, in fact, under the AI mission, a number of the Centres of Excellence will be established and coordinated by higher education. We are collaborating with educational institutions across a wide spectrum.

Speaking of security, a lot of refurbished equipment is being sent to India. Is the country becoming a dumping ground, particularly in terms of security?

We are mindful of this issue. However, we have not received any specific complaints about the influx of refurbished equipment into India. Inputs from MAIT and other entities suggest a significant opportunity for India to engage in the repair and refurbishment market. What this means is that the equipment comes in, it is repaired and then sent back with value addition. This is very people-intensive and can generate a lot of jobs. We have a pilot project underway with MAIT to understand the operational aspects of this.

This initiative is a crucial component of the reuse cycle, contributing to the circular economy. But it also has an e-waste angle, so the Ministry of Environment and Forest is involved. It also involves Customs and hence we have to coordinate with multiple agencies to build this repair ecosystem.

We are curious about generative AI. Is it the flavour of the season? Are people using it? Any views from your side?

It is good as long as it doesn't do any harm. There's an issue with deep fakes. That's problematic. And even in the US, they have an issue with deep fakes. So everybody across the world has an issue with the wrong use of AI when it creates user harm. We're very clear that we have to take action and look at it differently. But in addition to large language models, AI and other things can also be used for a lot of scientific models. The possibility of using them in scientific models is huge. And that can generate huge productivity gains in a lot of those key areas.

Has there been any thought process in terms of the ethical use of AI?

We are concerned about facets like deep fakes and everything else. Till such time that the Digital India Act is out – the existing provisions will apply through those rules. Otherwise, if it's unlawful activity, then naturally we have to take apt action.

Can you share something about the notice given to a few social media platforms on child pornography?

It was not a notice. What they have been told is under provisions of the IT Act. The Safe Harbor is subject to certain conditions. One of the conditions is that they have to exercise due diligence and ensure that no harmful content is carried out and they are not violating any law. We only brought to their notice that they should not take the Safe Harbor clause for granted. If a company does not exercise adequate due diligence and ensure that undesirable content is completely removed, the platform could be falling foul of the law.

We have alerted them about their responsibilities to conduct due diligence. If they fall flat and if we find such occurrences, then the platform or company may be liable as an intermediary. There is nothing like a cut-off date for this. The point here is very simple: they have to take responsibility. The companies cannot wash their hands off by saying they have no idea what is being put on their platform.

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LT GEN DR S P KOCHHAR

NAVIGATING THE COMPLEX CYBERSECURITY TERRAIN

As technology continues to advance and the security landscape becomes more interconnected, businesses must adopt a multi-pronged strategy to deal with it

In today's ever-accelerating technological landscape, the intricate relationship between emerging technologies and the imperative of cybersecurity is more pronounced than ever. As our world becomes increasingly interconnected through digital systems and innovations, the need to safeguard our digital existence becomes a paramount concern.

In this era of unparalleled technological progress, the boundaries between the physical and digital worlds blur as data flows ceaselessly through our interconnected devices and systems. The very fabric of our society, from finance and healthcare to transportation and communication, relies heavily on these technological marvels. Yet, with the immense benefits of these innovations come equally significant risks. The vulnerabilities inherent in our interconnected world can expose us to a myriad of threats, from data breaches and cyberattacks to identity theft and financial fraud.

Evolving digital technologies such as edge computing, blockchain, artificial intelligence (AI), digital tokens, and the Internet of Things (IoT) also bring in multifaceted challenges and opportunities. It is also important to deal with crucial aspects of skilling, awareness, policy, and the convergence of technologies and telecommunications, to get a clear view of the current cybersecurity landscape.

IMPACT OF NEW-AGE TECHNOLOGIES

Emerging technologies are transforming the way businesses and individuals interact with data and information. Edge computing, for instance, represents a significant shift in data processing, moving it closer to the source. This shift reduces latency, saves bandwidth and enhances privacy. However, it also presents security challenges, with increased attack surfaces requiring adaptable security strategies.

Blockchain, known for ensuring data integrity through its immutable ledger system, finds applications in finance, supply chain management and identity verification. Yet, it poses security concerns such as smart contract vulnerabilities, 51% attacks, DeFi exploits, cross-chain attacks and the looming threat of quantum computing.

Artificial Intelligence (AI) is another game-changer. Its predictive analytics, anomaly detection and automation capabilities are invaluable in various sectors. However, AI introduces security threats like sophisticated phishing and AI-powered malware. Ethical frameworks for AI development and deployment are crucial.

The emergence of digital tokens and currencies, like Bitcoin, has challenged traditional financial models. While they offer decentralised transaction systems, they also

> Artificial Intelligence plays a dual role in cybersecurity. It acts as both a defence tool and a potential weapon for attackers.

> The emergence of digital tokens and currencies, like Bitcoin raise security risks related to wallet security, exchange vulnerabilities and regulatory challenges.

raise security risks related to wallet security, exchange vulnerabilities and regulatory challenges.

DATA SECURITY IN THE NEW ECOSYSTEM

The rise of these technologies has led to an unprecedented increase in data generation, necessitating robust data management and security strategies. Data security now requires a proactive approach, emphasising secure coding practices and system design. The principle of security-by-design advocates for integrating security considerations right from the initial stages of system and software development.

There are several examples of security breaches resulting from neglect in the early stages of development that highlight the importance of this approach.

Marriott: In March 2020, Marriott announced a security incident that compromised the data of more than 5.2 million guests. Hackers used the login credentials of two employees to steal sensitive information from a third-party application. This was the second time Marriott suffered a data breach within two years, highlighting the importance of robust security measures from the onset.

EasyJet: In May 2020, EasyJet revealed it had been the target of a cyber-attack that exposed the email addresses and travel details of nine million customers The airline also confirmed that 2,208 customers had their credit card details and CVV security codes accessed.

Electronic Arts: Hackers broke into the systems of Electronic Arts, one of the world's biggest video game publishers, and stole source code used in company games. The company made the announcement earlier this month.

McDonald's: McDonald's announced that it was affected by a data breach, which exposed the private information of customers and employees in South Korea and Taiwan.

Such incidents underscore the importance of prioritising security from the early stages of development. Neglecting to do so can lead to significant problems, including poorly built security processes, outdated software, lack of infrastructure isolation and inadequate threat protection.

THE EVOLVING SECURITY RISKS

IoT and Edge devices have become ubiquitous, integrating into every aspect of our lives. From healthcare, like patient monitoring systems, to smart cities with traffic control, and home automation including smart thermostats and security systems, they offer convenience and efficiency but also introduce numerous security challenges.

The diversity and complexity of these devices, coupled with limited security features, create significant security vulnerabilities. Implementing robust security protocols, regular firmware updates, and secure network architectures is necessary to mitigate these risks.

AI plays a dual role in cybersecurity. It acts as both a defence tool and a potential weapon for attackers. Balancing automation with human expertise and developing ethical frameworks for AI in cybersecurity are critical steps in ensuring effective defence against evolving threats.

SKILLING AND AWARENESS

The cybersecurity skills gap is widening due to the growing demand for skilled professionals. Strategies for workforce development include specialised training programs, certifications, industry-academia partnerships, clear career pathways and mentorship programs. Skilled cybersecurity professionals are needed to oversee AI systems, provide context to AI findings, and make critical decisions, especially in complex threat scenarios.

End-users are the first line of defence against cyber threats. Educating them about common threats like phishing, malware and social engineering tactics is crucial. Regular workshops, online courses and security advisories keep users informed and vigilant. Organisations should foster a culture of security where cybersecurity is seen as a shared responsibility.

End-users are the first line of defence and educating them about common threats like phishing, malware and social engineering tactics is crucial.

IN BRIEF

- As technology advances, the cybersecurity landscape is becoming more intricate, demanding a multifaceted approach for a secure digital future.
- Emerging technologies like edge computing, blockchain, AI, IoT, and digital tokens offer opportunities but also pose security challenges.
- Security breaches, exemplified by incidents like Marriott and EasyJet, emphasise the importance of prioritising security from the early development stages.
- Robust protocols, firmware updates, and secure architectures are essential for mitigation.
- Organisations need to focus on workforce development, user education, and comprehensive policies for effective cybersecurity.

POLICY AND REGULATIONS

A comparative analysis of global cybersecurity policies and India's evolving framework highlights the need to balance global best practices with local needs. Comprehensive policies that cover emerging technologies and a collaborative, interdisciplinary approach involving government, industry, academia and civil society are crucial. Effective cybersecurity policies require the involvement of various stakeholders and must address emerging technologies. Public-private partnerships are key to successful policy implementation.

TECH CONVERGENCE AND TELECOM

Seamless integration between technology and telecommunications is vital for efficient data flow and management. Strategies for effective collaboration include information sharing, joint ventures and standardisation of security protocols. The development of international standards for cybersecurity in telecommunications is also essential.

Balancing security with innovation is essential to ensure that integration does not stifle progress. User-centric design and responsiveness to user needs are paramount. Organisations must prioritise user experience while maintaining robust security measures.

As technology continues to advance, the cybersecurity landscape becomes more complex and interconnected. Addressing these challenges requires a multi-faceted approach that encompasses technology, workforce development, awareness, policy and collaboration. By staying vigilant and proactive, organisations can navigate this landscape successfully and ensure a secure digital future for individuals, organisations, and nations. The evolving cybersecurity landscape demands continuous adaptation and a commitment to security at all levels of society.

The author is the Director General of the Cellular Operators Association of India (COAI). A decorated military veteran, he retired as Signal Officer in Chief, the head of the ICT wing of the Indian Army. He also served as the first CEO of the Telecom Sector Skill Council (TSSC)..

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  - Mike Cannon-Brookes, Co-founder and Co-CEO, Atlassian
- **It's not 'if' you will catch a cold. It's about bouncing back.**
  - Praveen Cherian, CEO, STL Global Services
- **For a managed service provider, cycle of innovation is almost every day.**
  - Praveen Cherian, CEO, STL Global Services
- **The shower knob problem of green cloud.**
  - Tracy Baldwin, Global Lead, AWS sustainability

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Taking flight: India's data centres in 2024

AI, DPI, and data-driven digitisation of the country's economy make data centres a key driver of tech investment, positioning them for substantial growth

BY VERNIKA AWAL

On October 31, 2022, Sunil Gupta, the chief executive and co-founder of Yotta Data Services, met members of the press at the opening of one of the firm's data centres. While one would imagine the opening of a data centre for a company that deals in data centre operations is regular fare, the announcement was a significant one—this data centre campus in Greater Noida was one of the first such hyperscale facilities in northern India.

Yotta's move signalled what many at the time had predicted—the time had come for data centres to shoot for the stars. The company's data centre, back in October 2022, saw only one of six planned buildings being inaugurated. Just one building had a capacity of 28.8MW of IT load and took investments of Rs 6,500 crore. Once all six buildings are up and running—the second one is close to completion now, the Greater Noida data centre would have a total capacity of 160MW. The company has committed an investment of Rs 39,000 crore in the next five years.

The company, however, is not an outlier. Over the past few months, the rise of tech legislation in the country, proliferation of generative AI leading to massive data demand and digitisation of every sector further accelerating data volumes, suggest that in 2024, India's data centre market will lay the foundation for what could be its greater growth phase to date.

PROJECTING THE DEMAND

Real estate consultancy JLL India's half-yearly data centre sector update, published last on November 23, stated that in three-and-a-half years until the end of calendar

> By 2026, India is likely to add nearly 700MW of data centre capacity—requiring up to 8.8 million square feet, or over 200 acres of land, in the process.

year 2026, India is likely to add nearly 700MW of data centre capacity—gobbling up 8.8 million square feet, or over 200 acres of land, in process. For this, JLL predicted capital expenditure of USD 4.4 billion—around Rs 37,000 crore—within this stipulated time.

Going by industry norms, this would just be investments towards land and real estate—taking IT equipment expenditure into account, data centres may take up total cumulative investments that are near a benchmark figure of Rs 2 lakh crore. In 2024, a chunk of this will contribute to bringing India's active data centre capacity to nearly 1318MW, as per JLL.

All of this suggests prolific demand for data centres in the country, thereby placing operators in this sector at the cusp of meteoric growth. Seizing this opportunity, companies are now deliberating on strategies to fuel this growth.

DIVERSIFYING BETS

Pretty much every data centre operator in India has announced capacity expansion plans and investments for the India market. Media reports quoting Abhijit Dubey, Global Chief Executive – Data and Infrastructure Services conglomerate, NTT Limited indicate that the company is working on doubling its operational data centre capacity from 16 working centres by March this year. The company has also announced a USD 2.5-billion investment plan for India, which includes data centres, subsea cables and more.

On August 10, California-headquartered data centre firm Equinix announced a USD 42 million (~Rs 350 crore) investment outlay to expand its latest scaled data centre operation in Mumbai, called MB4. In June 2022, the company also announced a USD 86-million investment to establish a larger data centre facility in Mumbai itself, called MB3, which is expected to become operational in mid-2024. While MB3 will have 4,150 total cabinets in terms of server capacity, MB4 is projected to house 700 such cabinets.

Speaking to a business newspaper, Sumit Mukhija, Chief Executive Officer, ST Telemedia Global Data Centres (GDC), in which Tata Communications holds a minority stake, said that the company plans to invest USD 1 billion (~Rs 8,300 crore) by 2027 to expand its presence. The company's announced data centre capacity is nearly 300MW, with 100MW under construction. The Singapore-headquartered company has nine such facilities in the country.

Similarly, Sridhar Pinnapureddy, Founder and Chairman of homegrown data centre major CtrlS, has indicated that the company plans to invest USD 2 billion in six years, to add 300MW in the operational capacity of its data centres. At the moment, CtrlS has a capacity of 234MW operational across seven cities in India. Media reports also indicate that Yotta is imminently planning investments of Rs 16,000 crore (~USD 1.9 billion) to fund their data centre expansions.

FACTORS FUELLING GROWTH

JLL's November 2023 report pegged five clear reasons to fuel growth for data centres in India, "Increasing digital growth, Digital Public Infrastructure (DPI), 5G rollout, new applications of Artificial Intelligence (AI) and Machine Learning, (and) data protection laws and state incentives."

Looking at each avenue, it is clear why the quantum of investment in India from data centre operators is steadily increasing. Digital growth in India was accelerated in the country by the COVID-19 pandemic, which led to digitisation of India's payments infrastructure, onboarding of local shops into the e-commerce fold, and the inception of the Open Network for Digital Commerce (ONDC) to further take this forward.

In the banking and financial services sector, the digitisation of the Know Your Customer (KYC) process, as well as the complete digitisation of lending, credit and all financial services procedures has significantly boosted demand for data centres and outsourced IT services.

The proliferation of the Unified Payments Interface (UPI) is a key contributing factor in this regard. Digitised payments through UPI have ensured that contactless digital payments crossed 10 billion monthly transactions in September last year. With increasing proliferation,

More firms are seeking cloud-based services to automate business processes—and use data for both core and supplementary business functions.

IN BRIEF

- Digital surge, DPI, 5G rollout, AI applications, and data protection laws fuel India's data centre market growth, attracting significant investments.
- Digital transformation, UPI proliferation, and 5G adoption are driving the demand, especially in finance and manufacturing sectors, boosting data centres.
- The rise of generative AI applications is fueling demand for cloud services, leveraging structured enterprise data for enhanced intelligence and automation.
- Robust data protection laws and regulations are driving companies to localise operational data, fueling data centre expansions in India.
- Players like CtrlS, Equinix, NTT, ST Telemedia, and Yotta have announced substantial investments, reflecting the sector's massive growth.

demand for data centres has been reinforced as more individuals from India's billion-plus population demographic continue to migrate online.

The rollout of 5G services is further accelerating this. With 5G, more enterprises, especially in the manufacturing sector, are coming on board with the demand for smart factory automation, while consumer 5G services are also seeing increasing demand for data through telecom network operators as streaming services continue to replace traditional satellite-driven broadcast platforms. The advent of satcom services in 2024 is expected to further drive data demand forward, thereby rationalising data centre investments in the country.

The big market mover of 2023 was, however, AI. With the advent of generative AI, an increasing number of companies are betting on the use of structured enterprise data for business intelligence. More firms are seeking cloud-based services, which in turn use data to automate business processes—and use data for both core and supplementary business functions.

All of this is tied together with the rise of data legislation in the country. India, in August last year, notified its first dedicated technology law—the Digital Personal Data Protection (DPDP) Act. Coupled with the IT (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, India now has a robust set of regulations that mandate how data is handled and operated across the country. In the wake of these regulations, as well as the impending Digital India Act that could be legislated later this year, more companies are expected to localise operational data in the country.

Data localisation, therefore, could be the pivotal focus point of data centre operators increasingly betting on market expansions in the country. Just between the five data centre operators quoted above, planned investments of USD 7.8 billion (~Rs 65,000 crore) have been announced by foreign and domestic companies alike). This quantum is only likely to increase further, and 2024 would be a pivotal platform for these initiatives to take off.

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Riding high on the digital transformation wave

Hidden like a backyard, data centres often go unnoticed. Yet, with rising demands and green expectations, they are set for increased attention and action

BY PRATIMA HARIGUNANI

What happens when we chew more apps, juggle more devices, stuff our lives with more technology and go crazy in the fast cruise of digitalisation? All that has to be powered from somewhere. All those pipes and engine rooms must be working furiously all the time.

If 2023 was any glimpse, and if what is coming in 2024 is watched closely, there would be no doubt that 'all that' is set to explode not just in demand but in capacity and consciousness too. Data centres are sputtering all the power that IT needs, pushing forth businesses on the new oceans of Artificial Intelligence (AI) and digital transformation—and India is no exception.

EXPLOSIVE GROWTH, EXCITING DRIVERS

A recent report by Dell'Oro Group indicates that the worldwide data centre capex is forecast to rebound to 11% growth in 2024 as select hyperscale cloud service providers return to an expansion cycle and the spending freeze in the enterprise markets starts relenting. The India data centre market size has been slated to grow from

"The implementation of data protection and localisation regulations is playing a pivotal role in propelling the growth of data centres in the region."

Devroop Dhar
Co-Founder, Primus Partners

USD 6.12 billion in 2023 to USD 10.89 billion by 2028, as augured by a forecast from Mordor Intelligence.

In India, data centre infrastructure is growing exponentially, and there is a growing preference for the Cloud and increased data consumption and generation by over half a billion digital users. Demand for new data centres is enormous in India, driven by the hyperscale facilities key internet players, such as Amazon Web Services (AWS), Microsoft, Google Cloud, and Alibaba Cloud, demand to power their clouds.

Dell'Oro outlook further highlights that server and storage system revenue is set for growth greater than 20% in 2024, while network and physical infrastructure revenues grow in single digit. The hyperscale cloud service providers could increase their data centre capex by 13% in 2024.

It is not hard to guess where this demand for more data centre coal is coming from. The ship of technology is moving at a staggering speed on waters like AI, Cloud and mobility. Interestingly, India is among the major data centre players in the APAC region. Also, as enterprises migrate to the Cloud, it drives more data centre muscle.

Devroop Dhar, Co-Founder, Primus Partners seconds that wave. "The data centre market in the APAC region is experiencing notable expansion, primarily fueled by emerging markets like India, Malaysia, and Thailand. India, in particular, is poised for substantial growth, with an anticipated doubling of its total data centre capacity in the coming years, positioning it among the fastest-growing markets worldwide."

He also adds how the proliferation of Internet usage driven by 5G, the prominence of e-service delivery encompassing e-commerce, and the implementation of data protection and localisation regulations play a pivotal role in propelling the growth of data centres in the region.

According to a CBRE report, Global Data Centre Trends 2023, there was continued demand across industry verticals as businesses and governments move towards digitalisation and emerging markets such as Mumbai and Seoul recorded take-up growth. The report noted that the rapid growth of AI, along with other modern technologies, such as streaming, gaming and self-driving cars, will spur strong data centre demand; spawning innovations in data centre design and technology.

Vikas Sharma, Founder and Director, Hi-Com also brings in the part of how the implementation of the Data Protection Bill (DPDP) in India affects this space. "Organisations were expected to adapt their data handling processes to comply with the regulations, potentially influencing data centre strategies."

"Yes, there is a huge surge in India to modernise the data centre, irrespective of whether it is Public Cloud or Private Cloud. It is a demand to run your business seamlessly otherwise you will be left behind in the business growth race," points out Bhoopendra Solanki, Chief Information Officer, Sakra World Hospital.

All good and starboard then? Not really. A lot of new winds and factors are coming into play as the demand for more data centre coal piles up. It is kind of contradictory too as there is a need for more of this coal, and it needs to be green.

IMPERATIVES AND IMPEDIMENTS

Data centres do not come up like fairies or genies. This coal has to be mined from difficult places and shoved into engines with expert hands. There are factors like real estate, space management, power use, carbon impact and utilisation that have to be considered here.

As the CBRE report pointed out that there was a worldwide shortage of available power is inhibiting the growth of the global data centre market. Sourcing enough power came up as a top priority of data centre

"Earlier, servers needed a cooled environment, but now, cooling mechanisms are integrated into the servers, leading to significant energy savings."

Bhoopendra Solanki
CIO, Sakra World Hospital

ZOOMING IN ON INDIA

- India's data centre market is highly concentrated due to higher initial investments and low availability of resources.
- The Government of India and various state governments are revising their data centre policies to support the infrastructural growth of data centres in India through tax subsidies.
- The IT ministry in India intends to provide up to Rs 15,000 crore (~USD 1.83 million) as an incentive under the national policy framework for data centres.
- The government plans to invest up to Rs 3 lakh crore (~USD 36.5 million) in the data centre ecosystem, over the next five years.

Source: Mordor Intelligence

operators across North America, Europe, Latin America, and Asia-Pacific.

Also, note that data centre establishment in India is cost-intensive which can be quite a barrier to entering the industry for many data centre companies. Considering the prevalent norms for commercial buildings applied to data centres, one stares at issues like wastage of space and increased cost. "Other factors like high real estate costs, expenses on improving wide area network connectivity, and increased equipment costs add to the weight of heavy Capex in the sector," the Mordor Intelligence Report highlights.

However, the biggest pressure comes in the form of a clear and imminent need for data centres to embrace the sustainability model. Dhar concurs that the current focus should shift toward the environmental sustainability of data centres, a critical aspect as the industry aims for Net Zero emissions.

Speaking to Voice&Data, Tracy Baldwin, Global Lead, AWS Sustainability pointed out that the company is building the most sustainable infrastructure it can to deliver services to customers. "The core of what we focused on from the beginning is efficiency across every aspect of our infrastructure. And that is everything from designing our data centres and our hardware to modelling and tracking of performance to make sure that we continue to identify ways to increase efficiency."

When big players like AWS embrace initiatives to use lower carbon, concrete, and steel in their data centres, it confirms that 'going green' is not a footnote anymore. "Lower carbon concrete, of course, needs to be a localised solution since you do not want to ship concrete. When we go to a new region, we will look at local climate patterns, to see what is the most efficient way to cool our data centres. We also have different designs, you know, depending on, we consistently update our design for data centres,

"Data centres are adopting renewable energy sources and energy storage solutions to enhance energy efficiency and reduce environmental impact."

Vikas Sharma
Founder and Director, Hi-Com

so we get more efficient with each design generation," Baldwin explains.

The carbon impact consideration is emerging as a crucial factor in the establishment of new data centres in India, although it is still in its early stages, underlines Dhar. "Major players in the data centre industry are increasingly emphasising the use of green and renewable energy to meet their energy requirements. Additionally, there is a concerted effort to incorporate green building practices, with some data centres obtaining LEED certification."

But he also points out how Scope 3 emissions encompass a wide range of areas and pose challenges in terms of measurement. "Bodies like the Bureau of Energy Efficiency (BEE) may consider issuing new guidelines and best practices for enhancing the energy efficiency of data centres, addressing a current industry need. Government incentives for private entities establishing data centres should also factor in the broader spectrum of environmental considerations when calculating incentives, presenting a proactive approach to drive sustainability in the industry."

Sharma observes that data centres are addressing infrastructure challenges through innovations in design and technology. "The rise of edge computing has prompted the development of smaller, decentralised data centres, reducing the need for extensive centralised infrastructure. This decentralisation enhances performance and responsiveness while mitigating latency issues."

Solanki provides an optimistic perspective: "Today's technology, such as energy-efficient Hyper-Converged Infrastructure (HCI) options and smart racks, is advanced. In the past, servers needed a cooled environment, but now, cooling mechanisms are integrated into the servers themselves, leading to significant energy savings."

WHAT COMES NEXT?

As we move into 2024, a lot of this appetite and issues will manifest themselves on the ground.

As for CIOs and industry players, the surge comes with a lot of responsibility. Solanki recommends that irrespective of whether the business is using a Cloud or private and on-premises data centre, it should have BCP for the data centre in place. "It is very important to keep the heart (data centres) healthy. There should be data centre refresh planning on regular intervals like we refresh our production environment every four to five years and this environment becomes a development environment," he says.

Sharma is confident of the progress the sector is making. "There has been a notable increase in both domestic and international companies investing in establishing data centres within the country. Additionally, the Government of India has launched initiatives like the National Digital Communications Policy (NDCP) to promote the growth of digital infrastructure, including data centres. The geographical distribution of data centres is also noteworthy."

Dhar feels that the year would see significant capacity addition, with more than 500MW capacity expected to be added, though most of the capacity addition would be concentrated in Mumbai/MMR, Delhi/NCR, Chennai, Bengaluru and Hyderabad. "Focus now needs to be on the greening of data centres and achieving carbon neutrality, which would be a critical factor going forward."

If all goes as expected, then the backyard of IT would cease to be what it was. It would stop being hidden and non-consequential to many. It could become the kitchen. Still not in the front but always on the top of one's mind, and in action.

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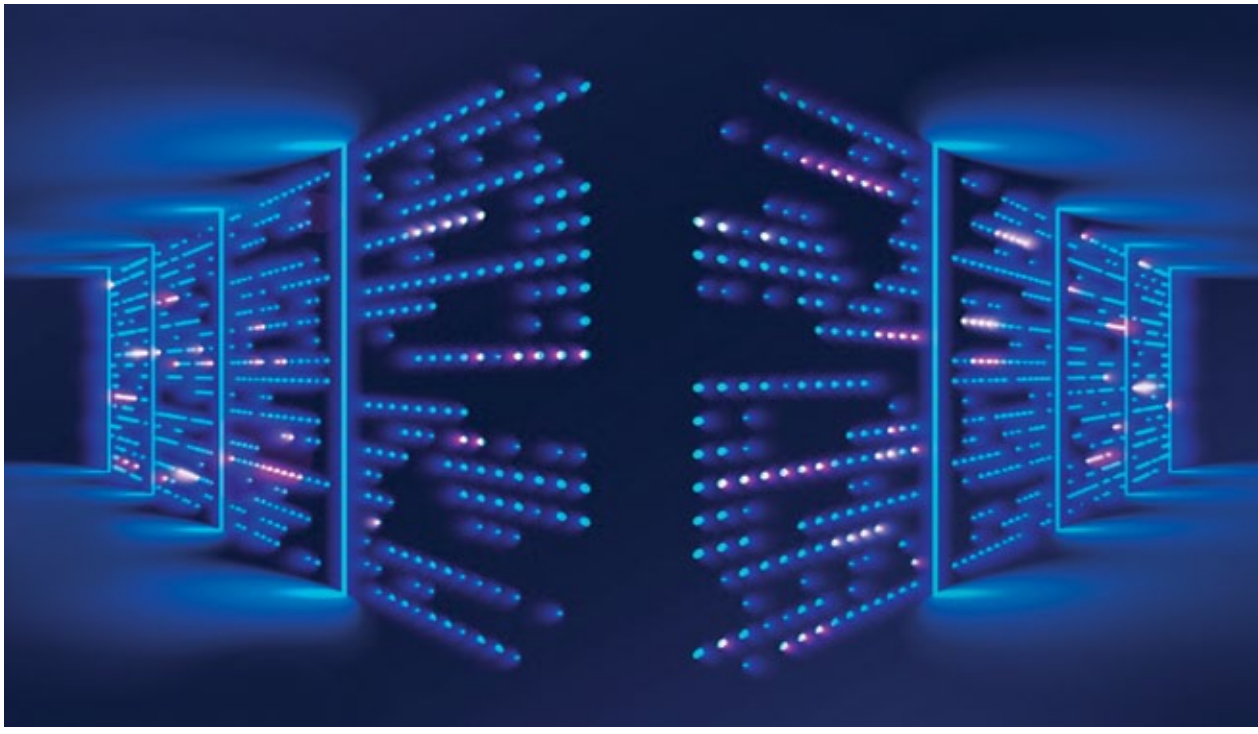
A shift towards the 'distributed' future

The next-gen data centres are relying on software-defined technologies as their logical layer, allowing better control of physical and virtual resources



BY RAJ PAREEK

In the realm of next-generation data centres, automation takes centre stage, streamlining workflows and alleviating the burden of manual upkeep. The future is unpredictable, but one undeniable truth is the enduring presence of data centres. Positioned as one of the most secure industries, they boast a projected Compound Annual Growth Rate (CAGR) of 8% between 2023 and 2030, placing them at the forefront of the digital revolution. As businesses pivot from traditional data centres to the cloud, Gartner foresees that, by 2025, over 50% of global enterprises will embrace a serverless platform. For those who have deferred migration, the contemplation arises: Is the investment worthwhile for their business?

Data centre requirements vary based on factors such as structure, physical limitations, density requirements, and more. This article explores four common types of data centres: onsite, colocation facilities, hyperscale, and edge data centres, providing insights into their use cases and industry trends.

These data centres incorporate advanced technologies such as robotics, Artificial Intelligence (AI), Internet of Things (IoT), Robotic Process Automation (RPA), quantum computing, 3-D printing, 5G wireless networks, virtual reality, augmented reality, and blockchain.

As businesses shift to the cloud, Gartner predicts over 50% global enterprise adoption of serverless platforms by 2025.

IN BRIEF

- HiveDisk ensures top-tier data security by encrypting and distributing across multiple devices, enhancing redundancy.
- With a distributed network (hiveNet), data is retrievable even in device failures, ensuring uninterrupted accessibility.
- HiveDisk democratises cloud storage, offering an affordable solution for businesses, startups, and individuals.
- Utilising idle device capacities, hiveNet reduces the need for additional data centres, promoting eco-friendly practices.
- Choosing hiveDisk means joining a movement prioritising data security, autonomy, and a user-controlled digital world.

The first half of 2023 witnessed robust growth in the data centre market; however, many major and secondary markets grapple with a supply and demand imbalance, resulting in a shortage of colocation space and escalating prices. The prevailing trend is shifting towards constructing self-owned data centres due to reasons like vendor reduction, customisation, and access to renewable energy resources. The adoption of prefabricated, modular designs is becoming commonplace to enhance speed and efficiencies through standardisation.

SIGNIFICANT CHALLENGES

While data centres stand as some of the most sophisticated infrastructures, they grapple with inefficiency and low equipment utilisation rates, with security being another major concern.

In a broader context, Uptime has observed a consistent decline in the outage rate per site, as evidenced by four surveys of data centre managers and operators conducted from 2020 to 2022. In 2022, 60% of survey respondents reported experiencing an outage in the past three years, a decrease from 69% in 2021 and 78% in 2020.

Many organisations strive to simplify or downsize their data centres, but the objective is not for them to disappear entirely. Administrators can explore as-a-service options and cloud solutions to offload specific applications. According to Gartner, by 2025, it is anticipated that 85% of enterprises will shut down their traditional data centres.

The rapid growth of AI, coupled with other modern technologies such as streaming, gaming, and self-driving cars, is expected to drive continued strong demand for data centres and challenges too.

EMERGING TRENDS

In the early days of computing, data storage involved physical methods like punch cards and magnetic tapes. Even after room-filled computers, the process remained physical, relying on hard drives and external devices.

Today, many of us unknowingly store data in the Cloud, a network of remote servers allowing access from any device with an internet connection. These servers, commonly known as data centres, are crucial to our digital lives.

The transformation to cloud storage was gradual, and the journey continues. As we enter a new era, it is essential to consider Amara's law: "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."

THE DC TIER

TIER 1 (Basic capacity)
A Tier 1 data centre is the simplest with an uptime of around 99.671%, translating to 28 to 29 hours of downtime annually due to limited redundancy. Suitable for small businesses with basic needs, Tier 1 centres are cost-effective but lack the reliability needed by businesses requiring constant uptime and failproof service.

TIER 2 (Redundant capacity components)
A Tier 2 data centre has an uptime of 99.741%, reducing downtime to not more than 22 hours annually. While maintaining a single path for power and cooling like Tier 1, it includes some redundant components, making it more reliable. Suited for mid-sized businesses, Tier 2 centres offer improved performance with redundant hardware and software without incurring prohibitively high operational costs.

TIER 3 (Comprehensive redundancy)
A Tier 3 data centre, ideal for larger companies, boasts an uptime of around 99.982%, minimising downtime to 1.6 hours annually. Featuring comprehensive redundancy, multiple paths for power and cooling, and the ability to function during maintenance, Tier 3 centres provide superior reliability. They are often chosen by law enforcement, healthcare facilities, and organisations prioritising reliability.

TIER 4 (Fault tolerant)
Tier 4 data centres, selected by mega enterprises, achieve uptime percentages of 99.995%, equating to 0.5 hours of downtime yearly. With 96-hour protection from power outages and extensive redundancies, Tier 4 centres maintain consistent performance despite equipment failures. While operating costs are high, organisations with resources opt for enhanced performance and reliability.

TIER 5 (Sustainability factor)
A Tier 5 data centre, meeting Tier 4 requirements and more, features waterless operation, air pollutant detectors, securable server racks, and energy system monitors. Preferred for local and renewable power projects, Tier 5 centres offer unique environmental benefits, catering to organisations focused on sustainability.

Initially seen as a convenient way to access files, cloud storage's impact goes beyond convenience. Businesses now heavily depend on it, reshaping workflows. This shift raises concerns about data security, privacy, and the implications of AI. Addressing these challenges requires the right approach, and that is where hiveDisk comes in.

EMBRACING THE FUTURE

Cloud storage has evolved into an integral component of digital lives, furnishing a convenient means for individuals to store, access, and share data. Nevertheless, traditional cloud storage services often confront challenges encompassing elevated costs, restricted storage capacity, and apprehensions related to data security and privacy. These challenges have prompted the exploration of innovative solutions poised to redefine the approach to storing and accessing digital data.

In the progression of cloud storage, one name stands out—hiveDisk. This is not a byproduct of some technological era; rather, hiveDisk emerges as a timely solution addressing collective concerns about security and privacy. Opting for hiveDisk signifies selecting a pathway for file storage that envisions a future where cloud storage is accessible, secure, and under the user's control.

This is not just about data stored in some remote data centre; the essence of the cloud persists even when opting for alternatives to traditional data centres. HiveDisk operates on a distinct cloud paradigm: a distributed network known as hiveNet. This network disseminates data across a hive of computers.

HiveNet taps into the latent computing capacities of devices worldwide. Simply put, instead of conducting computational tasks in a singular centralised location like traditional data centres, hiveNet distributes these tasks across numerous globally connected devices. This approach augments efficiency, reliability, and sustainability.

The underlying idea revolves around the fact that many computers worldwide (including personal computers and servers) remain idle for a significant duration. During this idle period, these devices possess unused computing capacities, a resource which hiveNet aims to harness. This

> HiveDisk signifies a pathway for file storage that envisions a future where cloud storage is accessible, secure, and under the user's control.

strategy allows hiveNet to furnish cloud computing services at a substantially lower cost, concurrently reducing energy wastage associated with idle devices.

This innovative approach ensures the security of data by encrypting and distributing it across multiple devices, enhancing data availability and redundancy. Even in the event of device failure, data remains retrievable from other devices within the network.

WHY HIVENET AND HIVEDISK?

When users opt for hiveDisk, they are not just embracing a service; they are becoming part of a movement—a hive that prioritises the security and autonomy of data. Every contribution matters, collectively building a secure, robust, and user-controlled digital world.

hiveDisk represents more than just the future of cloud storage; it embodies community. The firm believes it is the right way to store files, aligning with the global shift towards sustainable digital ecosystems by utilising the untapped capacities of existing devices. This environmentally conscious move reduces the necessity for additional data centres and the associated carbon emissions.

Security, accessibility, affordability, and sustainability form the foundation of hiveDisk. By offering a cost-effective solution, hiveDisk democratises cloud storage, making it accessible to a broader audience. This democratisation has the potential to drive innovation and growth, underscoring the significance of hiveDisk.

IMPACT ON CLOUD STORAGE

The introduction of hiveNet and hiveDisk into the cloud storage market promises to disrupt the status quo. By providing a distributed, secure, and cost-effective solution, Hive is positioned to challenge traditional cloud storage providers. Its unique approach to utilising unused storage capacities not only reduces costs but also promotes a more sustainable and efficient use of digital resources.

Sustainability: In today's digital age, sustainability is a growing concern. The energy consumption of data centres, the backbone of traditional cloud storage services, significantly contributes to global carbon emissions. HiveNet and hiveDisk address this by utilising the unused capacities of existing devices, reducing the need for additional data centres. This approach makes cloud storage more sustainable and aligns with the global push towards an environmentally friendly digital ecosystem.

Security and accessibility: HiveDisk addresses security and accessibility, two critical aspects of cloud storage, through its unique data storage approach. By encrypting and distributing data across multiple devices, hiveDisk ensures data is secure and always accessible. Even in the event of a device failure, the distributed nature of hiveDisk's storage system allows retrieval from other devices in the network—a significant advancement in cloud storage.

Economic impact: By offering a cost-effective cloud storage solution, the Hive platform makes digital storage accessible to a broader user base. Small businesses, startups, and individuals, previously hindered by high costs, can now leverage the distributed cloud at a fraction of the price. The distributed nature of the platform allows users to contribute idle storage from their devices, offsetting monthly plans and democratising cloud storage. This democratisation has the potential to drive innovation and economic growth.

As the generation and storage of digital data continue to increase, the need for efficient and secure cloud storage solutions will grow. In this evolving landscape, Hive leads the way, shaping the future of cloud storage and redefining digital experiences.

Reflecting on Roy Amara's quote, it is evident that the impact of technologies like hiveNet and hiveDisk on cloud storage may be underestimated now, but their long-term effects will likely be profound. As the boundaries of what is possible with cloud storage are pushed, Hive is not just storing data; it is shaping the future.

The author is a Management Executive with Crescon Projects.
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[GUEST COLUMN]
DATA CENTRE

DRIVING TRANSFORMATION

By blending local expertise with its expansive global reach, STT GDC India is steering the nation's data centre technology landscape

BY SUMIT MUKHIJA

A co-location data centre services provider in India, ST Telemedia Global Data Centres (India) has been designing, building, and managing operations for more than two decades. It currently manages one of the largest white space areas, with more than 300MW of critical IT load spread across 28 facilities, including those under development, across 10 cities in India.

The company stands as a trailblazer in data centre innovation ,leading the way on AI and HPC innovation. The specialised proficiency in high-density computing and liquid-cooled servers perfectly caters to high-power demands, bolstered by the partnership with High Performance Computing (HPC) OEMs, propelling the concept of Sustainable AI Factories worldwide. The liquid-cooled GPU setups have been launched in Singapore and India, with plans for global expansion.

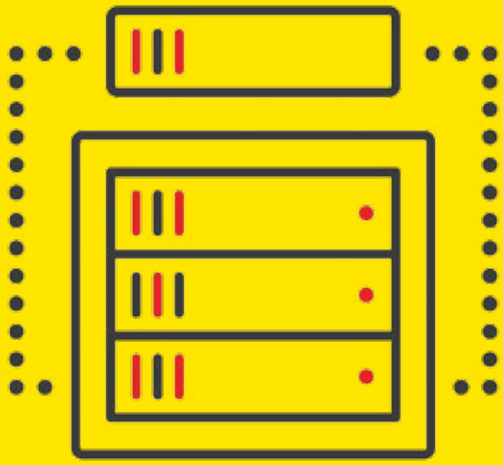
The company's forward-looking edge computing strategy revolves around establishing network-dense facilities not only in key urban centres but also in Tier-2 cities. Besides, leveraging IoT, sensors, and automation underscores the company's commitment to operational excellence, energy efficiency, and fortified security measures. This unique blend of localised expertise and expansive global reach positions STT GDC India at the forefront of the evolving data centre technology landscape.

ADDRESSING ENTERPRISE NEEDS

STT GDC India actively responds to evolving enterprise needs, spearheading digital transformation while

> The company has invested in liquid cooling for servers and is exploring innovations like gas, dual fuel generators, and heat recovery solutions.

> Rigorous testing, predictive maintenance, and real-time monitoring enable proactive identification and swift resolution of potential issues.



IN BRIEF

- STT GDC India is leading the way on AI and HPC innovation front ,the company's DCs are ready to host high performance computing AI/ML (HPC) infrastructure.
- The company's edge computing strategy spans key urban and Tier-2 cities, emphasizing IoT, sensors, and automation for operational excellence.
- With a 30% revenue market share, it actively contributes to India's digital ecosystem while focusing on sustainability and responsible innovation.
- Leveraging global insights, the company innovates in design and construction, maintaining a safety-first culture and achieving ISO 45001 certification.
- It prioritizes reliability and resilience through redundant systems and robust infrastructure to ensure up to 100% uptime.
- Committed to environmental sustainability, it is investing in energy-efficient solutions pledging net carbon neutrality by 2030.

alleviating IT and business pain points. With a substantial 30% revenue market share and strategic investments in 300MW IT power load, the company is contributing significantly to India's digital ecosystem.

The unwavering commitment to sustainability, exemplified through AI factories, reflects a future focus on responsible innovation. Collaborations with state governments and the establishment of a Bangalore Centre of Excellence also underscore the company's dedication to upskilling professionals. As India's digital growth unfolds, the company persists in expanding core and edge capacities, ensuring a conscientious and sustainable approach to meet evolving enterprise demands.

DELIVERING INNOVATION AND SAFETY

Leveraging global knowledge as well as insights from the local market, STT GDC India has been innovating on multiple fronts. The company's technology advancements in design and build, featuring tools like BIM LOD 400/500 models, enable faster, error-free facility construction. A replicable integrated programme management ensures on-time project delivery, recognised as a best practice.

The unwavering safety-first culture of the company, certified by ISO 45001, has resulted in zero serious injuries. With over 19 years of expertise, operations excellence and sustainability initiatives, including large-scale PPAs and pioneering technologies like Liquid Immersion and DLC Cooling, demonstrate the company's commitment to a carbon-neutral world by 2030.

ENSURING RELIABILITY AND AVAILABILITY OF SERVICES

At STT GDC India, reliability and availability are the cornerstones of the data centre services. The company ensure uninterrupted operations and up to 100% uptime through redundant systems, robust infrastructure, and stringent maintenance schedules. Its facilities boast multiple layers of backup power, diverse network connectivity, and high-tier cooling systems, minimising downtime risks.

Rigorous testing, predictive maintenance, and real-time monitoring enable proactive identification and swift resolution of potential issues. Additionally, highly skilled

> With a 30% revenue market share and strategic investments in 300MW IT power load, the company is contributing significantly to India's digital ecosystem.

and dedicated teams ensure round-the-clock support and response to maintain service availability at all times. These measures collectively guarantee the reliability and resilience of data centre services to meet the critical needs of customers.

DRIVING SUSTAINABLE PRACTICES

STT GDC India remains dedicated to environmental sustainability, employing multiple strategies to reduce its carbon footprint. It is committed to leveraging renewable energy sources, with current levels meeting over a third of its energy needs, while aiming for 65-70% utilisation. The company has also pledged to make its data centre operations net carbon-neutral by 2030

It has also invested in highly efficient liquid cooling for servers to boost energy efficiency and continually explore innovations like gas, dual fuel generators, and heat recovery solutions.

Alongside these efforts, the company's stringent electronic waste management adheres to eco-friendly disposal practices in line with regulations. The company's continuous focus on enhancing Water Usage Efficiency (WUE) and Power Usage Effectiveness (PUE) underscores its commitment to minimising resource consumption while delivering reliable services.

ENABLING DATA SECURITY

The company has a robust multi-layered 24x7 security framework that safeguards its data centres from the perimeter to customer cages via physical and logical controls, surveillance systems, and cybersecurity policies at STT. Also, world-class health and safety policies generate a security-first culture that prioritises customer satisfaction.

To ensure resilience, the company employs infrastructure redundancies such as backup power, optimised cooling, and rigorous maintenance. To future-proof the ability to supply highly reliable and available services the company continuously monitors crucial systems through IoT sensors across the data centre facilities.

CHALLENGES AND SOLUTIONS

In the dynamic data centre sector, managing and operating centres presents issues such as growing construction costs, prolonged delivery lead times (3-6 months), and increased competition. The inflow of new companies dilutes the sector, turning it into a real estate-centric business. The company, however, has been able to overcome these obstacles by emphasising on reliability, SLA and uptime track record, safety standards, compliance, ethics, security, and the financial stability of the service provider.

To address difficulties collectively, the company participates in collaborative efforts with industry bodies like CII, IGBC and ASSOCHAM, as well as MeitY and other government organisations. In a nutshell, the company employs experience, capabilities, and resources to handle these inherent challenges, delivering smooth support for customers on their digital journey.

STT GDC India has a robust expansion plan that entails doubling the national data centre capacity every 4-5 years to keep pace with the rising demands in India. The company currently operates 28 facilities amounting to over 300MW IT Load capacity across 10 cities, with large new greenfield campuses underway in Mumbai, Chennai and Kolkata.

Over the next 3-5 years, STT GDC India envisions investments exceeding USD 1 billion towards new builds and massive expansions of existing sites. This capacity growth allows the company to cater to edge computing needs while scaling core infrastructure. With long experience supporting digital transformation in India, STT GDC India's sustained investments in state-of-the-art, scalable, and secure facilities reinforce the company as the partner of choice amidst the country's data consumption boom.

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"Quality of patents is more important than timeliness"

As the Head of Patent Development at Ericsson, ***Gabriele Mohsler*** *leads the global efforts in creating and enhancing the company's patent portfolio. While Ericsson has achieved over 60,000 patents, emerging as a company holding one of the strongest radio communication patent portfolios in the industry covering 3G, 4G and 5G cellular standards, Mohsler has also been driving the initiative of prioritizing quality over quantity. In an interaction with* ***Shubhendu Parth,*** *she shared insights into the framework and key pointers defining patent quality. She also talked about Ericsson's R&D philosophy and investments in India, the role of startups and MSMEs in driving technological innovation, and the IPR ecosystem in India. Excerpts:*

There has been a shift in India's technological landscape over the past decade, from a focus on software patents to an increased emphasis on engineering and hardware products. How do you reflect on this change?

I think software is important, especially in the patent field. Most of the inventions at Ericsson—and we file around 2,000 patents every year—are software-related. It was the same even 10 years back; it had already evolved from hardware-centric innovations to a focus on software.

Overall, the contributions from the country have risen significantly, not just tied to hardware advancements but driven by the growth of software within the nation. During my last visit, just before the onset of the pandemic, and in the preceding years, there has been a consistent increase in these numbers. This growth is directly linked to increased R&D and technology investments in the country.

In terms of R&D investments in India, is it primarily from local companies or global entities like Ericsson?

I believe it is a combination of both. At Ericsson, we are committed to R&D in India, with 1,800 people actively contributing to research and development. The reason behind this commitment is the presence of excellent engineers and professionals in India who drive and develop technology and products. In that sense, it is not entirely independent, as our investment in India is a testament to the trust we have in the country. Although we are an international company headquartered in Sweden, the decision to invest in R&D in India is rooted in the excellence of engineers and R&D professionals here.

Given India's rise as the 3rd largest ecosystem for startups globally, how do you perceive the role of startups and MSMEs in driving technological innovation, especially in the telecom sector?

I think startups need to invest in the technology and build use cases. While their R&D departments may not be as extensive as larger corporations, startups need to focus on technology. If they generate innovative ideas and technologies, disregarding intellectual property rights (IPR) momentarily, they can develop compelling use cases that will gain traction in the market. Having both engineering and entrepreneurial perspectives is vital in driving this innovation and discovering new, creative ideas. Subsequently, these ideas can evolve into tangible products for the market.

Is there a process through which Ericsson engages with these new entities, particularly MSMEs involved in R&D within the telecom sector?

We do not engage with startups as such. Our focus is on conducting our R&D here in the country, specifically in the development and deployment of our 5G products in the market. We, however, work with academia; for instance, we have signed an MOU with IIT-Chennai for Responsible AI. These collaborations, where our R&D centres are actively involved, form the foundation of our engagement strategy.

Are there any plans in response to the Government of India's announcement on Innovation Labs?

Internally, we are actively exploring this, but currently, there is nothing specific to share. We are aware of the announcement and are carefully considering it. Perhaps, by later next year, we will have more information to disclose.

Ericsson recently signed the EPO patent quality charter. What does it mean for the company and

how will it translate into benefits for the India R&D centre?

Thank you for the question because it was my initiative. We began with the fundamental belief that our focus should be on quality, not quantity. To elaborate, we scrutinised our patent portfolio, acknowledging our substantial 60,000 patents and an annual filing rate of 1,800 to 2,000. We recognised the value of this portfolio but insisted on maintaining a commitment to quality, recognising that quantity alone is insufficient.

Regarding the EPO Quality Charter, Ericsson is one of its founding partners. This initiative established an industry-wide commitment to quality patents, emphasising a dedication beyond mere numerical filings. Our self-commitment extends to encouraging the patent office to actively engage in discussions with us, striving collectively for better patents. For us, the quality of patents is more important than timeliness; it is enforceable patents that are really good. We want to build an understanding of this.

So, how does it apply to India? Our discussions with the patent office align with the existing IP Five offices (IP5), representing the global patent offices. We anticipate the emergence of IP Six with the Indian patent office; indicative of the serious consideration India receives from international patent offices. We aspire to contribute to the harmonisation and elevation of quality standards globally. This is a dialogue we intend to have with the patent office here, and I can confidently say that in India, our perspective is heard.

And how does the adoption of the EPO Quality Charter work in collaboration with the patent office?

The initiative is industry-driven, purely nonprofit, and self-motivated. We, as industry representatives, typically Chief Intellectual Property Officers (CIPOs) or lead counsels in companies, engage with the patent offices to explain what quality means for us and them. While our primary focus has been on the EPO due to identified needs, we are open to similar discussions with any patent office globally.

Can you elaborate on the framework and key pointers that define the quality of patents?

Key pointers for us include well-searched cases with clarity, ensuring an unambiguous definition of claims and scope. We emphasise the importance of clarity as the patent office's current approach sometimes lacks enforceability due to unclear language. Additionally, we advocate for thorough searches to prevent unexpected prior art challenges, which can be costly for startups investing in patents. Our emphasis is on complete prosecution, including examination, before granting.

We are not there to say you need to grant us a patent. We are there to ask for quality patents. Companies that are looking to achieve high numbers of patents are not part of this quality charter; Ericson also has high numbers and is part of the top 10, but we are not aiming for a volume game. Our quality demand contrasts with the current approach where timeliness is considered a measure of quality. The push for faster grants compromises the depth of examination, resulting in lower quality.

Are there specific parameters for evaluating the usefulness of patents?

Usefulness is evaluated based on whether patents read on a product or standard, focusing on enforceability and the novelty of patentability aspects. We do not want to have something in our portfolio that ends up becoming invalid because another publication or patent existed before. Hence, a complete search is essential. I know that the Indian Patent Office made its whole documentation available to the other patent offices to enable them to search. And that is very important. I am responsible for over 60,000 patents at Ericsson and the majority or nearly all of our portfolio is strong and enforceable; any patent found lacking is pruned. We recently conducted a significant pruning to remove patents that were not useful due to existing prior art.

Experts also point out that commercialisation of Standard Essential Patents (SEPs) may be useful for Indian startups in R&D. Can you elaborate on the potential benefits of this approach, especially for startups lacking production capabilities?

Production and patents are detached from each other, and for startups, creating a patent involves engaging in strong R&D. One needs to have good technology and work on it; a patent is always an accompanying product of strong R&D. In the case of Ericsson, the patent is a natural byproduct of our R&D investments to drive elite technology. Commercialisation is not the front end. However, if the technology is good, we commercialise it for a fair return on investment.

Our 5G products and portfolio exemplify this synergy. While commercialisation is important, the primary

> We emphasise the importance of clarity as the patent office's current approach sometimes lacks enforceability due to unclear language.

focus is on developing cutting-edge technology. For startups, having a strong patent, regardless of product presence, allows for licensing opportunities. Even if it later becomes a SEP patent, the focus should always be on technology development.

Can you provide insights into the significance of licensing within the global standardisation ecosystem, particularly in the context of ongoing investments in innovations like 6G, and how this contributes to fostering collaboration?

Currently, we are actively licensing our 5G patents, with ongoing discussions for new agreements. Simultaneously, we are investing in 6G and advancing 5G technologies. The licensing income generated allows us to afford these substantial investments in new R&D and technology for the upcoming years. The entire licensing narrative and standardisation are built on collaboration; it is not about one company driving a standard.

We encourage collaboration and let technology developments unfold organically. We do not push specific technologies from the IPR side; instead, we foster collaboration and later assess if we have patents related to those collaborative efforts. In Ericsson, this approach works seamlessly, with a wealth of patents supporting collaboration, and it extends beyond major competitors to include startups globally. Whether it is a startup from India or elsewhere, if they bring strong technology ideas to the standardisation process, we are open to collaboration. The essence is good technology fostering collaboration, and if such a company holds a patent, it enhances the collaboration further.

And what are the key technologies or areas that Ericsson is currently working on in terms of patents?

The process is driven by the technology Ericsson develops, and patents follow suit. For example, our CTO decides to involve AI, and then we work on patents related to AI. It is not a case of deciding to have patents in AI and then developing AI. Good patents follow good technology. Our primary focus areas include radio technology, telecommunications, and newer areas like AR and VR. The company's technology councils drive decisions, and we align our patenting efforts with the company's technology focus. It is a natural progression where technology comes first, and patents support and protect that technology.

Is Ericsson involved in any work related to Industry 4.0?

In Germany, we have a campus actively engaging with industries to create connected ecosystems. This involves dedicated networks, and we have a showcase in collaboration with the University of Aachen. We provide products to companies looking to connect their robots and sensors. Our involvement extends to working with Fraunhofer, and we are actively exploring industrial deployment, especially in the area of dedicated networks. The company is currently assessing business opportunities in this domain, and our dedicated networks allow companies to create connectivity for their factories.

As the driver of the patent initiative at Ericsson globally, how do you compare India's IPR regime with the rest of the world?

India's IPR regime has taken significant strides forward. In the past, we faced lengthy delays in case examinations, leading to uncertainty. However, the current scenario sees fast grants with good quality. There is an effort to harmonise results across different locations like Chennai and Delhi.

The Patent Office, through the hiring of numerous examiners, has expedited processes, and while the speed is impressive, it does not compromise the quality of decisions. We observe a keen interest among examiners in the field, contributing to good technology development. The strides made reflect a positive evolution in India's IPR landscape.

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[POINT OF VIEW]

ENHANCING DATA CENTRE MANAGEMENT FOR BETTER SERVICE ASSURANCE

Data analytics, AI, and ML play crucial roles in optimising data centre performance and efficiency. Here's how these technologies contribute

BY GIRISH DHAVALE, CTO, DATA CENTRE SERVICES, SIFY TECHNOLOGIES LTD.

Data centres have emerged as a crucial component of the IT infrastructure of businesses. They handle vast amounts of data generated by various sources, and over the years have transformed into massive and complex entities. Of late, data analytics has emerged as a necessary ally for data centre service providers, powered by the growing need to improve parameters like operational efficiency, performance, and sustainability. In this blog, we will discuss the different ways in which data analytics and AI/ML can help enhance data centre management and empower data centre service providers to deliver better service assurance to end customers.

How data analytics and AI/ML can help service providers in data centre optimisation

Today, data centre service providers are leveraging data analytics in various ways to optimise data centre operations, reduce costs, enhance performance, reliability and sustainability, and improve service quality for customers. They employ a variety of methods to collect data from colocation, on-premise and edge data centres, which include physical RFID/EFC sensors, server, network and storage monitoring tools, security information and event management (SIEM) systems, configuration management databases (CMDBs), API integration, and customer usage data. The data collected

is then fed into a centralised monitoring and analytics platform, which uses visualisation tools, dashboards, and alert systems to analyse the data and generate insights.

Furthermore, by integrating IoT and AI/ML into data centre operations, service providers are gaining deeper insights, automating various processes, and making faster business decisions. One of the most critical requirements today is for analytical tools that can help with predictive assessment and accurate decision-making for desired outcomes. This is achieved by diving deep into factors such as equipment performance, load demand curve, and overall system performance, as well as intelligent risk assessment and business continuity planning. Selection of the right tools, firmware, and application layer plays a major role in making such an AI/ML platform successful.

The relationship between analytics and automation from the perspective of data centres is rather symbiotic. Data centres are already automating routine tasks such as data cleaning, data transformation, and data integration, helping data centre service providers free up resources for more strategic analytics work, such as predictive modelling, forecasting, and scenario planning. In turn, data analytics provides valuable insights that enable data centres to implement intelligent automation and optimisation techniques. This may include workload balancing, dynamic resource allocation, and automated incident response.

Here are some of the key areas where data analytics and automation have a significant impact:

- **Enhancing operational reliability:** Data analytics, AI/ML and automation can enable data centres to ensure optimal performance. This involves using predictive maintenance, studying equipment lifecycles for maintenance, and incident history analysis to learn from past experiences. In addition, AI/ML-driven vendor performance evaluation and SLA management incorporating MTTR and MTBF further strengthen operations. Leveraging these metrics within the ITIL framework helps data centres gain valuable operational insights and maintain the highest levels of uptime.

- **Performance efficiency:** Data centres consume a substantial amount of energy to power and maintain desirable operating conditions. To optimise services, track hotspots, prevent hardware failure, and improve overall performance, modern data centres analyse data points such as power usage, temperature, humidity, and airflow related to servers, storage devices, networking equipment, and cooling systems. Prescriptive analytics can take this a step further by providing recommendations to optimise utilisation and performance.

- **Predictive maintenance:** Predictive analytics is a powerful technology that uses data to forecast future performance, identify and analyse risks and mitigate potential issues. By analysing sensor data and historical trends, data centre service providers can anticipate potential hardware failures and perform maintenance before they escalate, with advanced predictive analytics enabling them to improve equipment uptime by up to 20%.

- **Capacity planning:** Businesses today must be flexible enough to accommodate capacity changes within a matter of hours. Data centre service providers also need to understand current usage metrics to plan for future equipment purchases and cater to on-demand requirements. Data analytics helps in optimising the allocation of resources like storage, compute, and networking while meeting fluctuations in customer needs and improving agility.

- **Security and network optimisation:** Data centres can use analytics to monitor security events and detect vulnerabilities early to enhance their security posture. By analysing network traffic patterns, data analytics tools help identify unusual activities that may indicate a security threat. They can also monitor network performance, identify bottlenecks, and optimise data routing.

- **Customer insights:** Datacentres collect usage data, such as the number of users, peak usage times, and resource consumption, to better understand customer needs and optimise services accordingly. Analytics helps providers gain insights into customer behaviour and needs, enabling them to build targeted solutions that offer better performance and value. For example, through customer-facing report generation, organisations and end-customers can gain valuable insights and optimise their operations. Additionally, analytics accelerates the go-to-market process by providing real-time data visibility, empowering businesses to make informed decisions quickly and stay ahead of the competition.

- **Environment sustainability and energy efficiency:** Data centres have traditionally consumed significant power, with standalone facilities consuming between 10-25 MW per building capacity. However, modern data centre IT parks now boast capacities ranging from 200-400+ MW. This exponential growth has led to adverse environmental impacts, such as increased carbon footprint, depletion of natural resources, and

> AI/ML modelling can help data centres achieve 8-10% saving on PUE below design PUE – helping to balance environmental impact with an efficiency better than what was originally planned.

soil erosion. Using AI/ML, performance indicators like CUE (Carbon Utilisation Effectiveness), WUE (Water Utilisation Effectiveness), and PUE (Power Utilisation Effectiveness) are analysed to assess efficiency and design green strategies, such as adopting renewable energy, implementing zero water discharge plants, achieving carbon neutrality, and using refrigerants with low GHG coefficients. For example, AI/ML modelling can help data centres achieve 8-10% saving on PUE below design PUE – helping to balance environmental impact with an efficiency better than what was originally planned.

- **Asset and vendor performance management:** The foundation of the AI/ML platform lies in the CMDB, which comprises crucial data, including asset information, parent-child relationships, equipment performance records, maintenance history, lifecycle analysis, performance curves, and end-of-life tracking. These assets are often maintained by OEMs or vendors to ensure reliability and uptime. AI/ML aids in developing availability models that factor in SLA and KPI management. It can provide unmatched visibility into equipment corrections, necessary improvements, and vendor performance. It can also help enhance project models for expansion build-outs and greenfield designs, accurately estimating the cost of POD (point of delivery) design, project construction, and delivery.

- **Ordering billing and invoicing:** AI/ML plays a vital role in enhancing the efficiency and effectiveness of order, billing, and invoicing processes. Its impact spans various stages, starting from responding to RFPs to reserving space and power, managing capacity, providing early access to ready-for-service solutions, facilitating customer onboarding, and overseeing the entire customer lifecycle. This includes routine processes such as invoicing, revenue collection, order renewal, customer Right of First Refusal (ROFR) management, and exploring expansion options both within and outside the current facility.

Selecting the right data analytics solution

The implementation of data analytics and automation through AI/ML requires careful consideration as several parameters, such as data quality and level of expertise play a crucial role in delivering efficient end results. To succeed, businesses need to choose user-friendly and intelligent solutions that can integrate well with existing solutions, handle large volumes of data, and evolve as needed.

At Sify – India's pioneering data centre service provider for over 23 years, we continuously innovate, invest in, and integrate new-age technologies like AI/ML in operations to deliver significant and desired outcomes to customers. We are infusing automation led by AI/ML in our state-of-the-art intelligent data centres across India to deliver superior customer experiences, increased efficiency, and informed decision-making, resulting in more self-sustaining and competitive ecosystems. For example, leveraging our AI/ML capabilities has been proven to lead to over 20% improvement in project delivery turnaround time. Our digital data centre infrastructure services offer real-time visibility, measurability, predictability, and service support to ensure that our customers experience zero downtime and reduced Capex/Opex.

How do Sify's AI-enabled data centres impact your business?

- **Person-hour savings:** Automation of customer billing data and escalations resulting in up to 300 person-hour savings in a month.

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- **Compliance adherence:** Meeting global standards and ensuring operational excellence and business continuity.

To know more about our world-class data centres and how they help enterprises achieve positive business outcomes, scan the QR code.

A fresh epoch for the communication sector

The Telecom Act 2023 marks a significant stride in India's telecom sector drawing upon various aspects of similar global regulations

BY JAIDEEP GHOSH

India has achieved a significant milestone with the enactment of the Telecommunications Act of 2023, supplanting the antiquated Indian Telegraph Act of 1885 and archaic regulations. This progressive legislation aims to revolutionise the telecom landscape, attract investments, and pave the way for a dynamic era of digital connectivity. Let us delve into its key features, potential impacts on the industry, areas necessitating clarity, and a comprehensive comparison with analogous regulations in diverse geographies.

IMPACT ON THE INDUSTRY

The Act's streamlined regulatory environment and emphasis on digital infrastructure are poised to attract substantial investments, fostering sectoral growth and employment. While the entry of new full-scale telecom operators seems improbable, fresh investments in satellite

> Similar to the US and EU, India encourages foreign and domestic investments, balancing competition with consumer protection.

INTERNATIONAL PERSPECTIVE

	USA Telecommunications Act 1996	PRC (China) Telecommunications Regulations (2016)	EU Electronic Communications Code 2018	Indian Telecommunications Act 2023
Objective	Deregulation, competition, universal service	Facilitate high growth with State control	Consumer protection, high-speed networks, fair competition	Facilitate investment, spectrum management, consumer rights, dispute resolution mechanism
Key Features	Breakup of Bell System, cable market deregulation, interconnection requirements	Licensing framework, foreign investment restrictions, data security and privacy, content control.	High-speed network access, fair competition, consumer protection, net neutrality	Affordable broadband access, spectrum allocation, consumer protection, cybersecurity, quality of service.
Licensing	Reduced barriers, ownership restrictions loosened	Strict control, foreign investment limitations	Streamlined framework, spectrum licensing	Single authorisation framework, investment encouraged
Interconnectivity	Mandatory for competition	Mandatory, regulated by the Government	Interconnection agreements	Operator responsibility, light regulatory oversight
Regulation	Focuses on market forces and competition to drive innovation.	Strong government oversight, data security emphasis	Harmonised EU-wide framework, blends market principles with consumer protection and public interest goals.	Independent regulator, government control in instances of national security and public safety
Competition	Encouraged through deregulation	Limited by state control, licensing	Fair market rules, market entry facilitation	Fostered through simple authorisation, infrastructure sharing
Consumer Protection	Limited provisions, Universal Service Fund	Emerging focus, some protections	Strong emphasis, transparency, switching rights	Consumer choice, tiered dispute resolution mechanism
Data Security and Privacy	Limited requirements, industry-driven	Government control, strict data localisation	Harmonised EU regulations, GDPR compliance	Portfolio of regulations covering IT, data protection, media and telecom.
Content Control	Limited government control over content, but some provisions for indecency and copyright protection.	Broad government authority, internet censoring and filtering	Balanced approach, illegal content removal	Intermediary liability, content blocking powers under specific circumstances
Network Investment	Private sector driven	State-led and private participation	Private investment, Harmonised spectrum management, investment incentives	Private led Infrastructure development focus, spectrum allocation reforms, infrastructure sharing. Supplemented by government operators and initiatives such as Bharat Net optical fibre backbone.
Challenges	Maintaining balance between competition and public interest, net neutrality concerns and disputes due to political stance, data privacy protection regulation emerging.	Balancing economic development with individual rights and freedoms, ensuring fair competition in a state-controlled market.	Implementing regulations effectively across diverse member states, addressing concerns about net neutrality and data privacy.	Treatment of OTT and convergence services, ensuring effective spectrum management, cyber security and addressing potential regulatory overlaps.

> The Act takes a balanced approach between private sector investments and government control, especially for national security.

services and infrastructure are imminent. Additionally, it paves the way for new entrants in niche segments.

The Act's clarity in various areas, such as spectrum allocation for satellite communication services, is anticipated to expedite decision-making among service providers and ecosystem participants. This could result in accelerated growth within the sector.

Improved connectivity, enhanced service quality, and potentially lower tariffs, particularly in rural areas, are foreseeable outcomes due to streamlined processes and heightened competition. The Digital Bharat Nidhi funds could further innovation and rural coverage.

However, the expanded government powers for surveillance, data access, and biometric verification necessitate robust processes and safeguards to protect individual liberties.

AREAS OF CONCERN

While the Act excludes OTT, concerns persist that its broad definition of telecom services (transmission, emission, or reception of any messages through wire, radio, optical, or other electromagnetic systems) could inadvertently encompass certain communication-focused OTT platforms in specific instances.

Clarity is needed regarding the distinction between the new authorisation framework and the existing licensing system.

The Act is applicable to offences committed outside India if it involves a telecommunication service provided in India or telecommunication equipment or network located in India. There is a need for clarity on how this may be implemented in today's era of cyber threats.

KYC through verifiable biometric based identification could slow the growth of subscriber onboarding and may lead to cyber security issues relating to storage and usage of subscriber biometric information. Besides, this will be difficult to implement for enterprise customers.

Other concerns about potential regulatory multiplicity/ overlaps and overreach, spam control effectiveness, and cybersecurity persist, urging the need for clear guidelines and effective implementation.

INTERNATIONAL COMPARISON

The new Act is contemporary and forward looking. It considers the real issues associated with the rapid growth of the telecom and technology sectors, infrastructural constraints, the converging nature of products and services, and blurring of industry boundaries. The Act draws upon various aspects of similar regulations prevailing globally and incorporates several leading practices.

The Act takes a balanced approach between private sector investments and government control, especially for national security.

Similar to the US and EU, India encourages foreign and domestic investments, balancing competition with consumer protection, while China emphasises stringent state control. In terms of data security and censorship, the EU leads with strong regulations, the USA relies more on industry efforts, China enforces strict control, and India adopts a nuanced approach, reflecting a convergence of diverse global practices.

A broad comparison of the telecommunications regulations in the US, China, the European Union, and Indian Telecommunications Act is provided here (see table International Perspective)

In summary, the Telecommunications Act 2023 marks a significant stride in modernising India's telecom sector. The success of the Telecommunications Act 2023 hinges on effective implementation, clear rules and guidelines, and addressing concerns within the prevailing and forthcoming digital regulatory framework.

The fair execution of this Act is pivotal. The evolution of this new framework and its lasting impact on the industry warrant close observation.

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[COMMENTARY]
POLICY

Telecom Bill 2023: Promise and challenges

The new Bill establishes a policy framework that incentivises innovation and expedites the provision of new-age services in India

BY MANOJ CHUGH & SHYAM SUNDER

The telecom sector has played a significant role in the growth and development of India. It has helped to employ four million people. It serves 117.9 crore subscribers, contributing to 6% of GDP, growing at a CAGR of over 9%.

The current telecom framework is based on three outdated laws dating to the 19th century that badly need an overhaul, given the rapid technological advancements, the advent of next-generation services pivoted on digital, and the fast-changing demands of our citizens. The government's focus on digital public infrastructure requires the underpinning of a modern, robust, and secure telecom infrastructure while leveraging the current momentum in the sector.

The introduction of the Telecom Bill 2023 seizes an opportunity, providing clarity for all stakeholders. The Bill establishes a policy framework that incentivises innovation and expedites the provision of new-age services.

The Bill's focus can be categorised into four main areas. Firstly, modernisation and streamlining have led to the removal of over 100 compliance burdens, updating the legal framework, simplifying licenses and procedures, and fostering competitiveness for a more dynamic regulatory environment.

Secondly, infrastructure development aims to create a conducive environment for expansion, incorporating provisions for streamlining 'Right of Way' acquisition, offering financial incentives for private investment, and implementing measures to optimise spectrum usage and allocation.

Thirdly, national security and public safety provisions empower the government to manage telecom networks during emergencies, authorising lawful interception and surveillance under specific circumstances. It emphasises safeguarding national security and public safety while addressing concerns about potential misuse and privacy violations.

Lastly, consumer protection and balancing interests aim to address user concerns by establishing grievance redressal mechanisms and outlining data privacy

> The benefits of the Indian Telecom Bill 2023 for the Indian economy are significant, but they must be weighed against the potential downsides.

provisions. This approach strives to balance innovation and competition with consumer protection and the safeguarding of user rights.

DRIVING NEW TECHNOLOGY GROWTH

A key aspect of the Bill includes a focus on emerging technologies which acknowledges the evolving nature of the sector and strives to adapt to future advancements and focus on the digital economy. Its focus on future-proofing and adaptability could provide a supportive environment for 6G research and development, paving the way for next-generation technologies that leverage Artificial Intelligence (AI) extensively.

Infrastructure development fueled by the Telecom Bill 2023 could contribute up to 1.5% to India's annual GDP growth by 2025. This translates to a potential gain of Rs 5.6 lakh crore per year. Similarly, expanding access and affordability of digital services through improved connectivity could unlock an additional Rs 3.4 lakh crore in gross value added to the Indian economy by 2025. The telecom sector and related industries could see significant job creation, potentially adding up to four million new jobs in the next few years.

The potential benefits of the Indian Telecom Bill 2023 for the Indian economy are multifaceted. New Age Services catalysed around Satellite Communications could see a major impetus. The Bill acknowledges future technological changes but anticipating the full impact of the evolving nature of telecommunications is not easy. Imbibing established international best practices in areas like privacy and regulation could go a long way in positioning India's Leadership on Regulation.

The process of implementation, the Rules, and potential amendments require active engagement with all major stakeholders, both, large and small, to help ensure seamless implementation. Concerns will have to be addressed as the Rules are framed.

BRIDGING THE DIGITAL DIVIDE

In terms of inclusiveness and affordability, how effectively Digital Bharat Nidhi will bridge the digital divide between rural and urban areas remains to be seen. Underserved communities have to be brought into the mainstream as soon as possible.

Measures for ensuring affordable access to digital services and data plans, particularly in the less-served rural areas, have to be addressed on priority. While offering grievance redressal mechanisms, the Bill might need stronger provisions to effectively protect consumer rights and interests against potential unfair practices.

The "Do Not Disturb" Registry needs to be enforced. India has led Net Mobile Subscriber Additions consistently over the last few years. With the requirement of users to now provide verifiable biometrics-based identification to avail of services, there could be a direct impact on subscriber growth and concerns around Privacy.

Whilst telecommunication services have been well defined and the sourcing of networks and services rightfully limited to trusted sources only, new-age service providers may look for additional support or exclusions from some of the stringent provisions. Potential concerns including those around overzealous centralised control may impact private investment. Clarity on the oversight of OTT platforms in the Bill needs to be provided. Broad surveillance powers raise natural concerns about potential misuse. An independent oversight mechanism, like the one implemented in some developed countries, may help.

The potential benefits of the Indian Telecom Bill 2023 for the Indian economy are significant, but they must be weighed against the potential downsides. Addressing concerns about government overreach, surveillance, privacy, inclusivity, and future-proofing will be crucial to ensure the Bill's effectiveness and maximise its positive impact on the economy.

Ultimately, the Bill's success will depend on its quality, implementation transparency, and ability to address concerns while adapting to the evolving economic and technological landscape.

Chugh is the Chairman of Manoj Chugh Advisory LLP, and Sunder is the Senior Vice President of Public Affairs and Sustainability with Intech Organics.

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TV RAMACHANDRAN

USHERING IN THE ERA OF INDIAN TELECOM RESURGENCE

The new Telecom Act addresses key issues hindering the sector's growth, paving the way for innovation, investments, and better customer services

The Telecommunications Act, 2023 which replaces the 138-year-old Indian Telegraph Act of 1885 and two other Acts, represents a milestone in India's telecom sector. It signifies the elevation of digital communications, addressing key issues that previously hindered sector growth, and propelling it to new heights of performance potential.

CLARITY ON SPECTRUM ASSIGNMENT

One of the primary features of this Act is that it provides open, transparent, and clear guidelines for the assignment of radio frequency spectrum for the first time in nearly 30 years since the opening of the telecom sector. The spectrum, the lifeblood of the sector, has unfortunately been the source of numerous heartaches, disputes, and controversies that have plagued the industry. The Act eliminates all uncertainty while clearly outlining directions for transparency and predictability in the assignment of various types of spectrums for different applications or end uses. It effectively provides clarity on what can and cannot be auctioned.

While the Supreme Court judgment in the 2G spectrum matter was considered a necessary course correction for

> Recognising the need for a comprehensive review, the Act takes a transformative step by evolving the USO Fund into the Digital Bharat Nidhi.

the sector, it has unfortunately led to an unending stream of debates, discussions, and non-reasoned arguments. Despite a Presidential reference to the Supreme Court for clarifications and a clear advisory judgment from the apex court, needless debates have persisted.

This Act now settles matters once and for all by strongly affirming, in line with the Supreme Court judgment, that auction is generally the preferred method of assigning spectrum, except for three exceptional areas requiring administrative assignment for specific reasons. These areas include public interest services, government services, and areas infeasible for auctioning due to techno-economic reasons. In the case of satellite communications, auctioning is infeasible because the same spectrum is used by multiple operators in different orbital slots.

This rule also applies to point-to-point backhaul spectrum and WiFi spectrum, as they logically fall into this category, being reusable by the same as well as different users. Additionally, WiFi falls into the category of public interest services. In all such cases, the Act [sections 4 (4), (5), and 57 (1) and the First Schedule] enumerates 19 applications, sub-areas, and use cases given in Schedule 1, which are to be assigned spectrum through the administrative process.

The decision to assign spectrum administratively for Satcom is a hugely positive one, aligned with international best practices. It will tremendously boost investor confidence, significantly increasing the inflow of both international (FDI) and domestic investment to the sector. Furthermore, it will not only spur the mainstreaming of established Satcom players but also boost the spirits of the entire Satcom industry, including a large number of indigenous space startups. Additionally, regulatory and policy certainty for the assignment of spectrum for various other areas and applications for public utility, such as public Wi-Fi and telecom backhaul for long-distance applications, particularly in rural areas, will be extremely useful in the context of inclusive connectivity for all 6.4 lakh+ villages for Bharat Net.

India has a greater need for satellite-based communication than other developed countries and regions due to vast geographically challenging terrains. However, it has only one-third of its Asian peers' satellite connectivity per capita and only one-twentieth or even lower than that of Europe and the US. The Act, working in tandem with the latest Space Policy, will provide a significant shot-in-the-arm to the Satcom sector, boosting the digital dreams of the country to accelerate socio-economic development in an all-inclusive manner.

CLARITY ON THE TREATMENT OF OTT

The Act introduces a significant reform for the Over-The-Top (OTT) sector, marking the second major area of focus. OTTs, being Internet products, have traditionally fallen under the jurisdiction of the Ministry of Electronics and Information Technology (MeitY). They have been subject to regulatory oversight by MeitY and governed by the IT Act, along with the associated rules and guidelines. Under this regulatory framework, the OTT sector has flourished, witnessing substantial growth, evidenced by the remarkable milestone of 22 billion OTT/App downloads in 2022 – one of the highest globally, attracting attention from various international regimes.

However, in recent years, certain vested interests have sought to create confusion by advocating for the regulation of OTTs similar to telecom services. Both the Telecom Regulatory Authority of India (TRAI) and the Department of Telecommunications (DoT) have consistently emphasised that OTTs and telecom are not comparable. OTTs operate in the application and content layer, while telecom functions in the network layer, enjoying exclusive rights such as interconnection, interference-free spectrum, Right of Way (RoW), unique numbering resources, and the right to establish core and transmission networks. Despite these distinctions, the confusion persisted due to the lack of legislative direction, which the Act now addresses.

The Act unequivocally excludes OTTs from its purview, with no mention of them anywhere, in contrast to the earlier version.

It is noteworthy that concerns regarding the impact of the Telecom Bill on broadcasting have been conclusively addressed in the final Act, which does not encompass

To safeguard existing digital infrastructure, punitive measures are introduced under the new law against acts of theft or vandalism.

IN BRIEF

- The Act brings transparency by providing clear guidelines for radio frequency spectrum assignment, eliminating uncertainties.
- Strategic decisions on satellite communication spectrum assignment, are expected to boost investor confidence and accelerate inclusive connectivity.
- The Act excludes OTT services from telecom regulations, emphasising legislative clarity, stimulating innovation, and ensuring exclusive governance by MeitY.
- There is a shift from hard licensing to a modern system of authorisations to simplify the processes and enhance the ease of doing business.
- The transformation of the USO Fund into Digital Bharat Nidhi aims to support universal service, research, and pilot projects.

broadcasting. This resolution brings significant relief to the broadcasting sector.

LICENSING THROUGH AUTHORISATION

For decades, the spectre of hard licensing has cast a shadow over the sector, hindering it in both direct and indirect ways. The Act commendably addresses this issue by replacing the outdated framework with a modern and facilitating system of Authorisations, akin to systems in many advanced Western regimes. The existing system, which involves approximately one hundred different types of licenses with various constructs like license, registration, permission, and authorisation, is streamlined into a simpler construct for three aspects: providing telecommunication services, operating and expanding telecommunication services, and possessing radio equipment. Notably, OTT and Broadcasting Services are excluded from this list.

Currently, the licensing process involves cumbersome documentation spanning hundreds of pages. In contrast, the process of authorisation will result in a concise and worded document. This represents a significant leap forward in the administration of Indian Telecommunications, promising to enhance the Ease of Doing Business and instil confidence among all stakeholders.

DRIVING DIGITAL BHARAT NIDHI

Established on 1 April 2002, the Universal Service Obligation Fund (USOF) initially aimed to support the provision of telecom services to unconnected and underserved areas. However, as time progressed, it appears that the USOF has become inadequately attuned to modern requirements, resulting in the accumulation of a substantial corpus of unutilised funds. Recognising the need for a comprehensive review, the Act takes a transformative step by evolving the USO Fund into the "Digital Bharat Nidhi" under the control of the Central Government.

The new mandate of Digital Bharat Nidhi encompasses several key objectives. Firstly, it seeks to support universal service by promoting access to and delivery of telecommunication services in underserved

> The Act gives a further impetus to innovation and technology development by legislating the establishment of suitable regulatory sandboxes.

rural, remote, and urban areas. Secondly, it aims to foster research and development of telecommunication services, technologies, and products. Additionally, the fund is empowered to support pilot projects, provide consultancy assistance, and offer advisory support toward the provision of services in the specified areas. Lastly, Digital Bharat Nidhi is tasked with supporting the introduction of telecommunication services, technologies, and products.

This strategic evolution aims to revitalise the fund, ensuring its relevance to contemporary needs and empowering it to play a more dynamic role in driving digital connectivity across diverse regions in the country. The Act gives a further impetus to innovation and technology development by legislating the establishment of suitable regulatory sandboxes.

PROTECTING THE CUSTOMERS

The Act introduces crucial measures to safeguard users or customers. Firstly, the 'Do Not Disturb' or DND register is granted a legal mandate to shield users from unsolicited commercial (spam) messages and calls. Additionally, an online grievance redressal mechanism is established to promptly address user grievances. The Act also designates the fraudulent acquisition of SIMs using someone else's identity proof as punishable under the law.

REFORMS TO STREAMLINE RIGHT OF WAY

The Act addresses long-standing challenges faced by operators in rolling out communication infrastructure, such as towers, optic fibre cables, and other network elements. It provides effective legislative backing to resolve these hindrances. Notably, it mandates time-bound permission for installation on public property. Moreover, it requires a mutual agreement between property owners and those intending to set up telecom networks on private property.

It also facilitates the establishment of common ducts in telecom infrastructure for networks and designates the District Magistrate and/or the District Judge for dispute resolution. To safeguard existing digital infrastructure, punitive measures are introduced under the new law against acts of theft or vandalism. These provisions aim to ensure uninterrupted digital connectivity, and as a consequence, the rollout of network infrastructure is expected to accelerate considerably.

CONTINUED FLOW OF REFORMS

In addition to the extensive reforms in various areas introduced by the new Telecommunications Act, a steady stream of significant reforms continues even after the Act. For instance, the ministry recently brought 37 additional telecom products under the Simplified Certification Scheme (SCS) from 1 January 2024, reducing certification time from eight to two weeks and significantly enhancing the ease of doing business.

This brings the total products under SCS to 49, with various charges for testing or evaluation either reduced or waived, reducing application costs by over 80% and alleviating the compliance burden on operators.

Another recent reform extends the scope of registration for standard-based and secured M2M and IoT ecosystems. This allows various types of business entities, partnership firms, LLPs, institutions, etc., to apply for registration, further improving the ease of doing business and boosting investor confidence.

Indubitably, with the advent of the Telecommunications Act 2023, India is poised to develop increased momentum for moving to Digital Bharat through expeditious installation of digital infrastructure as well as an accelerated development of modern satellite communications as well as innovative internet applications and content. The sector is further enthused by the continued flow of reforms even after the Act.

An upward-spiralling effect on economic growth would inevitably result in accelerating the digital economy to USD 1 trillion and raising the Indian economy to the desired USD 5 trillion level.

The author is Hon. FIET (London) and President of Broadband India Forum.

Views are personal.

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Lt Gen AK Bhatt (Retd.)
Director General, Indian Space Association (ISpA)

"Satcom will not compete but complement terrestrial networks"

"We are always in orbit," says ***Lt Gen AK Bhatt (Retd.),*** *Director General of the Indian Space Association (ISpA), when asked about any downtime during the recent holidays. His modest remark takes on a more significant meaning as he elaborates on the complex flight paths he and his team have been navigating, in collaboration with the government's propellers. In an interaction with* ***Pratima Harigunani,*** *he shares insights on various aspects of space and satellites, such as Satcom's relevance with terrestrial incumbency, the progress and significance of space startups, key policy changes like FDI and spectrum, and global issues like space pollution and on-ground affordability. Excerpts from the interview:*

ISpA has been actively involved in addressing crucial policy issues and advocating for various areas. With significant changes occurring in FDI and Satellite Spectrum, how satisfied are you with the progress being made?

We started almost simultaneously with the initiation of a new space policy by the nation. A major reform was the opening up of the space for private players. Initially, there were 10 policies, and they have now been condensed into three focus areas. This approach is more effective than scattering energy and work across multiple places. The private sector can now explore a wide range of areas, from communication to space debris to remote sensing. These are positive indicators of progress. FDI is also crucial as this sector involves substantial investments. With FDI, there will be a greater inflow of resources, and the government is effectively working on earmarking areas for direct approval and those requiring specific permissions. Direct approval would significantly facilitate many projects.

We are pleased that the Satcom spectrum has been considered for allocation administratively. The Telecom Bill has been a blessing. I consider it the government's most forward-looking decision. This aligns with the global method of allocation, and our task now is to determine how to charge various players. India could align itself with international standards, promote global cooperation, drive innovation, create opportunities for startups, and strengthen the country's position in the global satellite market.

Is Satcom going to be better than terrestrial networks unequivocally? What about its inherent issues such as latency, interference, congestion, high power consumption, and orbital positioning?

Orbital positioning presents a challenge with GEO, but various constellations can be strategically placed at different planes and heights, mitigating this challenge. A significant advantage of Satcom over terrestrial networks is the ability to utilise spectrum for multiple users, unlike existing networks where a frequency band is limited to one user. Positioning angles can be diverse, contributing to the reduction of interference and congestion issues. Regarding costs, indeed, Satcom can be more expensive than terrestrial networks, especially when factoring in expenses for launching vehicles and deploying satellites. However, it offsets this by reaching remote areas untouched by current digital connectivity. We expect that the cost dynamics will change with the increase in volume. As of now, Satcom is costlier than terrestrial networks.

What about latency and power usage?

In the case of GEO, latency used to be a significant gap. However, as we move to lower orbits, latency improves significantly. While it may not compete with the levels of 5G, it has reached a point where the user experience is good. With a large number of satellites being launched, power issues are expected to be addressed as well. In short, Satcom is not intended to replace terrestrial networks but rather to complement them.

Can you elaborate?

Satcom adds value by reaching underserved and unserved areas where terrestrial networks face limitations. In areas where terrestrial networks are available, Satcom can function as a backhaul and enhancer of user experience.

> India is making great progress through innovations such as satellites with de-orbiting capabilities and improved methods for refuelling satellites.

It does not replace existing technology; instead, it serves as a complement. While the future remains uncertain, for now, Satcom can prove beneficial in reaching places where fibre connectivity is challenging due to geographies and models. Today, broadband Internet is a necessity, not a luxury, and with Satcom's integration, sectors like IoT, agritech, insurance, and healthcare can experience significant advancements.

Is that aligned with what the recent ISpA-Deloitte-Nasscom report also touched upon; the role of start-ups in the downstream part of spacetech? How soon do you anticipate seeing a Space unicorn emerge?

When you see the global space economy, there is a huge potential for growth in applications, with launch vehicles accounting for only 7-8% of the total global space economy. Start-ups in the space sector, particularly those focused on deep-tech applications, represent a niche area. Currently, our start-ups are targeting promising segments, and within the next one or two years, we anticipate significant progress. Many of these start-ups have the potential to evolve into Unicorns. With the supportive environment from the government, once the first one emerges, it is likely to propel the entire industry forward. We are very confident of India's strengths, particularly in terms of the intellectual prowess and engineering culture showcased in the IT sector's success story.

India has an edge in reusable launch vehicles and low costs. Can we sustain that, especially when Elon Musk's Falcon 9 shows a similar global focus?

With the adoption of reusable rockets, the cost of launching a rocket and placing a satellite in orbit has significantly decreased. The progress is gradual but promising. India has the 'numbers' game in its favour when it comes to the cost-play. Additionally, there is notable progress in satellite miniaturisation, with transponders and satellite equipment becoming smaller; it is a trend observed globally.

How important does self-reliance (indigenisation) become here?

As far as the space sector is concerned, India has been fortunate. The country's space program has a six-decade history, and it stands among the few spacefaring nations globally. Even when facing constraints due to global pressures, ISRO effectively developed independent strengths, such as cryogenic engines and capabilities for exploration of the Moon and Mars.

ISpA has signed several MOUs with organisations like CAPS, AGI, DRDO, and the French Aerospace Industries Association GIFAS. Can you share any insight into that?

ISpA is a premier industry association of space companies launched and we are actively involved in policy advocacy and engagement with all stakeholders in India's space domain. This includes collaboration with the government and its agencies to enhance India's self-reliance, technological advancement, and global leadership in space. Our mission revolves around the entire space ecosystem of India; we want to do everything and anything possible to create, add and enhance it.

We aspire for India to provide services not only for the nation but also for the global market. The space sector is very good at collaboration, both within India and with global entities. For instance, ISRO has established a robust supplier ecosystem, and new ventures are tapping into this indigenous network.

Are we effectively addressing the issue of pollution in Space, especially while dealing with satellite debris?

Space Pollution is a critical focus area, and India is diligently addressing it. From ISRO to other mechanisms, India is following global norms, demonstrating a stringent and careful approach. We are making great progress through innovations such as satellites with de-orbiting capabilities and improved methods for refuelling satellites. A satellite does not become useless because it gets old or gets rust. Rather, it is because the fuel gives away. We are getting closer to achieving fast refuelling and repairing capabilities.

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Stepping up the m-commerce game

With over 1.5 lakh merchants and 5 million transactions in Bengaluru alone, ONDC is transforming mobile-driven e-commerce in India

BY VERNIKA AWAL

In January last year, Open Network for Digital Commerce (ONDC), the Centre-backed initiative to create a Unified Payments Interface (UPI)-like protocol for decentralised e-commerce in India, was opened for public operations in Bengaluru. At the time, the framework was witnessing a fairly light transaction load of around 1,000 transactions every month. These transactions were largely around grocery deliveries in small-ticket transactions.

As 2023 drew to an end, ONDC transactions surged to hit the 5-million-mark monthly transactions in Bengaluru itself, where its first phase of deployment is playing out. ONDC, in its own right, had diversified and evolved from facilitating grocery deliveries to food, and most importantly, mobility.

This evolution showcases the power of ONDC—the next-generation e-commerce democratisation effort by India that can create a first-of-its-kind framework for all of the world. In turn, it showcases what it may mean for mobile-driven e-commerce in one of the world's largest markets, and just like UPI, ends up drawing global interest in its model being replicated as a digital public infrastructure (DPI) around the world.

WHAT IS ONDC?

As explained by its Managing Director and Chief

"ONDC is not an app or a private, walled entity. It operates as a protocol that brings together a network of merchants, service providers, and users."

Thampy Koshy
Managing Director and Chief Executive Officer, ONDC

IN BRIEF

- ONDC, a protocol connecting merchants and users, is poised to democratise mobile-driven e-commerce operations across India.
- Google and Meta's recent partnerships signify ONDC's potential, integrating services like metro ticket bookings and e-commerce access through WhatsApp.
- Crossing five million monthly transactions in December 2023, ONDC aims for 1.2 billion monthly transactions by 2027.
- While ONDC currently operates without fees, a nominal charge is anticipated for technical maintenance as it scales.
- Its non-intermediary status reduces operating technology infrastructure costs.

Executive Officer, Thampy Koshy, in a recent media conference in Delhi, ONDC is not an app or a private, walled entity. Instead, it operates as a protocol that brings together a network of merchants, service providers, and users. In simpler terms, ONDC functions as an intermediary network connecting two entirely separate private companies.

Hypothetically speaking, ONDC could one day enable individuals to choose a local grocery store and have their required items delivered to their homes through a logistics operator of their choice. For transportation needs, users could directly connect with a cab driver and book their services for a specified fee. This concept is akin to Uber but without the regulated, walled garden of pricing that Uber employs. Unlike Uber, booking a cab through ONDC would also mean avoiding the platform fee typically bundled into Uber's pricing. Consequently, this could result in more direct business for the cab driver and more affordable services for users.

In both examples mentioned above, ONDC serves as a facilitating protocol, that helps users in finding the right connections they need. No wonder then, ONDC is being positioned as a service capable of democratising all mobile-driven e-commerce operations across the country. The protocol is inherently mobile-first, with its services accessible through popular platforms such as Paytm and PhonePe, among others.

WHERE DOES IT STAND?

As indicated by Koshy, ONDC has crossed five million monthly transactions as of December 2023. Separate reports have stated that ONDC projects itself to cross 1.2 billion monthly transactions by 2027, less than four years from now.

It is already making strides in this regard. In May last year, PhonePe stated that it was ready to expand the operational areas of its ONDC app beyond Bengaluru. On 19 December, Google announced at an event in

> The ONDC protocol is inherently mobile-first, with its services accessible through popular platforms such as Paytm and PhonePe, among others.

New Delhi that it has partnered with ONDC to onboard metro railway ticket bookings through the Google Maps platform itself. On the very same day, Meta announced at a separate press conference that it is onboarding ONDC to offer e-commerce access for small businesses through WhatsApp.

As services and merchants expand, ONDC stands at the cusp of bringing democratised, open e-commerce to mobile users across the country. With over a billion users projected to be online on mobile phones in India soon, this marks a massive opportunity for ONDC to create a model that could pose a significant challenge to private e-commerce monopolies such as Amazon and even the homegrown Flipkart.

DOES IT CHARGE ANY COMMISSION?

As of now, ONDC does not charge any fee. However, Koshy has said in media interactions before that once the protocol begins to scale, the entity may start charging a "small fee" that remains unspecified as of now. This fee, however, is expected to remain nominal, and would only be to the extent of technical maintenance of the protocol.

ONDC, to be sure, would not hold any data as an intermediary—and would therefore need less operating technology infrastructure expenditure than any other private e-commerce venture.

The big question, however, is that if it takes business away from platforms, why are they interested?

The secret lies in the sheer potential of scale that ONDC can reach out to. If it does scale successfully, ONDC will do away with restrictions of a platform, and make it possible for anyone to order from any platform. While this does take away platform exclusivity, it also brings a platform up to be able to access the user base of a rival platform.

What this does is essentially open up access to over a billion users of mobile phones to practically anyone, which is the true lure of ONDC. Once a user does access a platform, the latter may offer further additional value purchases—now subject to Dark Patterns regulations in India—to generate additional revenue. User recollection of brands that fare well on the ONDC protocol would also gain from reliable services and reputation.

The key here is the access to pretty much all of India that ONDC can enable, which is what is bringing an increasing number of parties into play. For instance, taking the 19 December announcement into account—for Google, the discoverability of a cab from within the Google Maps interface itself means that users will not need to leave Maps to book cabs. In turn, this increases usage time on Maps itself, and along with that, its monetisation may receive a boost through native ads running on it.

Similarly, WhatsApp is one of Meta's biggest challenges when it comes to monetising over 400 million monthly active users on it. With such a massive user base, roping in small businesses to onboard through ONDC will give them the impetus to eventually monetise them, thus expanding the ambit of accessibility of a particular service.

HOW DOES IT DEMOCRATISE M-COMMERCE?

It is this open accessibility that does away with the need for a particular service, thereby not needing exclusive platforms that are not open markets, that gives birth to the idea of ONDC democratising mobile-driven e-commerce operations everywhere in the country. Koshy's target of over a billion monthly transactions via ONDC by 2027 also lends credibility that ONDC's targets are, in fact, quite achievable.

At the heart of it lies the proliferation of smartphones and mobile data to over a billion users cumulatively, which is expected to open up access to e-commerce for any platform, anywhere in the country. With a decentralised web of service providers reaching users—and vice versa too, ONDC is well poised to become the next large-scale successfully developed DPIs—thus bringing in mobile phone-based e-commerce for all.

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Cloud for gaming: Buff or nerf?

Adam Smith
Senior Sales Manager – Games,
Amazon Web Services

> As more and more immersive experiences come in media and entertainment, and linear TV areas, Cloud will become all the more beautiful.

BY PRATIMA HARIGUNANI

Meeting Adam Smith, Senior Sales Manager – Games at Amazon Web Services in one of the many corridors at a huge conference like AWS Re:Invent is like finding an easter egg. It is both fun and surprising to grab a few minutes to chat with him as he gives a preview on how weapons like Cloud, latency, 5G, Silicon and proximity are helping the gaming segment to level up like never before. Will it be GGWP (Good Game, Well Played) for AWS? Let us hunt it out.

What is the significance of the gaming industry for AWS, especially Cloud gaming?

We provide tools enabling game developers, whether small indie creators or major players, to elevate their games. AWS offers a range of tools and technologies for Cloud gaming developers to create exceptional experiences, bringing solutions and practices to differentiate these entities.

AWS has recently collaborated with Immutable. Anything you can share on that?

Our collaboration with Immutable aims to ensure that all developers have comprehensive infrastructure support, whether they are involved in standard games or Web 3. Immutable helps us fill that part in Web 3 space. Immutable plays a crucial role in the Web 3 space,

> AWS offers tools and technologies for Cloud gaming developers to create exceptional experiences, offering solutions to differentiate these entities.

where we will continue to develop the technology that customer asks for. We will continue to bring the best compute, storage and networking out there.

How are gaming enterprises different from traditional enterprises?

Interestingly, in recent years, traditional enterprises have embraced a lot of gaming technology. For instance, Emirates uses it for training, and media and entertainment clients apply it in various business areas. Many cloud-based VFX workloads tap the advantage of low latency and game-engine technology too.

How much is 5G changing this space? Are adjacency, proximity, and availability zones more critical in gaming now, given the need for negligible latency?

Wavelength and Local zones are designed to bring compute capacity to markets around the world. Today, players can connect to anyone with the power of 5G. We bring that experience close to players demanding high levels of connectedness.

Will latency become a competitive differentiator or a staple in gaming as we move into a post-5G world? Any thoughts on India here?

There are games that players play from the East Coast to the West Coast. We can help gaming companies introduce a new region without any issues with servers across either coast. Overall, we are seeing workloads that were set in on-premise environments being moved to the Cloud. Latency can bring near-time responsiveness. It starts in the early part of a game developer's lifecycle. Story-telling is now open to everyone irrespective of geographic boundaries.

Many OTT players are considering a move to gaming. How will the availability or latency angle play out for them?

Well, Riot is doing the opposite and it has been a great partner. We love working with them and supporting their strategy. Netflix is also one of our customers. We are happy to be a part of what they are building. As more and more immersive experiences come in media and entertainment, and linear TV areas, Cloud will become all the more beautiful. It can allow one player to work with similar resources as another one.

About latency, it is not the only factor that is important. Performance is also important. AWS has been working for the last five years on chips to boost it. This year it was Graviton4, which Epic Games has tested and called the fastest chip ever tested. Graviton is powering a new direction. Game developers can find new ways to surprise and delight with boundary-pushing technologies.

Would custom-silicon give a pivot to the gaming industry which has been so reliant on GPUs so far?

Gaming has been using GPUs in a variety of areas. The performance that we bring with Trainium and Inferentia is a good advantage as it also achieves lower costs. That allows game developers to choose the right instance for their application and gives them a wide choice. We also work with Nvidia on GPU offerings.

Do availability zones affect customer choice?

We have 102 availability zones which is a strong factor in how we approach gaming architecture and space. Our local zones and regions are strong differentiators.

Who are your favourite customers?

Riot, known for its League of Legends has been a long-time customer. It will exit its final data centre as part of a multi-year transition in 2024. Then there is Epic Games and more. All game developers are building experiences with us without having to worry about scaling to millions and billions of players.

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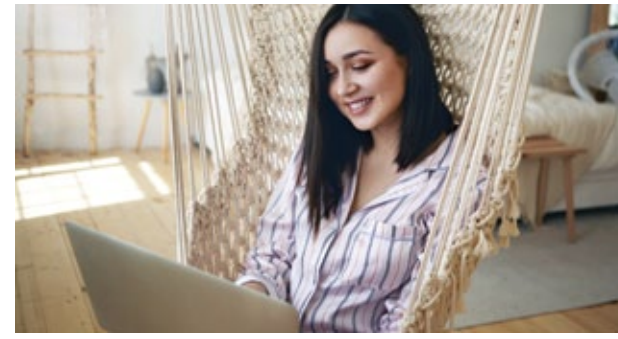
India leads the world in flexible, remote work model

In a global landscape where companies are encouraging a return to the office, ADP's People at Work 2023 report unveils a distinct trend in India, showcasing the growing significance of data, connectivity, and remote infrastructure. The report reveals that 44% of Indian employees are actively engaged in a fully flexible work model, surpassing other APAC countries such as China (16%), Australia (20%), and Singapore (24%).

The study, based on responses from over 32,000 workers across 17 countries, indicates that 74% of surveyed Indian employees reported increased productivity, attributing their success to the acceptance of remote work in office settings. Notably, only 14% of Indians reported working from the office every day, with 41% adopting a hybrid model that includes a certain number of days in the office each week.

The report underscores the flexibility enjoyed by Indian workers, with 43% having organisational approval to work from anywhere globally and 42% having the flexibility to work from anywhere within India. Furthermore, 74% of respondents reported a boost in productivity due to the remote work model.

A significant revelation from the report is that 76% of surveyed women, including 78% of working mothers, feel empowered by flexible working arrangements. This empowerment serves as a key factor in retaining women in the workforce, enabling a balance between professional and personal lives.



Rahul Goyal, Managing Director, ADP India and Southeast Asia emphasised India's standout position in offering the highest workplace flexibility in APAC. Goyal stressed the importance for organisations to adopt a tailored workplace strategy that accommodates the diverse needs of the workforce, fostering a dynamic and progressive work environment.

The report also provides insights into worker expectations for the next 3-5 years. While 35% anticipate continued remote work, 31% foresee a shift to a hybrid model. Additionally, 29% expect closer monitoring of work outcomes, and 39% anticipate full flexibility of hours based on productivity and results metrics. Intriguingly, 25% of workers foresee a reduction in manual tasks due to AI. The findings underscore India's leadership in shaping the future of work through evolving work models and embracing technological advancements.

XgenPlus introduces multi-lingual mail address feature

Data Group's XgenPlus, an email management solutions provider, has introduced a multi-lingual mail address feature that allows users to create email addresses in their preferred language. The initiative focuses on Hindi Mail Address features and emphasises universal acceptance readiness.

The Internationalized Domain Name (IDN) compliance enables DataMail users to use local language characters, going beyond traditional English characters. This development caters to various scripts, including Hindi, Gujarati, Cyrillic, Chinese, and more.

XgenPlus aims to narrow the communication gap between English and non-English-speaking populations by facilitating email communication in native languages. Datamail, with its Multi-lingual Mail Address Feature, aims to garner acceptance across multiple countries,

promoting the use of regional languages. This initiative is a move towards breaking down language barriers and fostering more inclusive and accessible email communication for a broader audience.

Alstom launches digital experience centre for signalling solutions

Mobility solutions provider, Alstom, launched India's first Digital Experience Centre, spanning 5,000 sq. ft. in Bangalore. The hub will serve as a crucial space for executing rail projects and integrating cybersecurity, security, telecom, and SCADA features. The company now has its largest signalling lab infrastructure, spread across 60,000 sq. ft. in India.

The centre will facilitate learning, experimentation, and validation of Alstom's signalling solutions, conducting simulations of world-class technologies. It leverages the Internet of Things, Internet of Behaviours, GenAI applications, and blockchain for railway innovation projects, enhancing business capabilities, and efficiency, fostering a culture of innovation.

With features like centralised demonstration, remote monitoring, safety-critical hardware display, and end-to-end tests, the centre aligns with the 'Make in India' initiative and incorporates emerging technologies like AI, Big Data, intelligent maintenance, LTE, and cybersecurity, further positioning Alstom in sustainable mobility solutions.

Olivier Loison, Managing Director, Alstom India, emphasised the centre's role in driving safety, efficiency, and improved passenger experience in India's modernised and complex rail network. Alstom aims to lead rail technology innovation by harnessing the country's talent pool.

The Digital Experience Centre supports over 7 million hours of engineering work for both Indian and global projects. According to a study by GII, the market for railway signalling systems is expected to grow significantly, and Alstom's infrastructure in India addresses over 40% of its worldwide R&D needs.

Honeywell bags RLS contract for integrated building management

Honeywell Automation India has announced that its Honeywell Building Solutions business has secured a contract from Reliance Life Sciences (RLS) for building management and safety technology. The contract involves supply, installation, testing, and commissioning of integrated building management command and control and environment monitoring systems.

It also includes the integration of current fire detection and voice evacuation systems with Honeywell Connected Life Safety Services (CLSS) for its multiple plants in Nashik. Honeywell's contract with RLS encompasses a seven-year annual maintenance support commitment, providing sustained operational excellence. The seven-year contract includes an annual maintenance support commitment.

Honeywell's Enterprise Buildings Integrator (EBI) Command and Control Suite empowers Reliance Life Sciences with a comprehensive overview of its building management and security systems that is seamlessly consolidated within a unified dashboard. This integration allows Reliance Life Sciences to oversee numerous operations and stations across a 160-acre facility more efficiently.

The CLSS cloud platform integrates data for secure, compliant, and efficient fire system management, offering connectivity, intelligence, and remote monitoring. As part of the project, the company will integrate and deploy its EBI Command Control Suite and CLSS making it a significant win in the pharmaceutical vertical. "The building management and safety technology will enhance the overall safety, efficiency and sustainability across RLS," said Ashish Modi, President, Honeywell India.

RLS has a long-standing relationship with Honeywell in building management technology solutions. Expressing satisfaction about the partnership with Honeywell, RLS President KV Subramaniam highlighted the transition to next-generation connected life-safety services on a larger scale across multiple manufacturing facilities in Nashik.

Airtel Business, IntelliSmart to power 20 million smart meters

Telecom service provider Bharti Airtel has formed a strategic partnership with IntelliSmart Infrastructure to deploy over 20 million smart meters in India. This marks Airtel's foray into smart metering applications such as Head End Systems, Meter Data Management Systems, along with Cloud and analytics. The deal, one of the largest in India's smart metering space, will bolster Airtel's rapidly expanding IoT deployment across various sectors.

Airtel's IoT proposition includes its proprietary platform, the 'Airtel IoT Hub', hosted on Airtel's cloud network. This hub enables advanced analytics, real-time tracking, and monitoring of smart meters while ensuring telco-grade security. Ganesh Lakshminarayanan, CEO of Airtel Business, highlighted that this strategic move positions Airtel as a key player in realising the Indian government's vision of digitising 250 million conventional meters into smart meters.

IntelliSmart Infrastructure's CEO, Anil Rawal, emphasised the importance of Airtel's role as a strategic partner, considering the scale of India's smart metering program and the need for robust infrastructure solutions. The government aims to replace 250 million traditional

meters with smart meters in the next five years, aligning with its Advanced Metering Infrastructure (AMI) initiative.

This partnership builds on Airtel's momentum in the IoT space, with the company already connecting over 20 million devices through its IoT solutions across India. Airtel's IoT services cater to various industries, including automobile, energy, utilities, logistics, financial services, and manufacturing, offering secure and dedicated private networks for data transmission across connected devices. The collaboration underscores Airtel's commitment to driving digitisation and innovation in India's evolving telecommunications landscape.

Wipro helps Marelli to develop cabin digital twin

Technology services and consulting company, Wipro, has assisted Marelli Electronic Systems, a mobility technology supplier, in developing its cabin digital twin. The technology simplifies simulations, validation, and testing processes, eliminating the need for physical cabins and reducing prototyping costs by up to 30%. The virtual cabin replica operates concurrently in the cloud, leading to a 70% reduction in development time. Marelli's solution supports over-the-air software updates, allowing OEMs to quickly address customer demands.

The automotive industry, facing increased software and data complexity, must establish profound software competence in the cloud while maintaining cost efficiencies, reducing deployment time, and enabling frequent updates throughout a vehicle's lifetime.

Leveraging Wipro's Cloud car and extensive Artificial Intelligence and Machine Learning ecosystem, Marelli created a smart, automated cloud-based solution for testing, validating, and updating Software-Defined Vehicle (SDV) features, reducing the time required for new software updates. Wipro's cloud and containerised

microservices enabled the swift implementation of new features, resulting in cost savings and streamlined software updates.

Yves-Antoine Brun, Vice President and Head of Wipro Engineering Edge Europe, expressed excitement about leveraging software engineering expertise to bring a connected, cloud-native solution to the market. Roberto Secchi, Head of Software Platform and DevOps at Marelli Electronic Systems, highlighted the multi-year partnership with Wipro and the role of Wipro's broad SDV talent pool in creating this groundbreaking innovation.

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- Connected Future
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- Satcom Innovations
- Monetization and User Experience
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- Digital Transformation
- IoT in Business
- Real-world Applications
- Sustainable Connectivity

KEY HIGHLIGHTS

- Full day conference & awards
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- Reach 5,000+ industry professionals
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- Demo Zone

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