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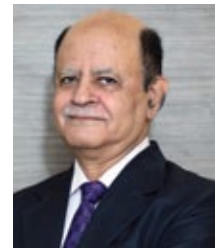

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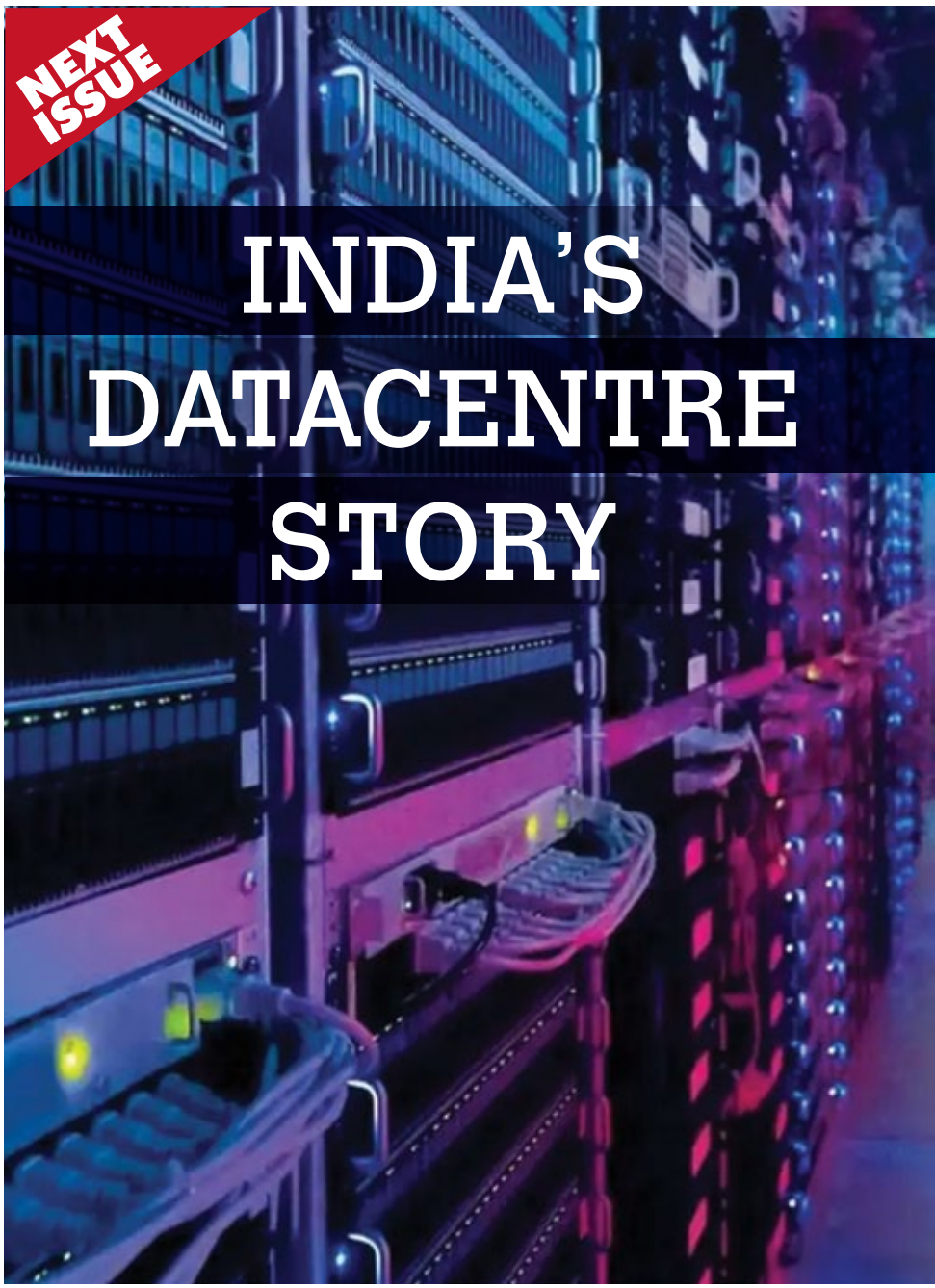

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SHUBHENDU
PARTH

[OPENING NOTE]

Collaborate for tech sovereignty

In an era defined by rapid technological advancements, a call for collaboration resonates more powerfully than ever. Recently, President of Russia Vladimir Putin expressed his eagerness to push for collaboration at the BRICS level, focusing on cutting-edge computing technology and data processing. This proposition holds immense promise, particularly from the perspective of technology sovereignty, as India embarks on an ambitious journey to establish its prowess in indigenous technology.

Putin's overture for collaboration, articulated at the Future Technologies Forum in Moscow, underscores a desire to unite two formidable technology giants—India and China—against the hegemony of certain global powers. Drawing parallels to Russia's history of confronting challenges with innovation and industrial development, Putin emphasised the importance of forging mutually beneficial technological alliances.

Within this context, India emerges as a natural partner. Notably, both India and China have maintained a neutral stance in the recent Ukrainian conflict, signifying their potential for impartial collaboration. Alexey Fedorov, Principal Investigator of the Quantum Information Technologies group at the Russian Quantum Center (RQC), underscores the collaborative potential when he states: "It is important for India and China to collaborate because together we can make things which are very hard to do alone."

Ruslan Yunusov, Chief Executive and Co-founder of RQC echoes this sentiment, expressing optimism about future collaborations with India. Plans to establish laboratories specialising in cold atoms, two-dimensional materials, and semiconductors underscore the depth and breadth of this partnership.

Essentially, cold atoms, envisioned as qubits, hold immense potential for quantum computing. Leveraging cooling lasers and optical techniques, these atoms can be manipulated to create robust quantum registers. Similarly, 2D material systems offer opportunities for quantum computing, quantum communication circuits, and quantum sensing schemes.

For India, the potential gains from collaboration with Russia extend beyond the realm of quantum computing. India's Department of Science and Technology (DST) is actively crafting a vision document to drive the Rs 6,003-crore National Quantum Mission (NQM). This initiative aims to nurture the quantum computing ecosystem through strategic funding and partnerships. With a focus on quantum technologies encompassing computing, communications, metrology and sensing, and materials, the NQM is poised to catalyse transformative technological progress.

The collaboration between India and Russia aligns seamlessly with India's quantum mission. As the mission strives to create 1,000-qubit quantum computing power in eight years and a secure quantum network via satellite spanning 2,000 km, India can benefit from Russia's expertise. Notably, India is also aiming to implement inter-city quantum key distribution over 2000 km, long-distance secure quantum communications with other countries, and establish a multiple-node quantum network with quantum memories.

In an interconnected world where technological sovereignty is paramount, forging strong bilateral ties becomes indispensable. Hence, the possibility of an Indo-Russia collaboration represents an alliance of shared values, mutual respect, and technological prowess. By leveraging Russia's advanced capabilities in quantum computing and other cutting-edge technologies, India can expedite its journey towards technological self-reliance and assert itself as a global technology powerhouse.

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[INDUSTRY SPEAK]
STRATEGY

Telcos' path to digital transformation

Telcos must adopt horizontal architectures, moving beyond siloed network functions to offer competitive services and platforms beyond connectivity

BY ARVIND KHURANA

The transformation of telecom operators (telcos) or communication service providers (CSPs) into Digital Service Providers has been underway for the better part of the last decade, though progress has been sluggish. During the last few years, telcos have made multiple attempts to modernise their networks and shift away from the architectures that featured vertical stacks and siloed network functions.

The urgency of these transformation efforts has been heightened by the hyperscaler community's continuous progress in developing high-value network-related services on top of the telecom infrastructure. Hyperscalers benefit from their horizontally architected infrastructure, allowing them to address vertical industry use cases that demand scalable compute resources like Infrastructure-as-a-Service (IaaS) or Platform as a Service (PaaS). To remain competitive globally, telcos

> To differentiate from hyperscalers, telcos must bundle a variety of value-added services like SDWAN, CDN, and Private 5G Services into their cloud offerings.

THE DX ESSENTIALS

- **Embrace Horizontal Architectures:** Telcos should move away from siloed network functions and adopt horizontal architectures that enable scalability and flexibility, allowing them to offer a wide range of digital services beyond mere connectivity.
- **Implement Network as Code:** By abstracting network complexities and exposing capabilities through programmable methods like APIs and SDKs, telcos can bring openness and programmability to their networks, fostering new value creation and developer ecosystems.
- **Focus on Customer-centricity and Automation:** Telcos must prioritise customer needs and preferences, shifting from network-centric operations to customer-centric approaches. Automation plays a pivotal role in digitising network and IT systems, enabling closed-loop automation in daily operations.
- **Diversify Cloud Offerings:** To differentiate from hyperscalers, telcos should bundle a variety of value-added services like SDWAN, CDN, and Private 5G Services into their cloud offerings, adopting flexible pricing models to attract customers.
- **Foster Partnerships and Ecosystem Awareness:** Telcos may partner with specialised technology providers to develop and manage scalable telco-grade solutions. Staying aware of global ecosystem evolution is essential to adapt swiftly to industry changes and remain competitive in the digital era.

> Network as Code fosters openness and programmability in the network, facilitating developer and vertical ecosystems for new value creation.

must adopt a similar strategy and evolve into Digital Service Providers or TechCos, offering services and platforms that extend beyond mere connectivity to enterprise customers.

Telcos have made some progress in moving beyond traditional capex-based models towards subscription and as-a-service offerings but there is still plenty of work to be done. New, horizontal architectures will mean that all the elements of network service at the application, infrastructure or network layer will increasingly need to be accessed by APIs, which would support horizontal representations that can hide the rising complexity in the network. Complexity is further increased with the advent of new technologies like 5G and edge computing leading to a shift towards decentralised architecture with the adoption of container-based applications.

RX FOR DIGITAL TRANSFORMATION

The concept of Network as Code abstracts the underlying complexity of networks and their operations, exposing capabilities through simplified programmable methods like business APIs and SDKs. It brings openness and programmability to the network, enabling the inclusion of developer and vertical ecosystems for new value creation.

Telcos have made some progress in moving beyond traditional capex-based models, but there is still plenty of work to be done.

Telcos also have a drive to transform their operations from network-centric to customer-centric due to increasing competition, both from within and outside the industry. To achieve this, telcos will need to embrace automation in a big way via digitisation across their networks and IT systems.

The industry offers technology solutions that can help telcos achieve closed-loop automation in their daily network and service operations. Telcos also need to address changing consumption behaviour of customers with the availability of local content and enablement of low latency use cases, especially for entertainment, like Augmented Reality, Virtual Reality, and gaming.

Moving forward, in their bid to differentiate from hyperscalers, telcos can also bundle a range of services in their cloud offerings, such as value-added services like SDWAN, CDN, and Private 5G services. However, they need to learn from the flexible pricing models that the hyperscalers offer.

TAPPING NEW OPPORTUNITIES

Some telcos have taken different approaches to expand beyond their connectivity roots. Rakuten Mobile and Reliance Jio have developed their own technology stacks to design their networks and services. However, building and managing an in-house operational stack requires engineering skills that are hard to attract and retain. Additionally, due to a lack of awareness of ecosystem evolution globally, the telco may find it challenging to build a scalable telco-grade solution and manage its roadmap.

Technological advances such as 5G, Edge and horizontal clouds are empowering asset-intensive industries to embrace data-driven processes and zero-touch automation, transforming the way man-machine interactions happen. Telcos are in a prime position to tap this emerging enterprise opportunity, which is at the heart of Industry 4.0.

Telecom operators in India are following the path of their global counterparts, transitioning from vertical clouds that initially served their internal needs to horizontal architectures for new customers and business models. Moreover, there is a growing trend towards sovereign clouds in response to rising geopolitical and cybersecurity concerns, with governments emphasising the importance of keeping locally generated data within their borders.

As the industry moves forward, embracing these transformations will be crucial for telcos to stay competitive and meet the evolving demands of the digital era. The future of Indian telecom operators lies in their ability to adapt swiftly and leverage these advancements for sustainable growth.

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The Cloud quagmire

Despite the strides made in its adoption, the Cloud landscape in India faces several challenges, primarily related to the policies governing its usage

BY VIJAYANT GAUR

As technology rapidly advances, Cloud computing has emerged as a game-changer, revolutionising the way organisations store, access, and manage data. In India, the Cloud landscape has significantly transformed, particularly from the government and e-governance perspectives. There are changes in trends, challenges, and opportunities in India's Cloud ecosystem, while critically analysing the gaps and lacunae in existing policies.

In recent years, the Government of India has taken notable strides in adopting Cloud technology to improve its digital infrastructure and enhance public service delivery. With initiatives like the Digital India campaign, the government aims to empower citizens by leveraging Cloud services to deliver e-governance

> The cross-border nature of Cloud services raises jurisdictional issues, making it difficult to ascertain which country's laws should apply in case of legal disputes.

> Clear regulations are necessary to safeguard citizens' sensitive information and instil confidence in Cloud-based systems.

solutions efficiently. One of the key advantages of Cloud adoption for the government is cost optimisation. The government can save substantial capital expenditure and operational costs by transitioning from traditional on-premise infrastructure to Cloud-based platforms. Moreover, the scalability and flexibility offered by Cloud services enable efficient resource allocation, ensuring that public services can be rapidly scaled up during emergencies and disasters.

E-GOVERNANCE AND THE CLOUD

The e-governance landscape in India has significantly benefited from Cloud technologies. Cloud-based solutions have facilitated the seamless integration of various government departments, enabling a centralised approach to data management. This has streamlined processes, reduced bureaucratic bottlenecks, and enhanced service delivery to citizens.

One notable success story is the Aadhaar project, India's biometric identification system. By leveraging Cloud infrastructure, the government has been able to store and process massive volumes of data, ensuring citizens can access essential services effortlessly. However, the success has also led to data privacy and security concerns, prompting the need for robust policy frameworks.

POLICY GAPS AND LACUNAE

There is no doubt that Cloud has transformed the way government organizations and citizens access and utilise data and services. Public sector organisations and departments are increasingly embracing Cloud technology to enhance scalability, efficiency, and cost-effectiveness.

Despite the strides made in Cloud adoption, the Indian Cloud landscape faces several challenges, primarily related to the policies governing its usage, from those related to data privacy and security, dependence on vendors, jurisdiction issues, and more. Here is a quick review of some of the concerns.

Data Privacy and Security: The lack of comprehensive data protection laws and inadequate encryption standards raise concerns about data privacy and security. Clear regulations are necessary to safeguard citizens' sensitive information and instil confidence in Cloud-based systems.

Vendor Lock-in: Many government departments and organisations have become heavily dependent on specific Cloud service providers, leading to vendor lock-in. A lack of standardised interoperability and data portability hinders seamless migration between different Cloud platforms.

Limited Rural Penetration: While Cloud services have shown immense potential in urban areas, rural regions still suffer from limited internet connectivity and awareness. Bridging this digital divide is crucial to ensure equitable access to e-governance services for all citizens.

Cybersecurity Awareness and Skill Gap: With the growing reliance on Cloud technology, there is an urgent need to enhance cybersecurity awareness and build a skilled workforce capable of mitigating cyber threats.

Jurisdictional Challenges: The cross-border nature of Cloud services raises jurisdictional issues, making it difficult to ascertain which country's laws should apply in case of data breaches or legal disputes.

Addressing the policy gaps is critical to unlocking the full potential of Cloud computing in India's government and e-governance sectors.

The author is the Head of the Cyber Security Operations Centre – Ex NHA SOC responsible for handling SOC Ayushman Bharat Digital Mission and the Pradhan Mantri Jan Aarogya Yojana.
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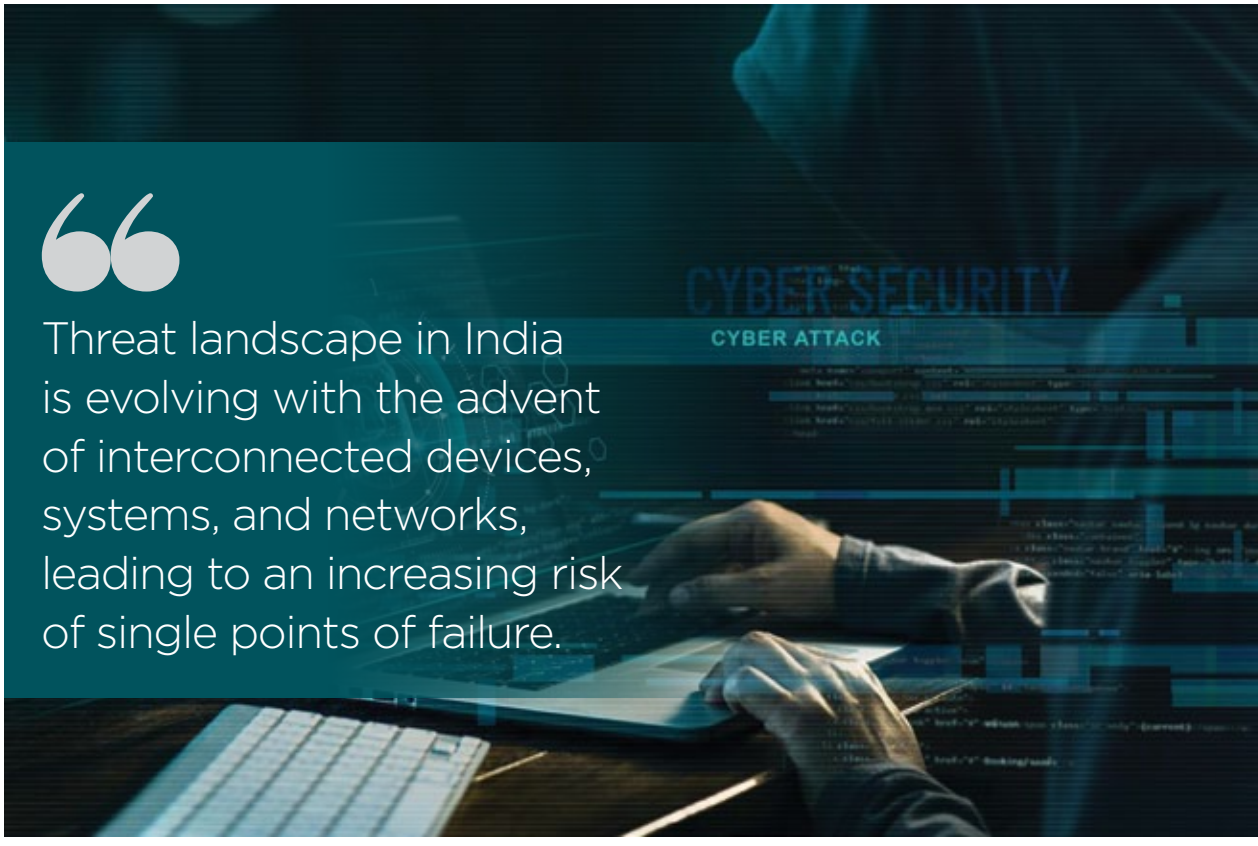
LT GEN DR S P KOCHHAR

GET READY FOR MORE CYBERATTACKS

Convergence can amplify the attack surface through a troika of increased digital access, rapid digitisation, and amalgamation of technologies

As we navigate the labyrinth of the digital age, we encounter a phenomenon where once distinct and disparate technologies are progressively knitting themselves together into a cohesive whole. This phenomenon, known as technology convergence, is an amalgamation of technologies, systems, and services, gradually adapting and merging to perform harmonising functions. With an estimated 759 million internet users as of May 2023 and a rapidly expanding digital ecosystem, India is experiencing technology convergence across a variety of sectors such as finance, healthcare, communications, and entertainment. While this process brings significant opportunities, it also poses unique challenges to India's security and privacy landscape, due to the blurring boundaries of technologies and their emerging security implications.



> Threat landscape in India is evolving with the advent of interconnected devices, systems, and networks, leading to an increasing risk of single points of failure.

> The increase in connected devices implies a proportional increase in the attack surface, requiring 5G networks to have robust security protocols in place.

EXPANDED ATTACK SURFACE

Technology convergence in the Indian landscape has drastically amplified the attack surface through a combination of increased digital access, rapid digitisation of services, and the amalgamation of technologies, such as the Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning (ML), 5G networks, and Cloud Computing.

With its burgeoning digital population and widespread adoption of IoT devices, India is a prime example of how this expansion can occur. According to Statista, an estimated two billion IoT devices existed in India as of 2021, and this number is set to exponentially rise to a staggering 25 billion by 2030. These IoT devices range from personal gadgets like smartphones and wearable tech to home automation systems and healthcare devices. However, many of these devices lack adequate security measures, thereby posing a significant security risk. For instance, the absence of robust authentication methods, outdated software, and the use of default credentials can make these devices easy targets for cybercriminals, providing them a foothold in larger networks.

Parallelly, as AI and ML technologies increasingly become integral to businesses in India, new attack vectors emerge. Adversarial attacks, a specific type of attack on ML models, can manipulate these models in subtle ways that cause them to malfunction or produce incorrect results. Given the growing reliance on these models for crucial decision-making processes, such attacks could have wide-ranging implications.

The rise of 5G networks, touted to revolutionise India's digital landscape, brings its own set of security issues. With a much larger bandwidth and lower latency, 5G is expected to connect to countless more devices and enable new applications and services. However, the increase in connected devices also implies a proportional increase in the attack surface, requiring 5G networks to have robust security protocols in place to mitigate potential threats. The introduction of network slicing, a key feature of 5G, can further complicate security management as each slice can potentially be a new point of attack for malicious entities.

The role of Cloud Computing in expanding the attack surface cannot be understated. The market for cloud services in India is projected to reach USD13 billion by 2026. While cloud services offer significant benefits in terms of scalability, efficiency, and cost reduction, they also extend the organisation's network boundaries beyond their direct control, introducing a shared security model. This model suggests that both the provider and consumer of the cloud service are responsible for security. However, if either party does not fulfil its security obligations, it can result in vulnerabilities. Furthermore, multi-tenancy in cloud services can also lead to data leakage if proper data isolation measures are not implemented.

COMPLEX THREAT LANDSCAPE

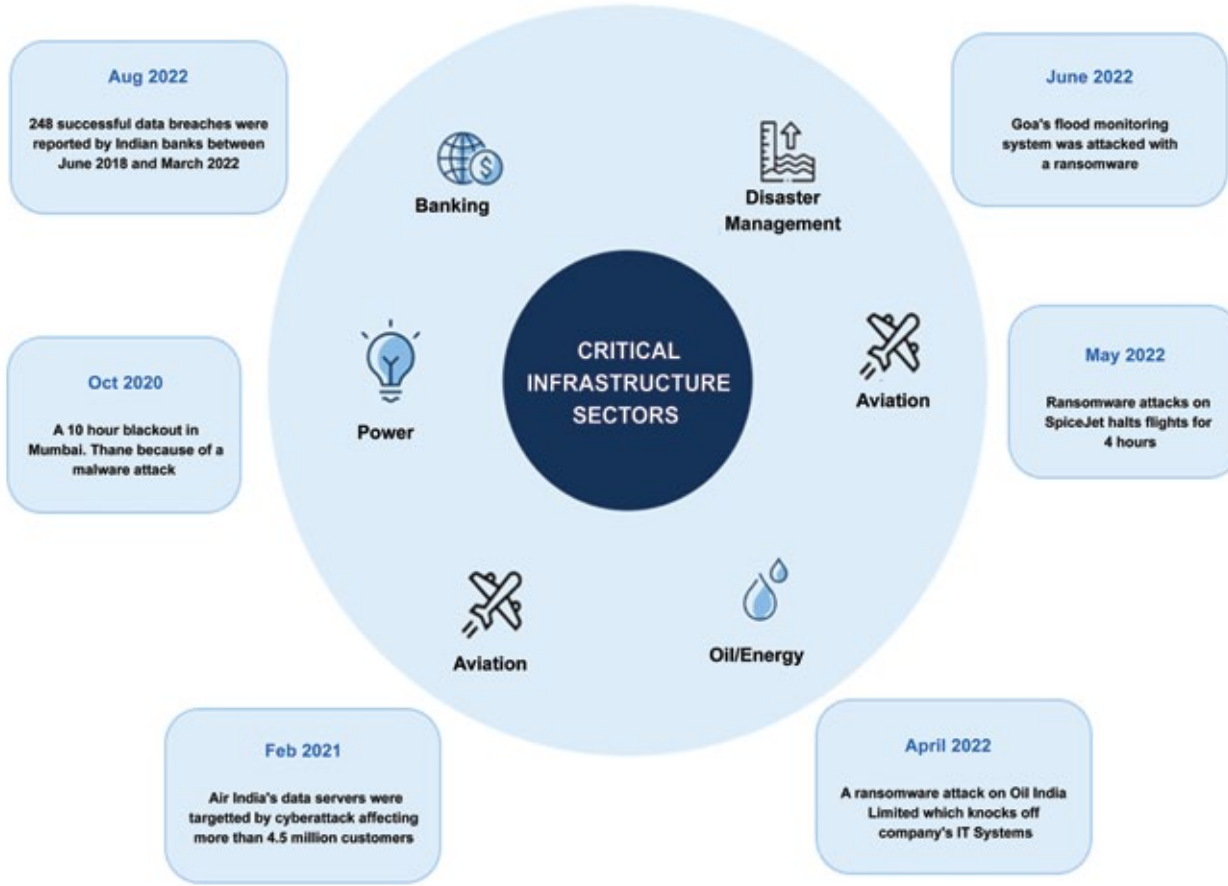
The convergence of technology in India has not only expanded the attack surface but also led to a considerable increase in the complexity of the threat landscape. This landscape is evolving with the advent of interconnected devices, systems, and networks, leading to an increasing risk of single points of failure and cascading effects.

Firstly, the sheer number of interconnected and interoperable devices that technology convergence brings forth has significantly amplified the potential for large-scale, coordinated attacks. This issue is particularly notable with IoT devices, where a security breach in a single device can compromise the entire network. An example of this was seen in the Mirai botnet attack in 2016, where numerous IoT devices were compromised and used to launch a distributed denial of service attack. With the IoT market in India expected to grow to USD27.31 billion by 2023 as per Statista, the potential for such attacks is a substantial concern.

Advanced Persistent Threats (APTs) in India have also evolved in step with the changing technological landscape. APTs are targeted, stealthy threats designed

> Network slicing, a key feature of 5G, can complicate security management as each slice can potentially be a new point of attack for malicious entities.

Cyberattacks & Security Breaches on Critical Infrastructure in India



Source: Compiled from different media reports.

to maintain a long-term presence in the target's systems, siphoning off data or causing damage without detection. These threats have begun to exploit the interconnected nature of converged technologies, making detection and mitigation even more challenging. For instance, the 'Side Copy' APT targeted the Indian government and military personnel in 2021, demonstrating the increasing sophistication of such attacks.

The advent of AI and ML in the cyber threat landscape has given rise to intelligent malware and ransomware. Such malware uses advanced techniques to evade detection, adapt to the environment, and target specific system vulnerabilities. This development has been increasingly troublesome for Indian businesses, which were among the top targets of ransomware attacks in 2020. The increasing use of AI and ML in

cyber threats poses a daunting challenge, as they can outpace traditional security defences and require new mitigation strategies.

Adding to the complexity is the increasing prevalence of cyber-physical attacks, which target the intersection of digital and physical infrastructure, such as power grids or transport systems. For example, the 2020 cyber-attack on Mumbai's power grid displayed how vulnerable such systems could be. With more physical systems becoming networked and automated, the potential for such attacks is expected to continue to rise.

GOVERNANCE, RISK, AND COMPLIANCE

Technology convergence has intensified the issues related to governance, risk, and compliance in India. The Ministry of Electronics and Information Technology (MeitY) has recognised these challenges and has taken several significant steps. While the Indian government has initiated regulation with the Personal Data Protection Bill (PDPB) and the National Cyber Security Strategy, MeitY also understands that these legal frameworks, currently under development, may not fully cover the fast-paced evolution of technology.

Emerging technologies such as blockchain and quantum computing, which India, through initiatives under MeitY, is actively exploring, bring added layers of complexity. Data protection, privacy, and cyber-physical security are pivotal areas. To tackle these, MeitY has initiated dynamic and adaptive risk management approaches, such as the establishment of the Indian Computer Emergency Response Team (CERT-In) and the Cyber Swachhta Kendra.

Furthermore, the Information Security Education and Awareness (ISEA) project has been instrumental in raising cybersecurity awareness. These proactive steps have become even more crucial considering the country's push for its Digital India and Make in India objectives.

To summarise, technology convergence presents a unique set of opportunities and challenges for India. While it offers the potential for innovation, productivity, and economic growth, it also introduces new security implications. It is critical that as technology continues to evolve and converge, so must the strategies for securing it. By understanding and addressing these emerging security implications, India can ensure a safe, secure, and prosperous digital future in the era of technology convergence.

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

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Russian Quantum Centre to develop quantum computing in the cloud

A quantum computer accessible through cloud services will allow researchers and business users to run key quantum algorithms in real-time.

PHOTO: RQC

BY SHUBHENDU PARTH

Russian Quantum Centre has signed a strategic agreement with VKontakte (VK), the Russian social media platform, to accelerate the development of quantum computing in the country using the VK Cloud platform. The companies signed an agreement on strategic cooperation, recently at the Future Technologies Forum, in Moscow.

One of the primary objectives of this collaboration is the creation of a cloud environment that will enable faster progress in quantum computing research and development. The partners envision building a quantum computer accessible through cloud services, allowing researchers and business users to run key quantum algorithms in real time. This approach is expected to address technological and infrastructural challenges and has already yielded remarkable computational results, breaking records in Russia.

Alexey Fedorov, Head – Quantum Information Technologies research group, Russian Quantum Centre, highlighted the immense potential quantum computing holds for businesses. He emphasised that quantum computers can revolutionise problem-solving in complex domains such as optimisation, modelling, and data processing. The joint effort with VK presents an opportunity to bring their quantum developments closer to a wider audience. Interest in quantum algorithms is surging not only among academic institutions and research centres but also among major corporations.

VK Tech's Managing Director, Pavel Gontarev, stressed that the advancement of quantum technologies demands powerful infrastructure and high-speed IT systems. The VK Cloud platform has shown impressive capabilities during initial tests, withstanding significant loads and offering rapid scalability based on qubit requirements. Gontarev emphasised the importance of ensuring the reliability and user-friendliness of next-generation technologies to make them accessible to a broader audience. Leveraging fault-tolerant, highly available services, tools, security measures, and a public cloud API, VK Cloud aims to simplify quantum computing processes and democratise access to these groundbreaking capabilities.

The cloud-based approach to quantum computing is gaining traction worldwide due to its potential to democratise access to this revolutionary technology. By providing access to quantum computing resources through a user-friendly platform like VK Cloud, researchers and developers can experiment and innovate without the need for massive investments in specialised hardware.

The collaboration between the RQC and VK is not only expected to accelerate the development of quantum computing, it is likely to facilitate the training of a new generation of quantum technology experts. The cloud platform will serve as a training ground for developers interested in working with quantum technologies to solve real-world problems across various industries.

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The author was in Moscow on an invitation from The Roscongress Foundation to attend the Future Technologies Forum 2023.

Ericsson and Intel to advance next-gen optimised 5G infrastructure

Ericsson and Intel have joined forces in a strategic partnership to harness the prowess of Intel's 18A process and manufacturing technology for Ericsson's forthcoming advanced 5G infrastructure. As part of the agreement, Intel will manufacture a custom 5G System-on-Chip (SoC) for Ericsson, enabling the creation of cutting-edge products for future 5G infrastructure.

This collaboration extends beyond hardware, as Ericsson and Intel are set to expand their cooperative efforts to optimise 4th Gen Intel Xeon Scalable processors with its vRAN Boost for Ericsson's Cloud RAN solutions, enhancing network capacity, energy efficiency, flexibility, and scalability for communication service providers.

As the 5G landscape evolves, the trajectory is toward programmable, open, and software-defined networks, drawing inspiration from the transformative cloud-native technologies that revolutionised the datacentre paradigm. This collaborative vision underscores the need for collective industry effort, synchronising network specifications to create a unified global standard.

Fredrik Jejdling, Executive Vice President and Head of Networks at Ericsson, expressed the significance of this alliance, emphasising its alignment with Ericsson's long-term vision for a robust and sustainable supply chain. Ericsson and Intel are at the forefront of this movement, collaborating with other technology trailblazers to deliver industry-scale open RAN solutions, setting the stage for the future of network connectivity.

Intel's roadmap introduces its most advanced node, 18A, as part of its progression through five nodes within four years. This progression, marked by innovations such as RibbonFET and PowerVia in Intel 20A, aims to reinforce Intel's leadership stance by 2025 and enhance forthcoming customer offerings.

Siemens launches test lab for industrial connectivity technologies

Siemens has announced the setting up of a state-of-the-art laboratory for industrial connectivity technologies at its Erlangen campus. Located within the Siemens Technology Center, the 300-square-metre Industrial Connectivity Lab provides a testing arena for various connectivity solutions in industrial settings, including Industrial WLAN, 5G, real-time localisation systems – RTLS, and radio frequency identification – RFID.

Highlighting the need for the lab, Axel Lorenz, CEO – Process Automation, Siemens said that the increasing convergence of OT and IT in industrial plants is creating an enormous demand for custom communication solutions. He emphasised that assessing wireless technologies' efficacy and contextual intricacies within operational contexts can be challenging for many users. The Industrial Connectivity Lab mitigates this challenge by allowing customers to explore diverse connectivity technologies and test their functionality in real-world industrial conditions. Moreover, the lab serves as a platform for training, knowledge dissemination, and Siemens' internal technology assessments.

The lab's scope includes comprehensive testing of 5G applications, facilitated by Siemens' private 5G license covering the entire Siemens Technology Center Erlangen. The lab features an integrated, proprietary 5G infrastructure. Industrial WLAN is also accessible within the lab's ecosystem. Precise testing of localisation solutions is enabled through the on-site RTLS system, accommodating various scenarios.

Additionally, users have access to industrial identification solutions using RFID. The lab further facilitates the study of remote control and remote maintenance setups through a DSL connection. The lab will also enable enterprises to seek expert guidance from Siemens professionals.

Nokia helps MobiFone reduce network energy usage by 14%

Nokia has announced that it has helped MobiFone achieve overall energy savings of almost 14% through the implementation of its Digital Design service. Based on data gathered from the network with Nokia's analytics tools, MobiFone implemented power reduction in 88% of the 4G radio cells in the trial.

To achieve the result, Nokia transitioned MobiFone from conventional network-wide or cluster-wide power settings to cell-level settings, which helped them find an optimal radio link and power balance with overall lower transmit power. The pilot was conducted at 112 cell sites spanning 65 square kilometres in Vietnam's Ngu Hanh Son district. As part of the trial, Nokia Digital Design service was applied in MobiFone's 4G 1800 MHz (band 3) layer.

Nokia Digital Design service analyses each individual cell in the network to assess interference, load, and beam-set configuration. The service then recommends a refined radio link power balance, effectively minimising transmit power. This reduction strategy extends beyond low-traffic hours, effectively addressing peak-hour power consumption and fostering substantial energy savings.

With the Radio Access Network (RAN) accounting for nearly 80% of total mobile network energy consumption, this breakthrough holds tremendous significance. Lowering RAN energy usage offers far-reaching benefits, contributing to overall energy reduction for service providers.

Rubén Morón Flores, Head of Market Unit Vietnam at Nokia, highlighted the trial's significance, showcasing how mobile operators can enhance user experiences while lowering energy consumption. The success of this trial serves as a catalyst for other service providers to adopt similarly energy-efficient solutions, Flores said.

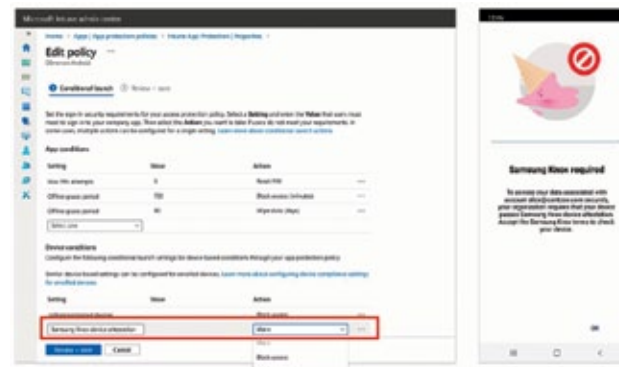
Samsung, Microsoft unveil on-device attestation solution

Samsung Electronics and Microsoft have announced a partnership aimed at redefining mobile device security for businesses. The collaboration has resulted in an industry-first on-device, mobile hardware-backed device attestation solution that caters to company- and personally-owned devices.

Device attestation is crucial in ensuring a device's identity and health, verifying its integrity and lack of compromise. The solution, available on Samsung Galaxy devices and complemented by Microsoft Intune protection, delivers advanced security and flexibility. For enterprises, this collaboration offers an additional layer of protection against compromised devices falsely presenting themselves as legitimate, potentially gaining access to sensitive corporate data.

Mobile hardware-backed attestation represents a paradigm shift, allowing enterprises to verify device integrity and facilitate corporate system access, regardless of management status. This innovative approach streamlines user experiences, enabling secure interaction of personal devices within corporate realms. Samsung and Microsoft's collaborative efforts are set to reshape the landscape of mobile device security.

This joint initiative simplifies matters for enterprise IT managers, as mobile hardware-backed device attestation



with Intune provides robust corporate protection without hindering the user experience. Highly regulated entities can now adopt BYOD policies with added security for Samsung devices, commonly used by professionals and consumers alike. This approach improves productivity, user experience, and administrative procedures.

The solution functions across both managed and unmanaged devices, irrespective of ownership. Unlike traditional device attestation, which mainly caters to managed devices and necessitates network connectivity, the solution ensures device integrity across the board. Employees can smoothly utilise personal devices within corporate systems, eliminating security hurdles.

ZTE, China Mobile verify technology for wireless network digital twin

ZTE Corporation and China Mobile have announced that they have jointly completed the research and laboratory verification of key technologies for their wireless network digital twin. This includes multi-service twinning, wireless channel twinning, and intelligent optimisation decision-making based on ZTE's high-fidelity wireless network digital twin platform.

This successful verification lays the technological foundation for cooperation between China Mobile's new-generation AI open platform and ZTE's digital twin platform and efforts towards improving wireless network intelligence and promoting technological innovation that empowers operators' digital transformation journey.

The multi-service twinning technology employs temporal Generative Adversarial Networks (GAN) to replicate real video services, such as iQiyi, Youku, and Tencent, within the digital twin environment. Remarkably, the application's fidelity remains remarkably high, with a controlled packet mean error of less than 10% when compared to real-world scenarios. This precision offers the capability to assess real applications' impact on user behaviour, network scheduling capabilities, and performance metrics with exceptional accuracy, facilitating informed decisions and efficient wireless network optimisation.

Wireless channel twinning achieves high-fidelity emulation of wireless channels in physical networks, leveraging specific channel characteristics for improved twinning precision. The RSRP error of the twinned wireless channel is limited to 2 dB, while major air interface indicators, including throughput, maintain errors within 15%. For outdoor wireless channels, intelligent prediction technology reduces the standard deviation between predicted and measured RSRP values to below 3 dB.

Driven by multifaceted applications, this collaboration aims to enhance precise planning, efficient optimisation, and simplified intelligent operations and maintenance, unlocking the potential of pivotal digital twin technologies.

Dell launches platform to optimise secure Edge deployments

Dell Technologies has introduced Dell NativeEdge, an edge operations software platform, designed to help businesses simplify and optimise secure edge deployments. The platform enables businesses to enhance edge operations across a multitude of devices and locations, spanning from edge to core datacentres and multiple clouds.

The edge operations software platform promises secure device onboarding at scale, remote management, and orchestration of multicloud applications. This purpose-built platform is equipped to address diverse enterprise edge use cases with zero-touch deployment and open system design. Furthermore, it integrates with various hardware components within Dell's comprehensive portfolio. With built-in Zero Trust capabilities, Dell NativeEdge reduces security risk by protecting customers' applications and infrastructure across their entire edge estate.

Jeff Clarke, Vice Chairman and Co-Chief Operating Officer at Dell Technologies emphasised the complexity of data movement and the challenges of managing distributed architectures. He noted, "Dell NativeEdge puts them in the driver's seat, so they can manage and simplify their entire edge estate with a single solution, helping deliver better experiences, products, and outcomes."

The company expects the new platform to expedite deployment times and generate cost savings. For instance, in the manufacturing sector, the solution can significantly expedite edge asset deployment times, enabling quicker and more efficient order fulfilment processes. A Dell study showcased the potential economic impact, revealing up to 130% return on investment from a three-year investment in NativeEdge for edge asset management.

CommScope announces three new Ruckus networks solutions

CommScope has introduced three solutions under the Ruckus Networks brand, offering enterprises and service providers innovative ways to deploy, manage, and operate purpose-driven networks for the future. These solutions bring distinct advantages individually and together create a robust framework for delivering dependable user experiences, addressing coverage and mobility challenges, and easing the operational burden on IT organisations.

The AI-powered Ruckus One cloud-native platform presents a unified dashboard for network assurance, service delivery, and business intelligence. It streamlines converged network management across multi-access public and private networks, providing a comprehensive solution.

The Network as a Service (NaaS) program introduces a new operational and financial model. Businesses can now opt for subscription-based networking solutions and services, eliminating the need for upfront capital expenditure on network equipment. This program offers the flexibility to outsource network operations to Ruckus and its channel partners, along with the option of utilising CommScope Financial Services' traditional leasing or hardware-as-a-service finance models.

Complementing NaaS, the multi-access public and private (MAPP) solution simplifies the deployment and operation of networks. It facilitates private cellular deployment and enables converged networks using a mix of Wi-Fi, IoT, wired, and private cellular. This solution is particularly suitable for businesses requiring private cellular solutions for applications like smart manufacturing, allowing seamless integration with existing IP network infrastructure.

The Ruckus One platform is globally available. The NaaS and 4G/5G solutions are currently available only in the US and the company expects to soon launch it in the global market.

HPE expands PhoenixNAP's Bare Metal Cloud with next-gen servers

Hewlett Packard Enterprise has announced that PhoenixNAP, a global IT services provider, is expanding its Bare Metal Cloud platform with cloud-native HPE ProLiant RL300 Gen11 servers, using energy-efficient processors from Ampere Computing. The expanded services support AI inferencing, cloud gaming and other cloud-native workloads with improved performance and energy efficiency.

Enterprise IT today demands mobile-ready, video-intensive, and AI-enabled workloads, which require exceptional performance and consume more power. With energy consumption by datacentres expected to more than double between 2022 and 2027, from 382 TWh to 803 TW1, datacentres and cloud computing will need to deploy a combination of renewable energy and more efficient computing to mitigate the carbon impact of cloud and AI growth.

The HPE ProLiant RL300 Gen11 enables PhoenixNAP to provide next-generation compute performance with energy consumption savings. The server is designed for service providers and digital-first enterprises running cloud-native workloads. PhoenixNAP plans to leverage the HPE servers across its network of 18 datacentres on five continents.

Part of PhoenixNAP's commitment is to instantaneously deliver cost-effective, API-driven IT solutions that enable every type of company to effortlessly set up, manage, scale, and automate high-performance server infrastructure with cloud-like ease and simplicity, bringing apps and workloads closer to their teams and users. Its Bare Metal Cloud lets customers automatically provision and manage HPE ProLiant RL300 Gen11 servers with powerful 80-core Ampere Altra CPUs running at 3.0 GHz per core.

This solution helps customers maximise compute density and reduce the total cost of ownership through simplified management and lower energy consumption.

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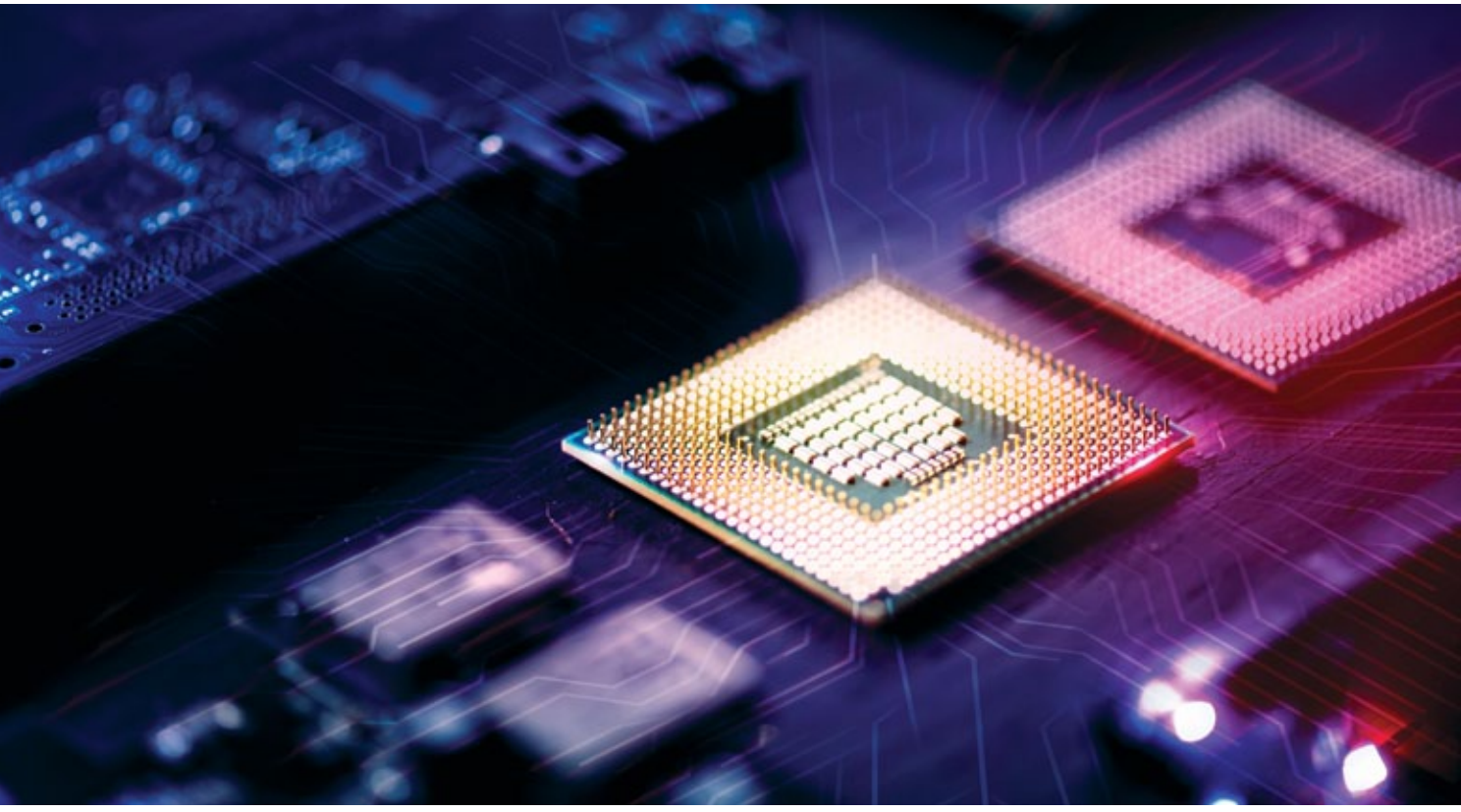
[NEWS ANALYSIS]
SEMICON INDIA

The new semiconductor game plan

With Micron's plant, Vedanta's new partnership, and AMD and Applied Materials' million-dollar ventures, India's networking market could get a major boost



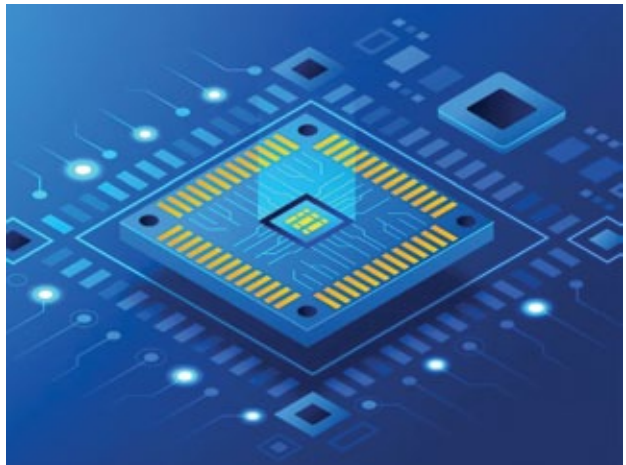
BY VERNIKA AWAL

On 22 June, US memory chip major Micron became the first benefactor of India's USD 10 billion semiconductor production-linked incentive (PLI) scheme. A month later, the Centre hosted Semicon India 2023, the largest semiconductor conference in India to date. Helmed by Prime Minister Narendra Modi, the event featured multiple notable stakeholders of the global semiconductor industry, including Young Liu, Chairman of Hon Hai Precision Industry Co (Foxconn), Mark Papermaster, CTO of AMD, and more.

The spree of activity in the semiconductor space saw India draw a spate of investments, with Micron's USD 825 million (which adds up to USD 2.75 billion including government subsidy), and Applied Materials and AMD's

> While India does not have a chipmaking market share at the moment, it designs nearly 20% of global chips, thanks to its skilled engineering workforce.

Semicon India 2023 saw a spate of investments, including USD 825 million by Micron and USD 400 million each by Applied Materials and AMD.



IN SHORT

- With Semicon India 2023 conference, the Government of India has signalled the semiconductor firms to consider setting up operations in the country.
- India aims to establish chip assembly and packaging facilities to supply chips to vendors locally and globally.
- The conference showcases India's position as a leading chip design hub, with a skilled engineering workforce and AMD's plans to hire 3,000 more employees in Bengaluru.
- Geopolitically, India's semiconductor industry can reduce global dependency on Taiwan, which presently makes more than half of the world's chips.
- India's focus on developing the semiconductor industry is a strategic move to enhance cyber security by ensuring self-reliance on networking and communications equipment.

USD 400 million each leading the fray. This could have a far-reaching impact on India's quest to build its semiconductor ecosystem and play a major strategic role in the long run.

ARE THE INVESTMENTS SIGNIFICANT?

For a start, yes. Industry experts say that the biggest advantage that India will draw from Semicon India and its peripheral announcements is in signalling firms in the semiconductor supply chain to consider setting up shop in India.

For instance, with Applied Materials and AMD setting up engineering and research operations in India, the two companies will contribute to generating chip design and research in the country. This, in turn, will see them supply these designs to startups and smaller chip design firms, who can licence these technologies to build custom chips for various purposes.

But, to do so, these startups will require companies to offer supply chain solutions, such as raw ingredients, specialised machinery, skilled workforce and more for these chips to be built and designed.

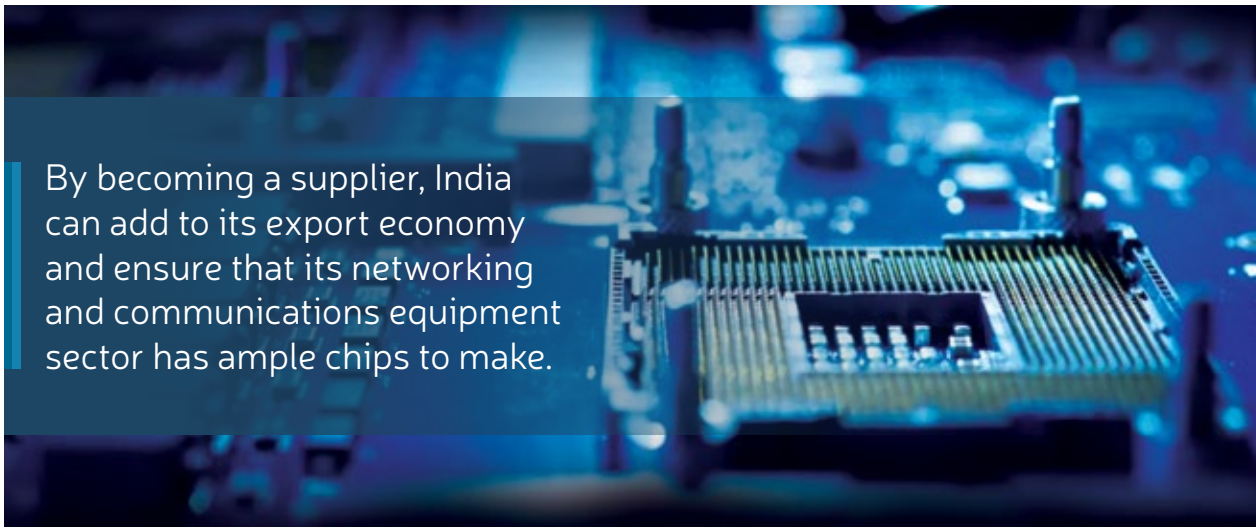
It is for this that groundwork is being laid down, and Semicon India was pivotal to that effect.

CAN INDIA MAKE ITS CHIPS?

Well, not quite. Or, not yet, to be specific. The reason for this is that chipmaking is an incredibly complex and multi-tiered procedure. Setting up chipmaking in any destination requires a constant supply of electricity and clean water, as well as multi-billion-dollar investments that contribute towards setting up sophisticated machinery for fabrication.

It is because of these constraints that chipmaking right now is concentrated across a select few geographies like Taiwan and China. India, in this regard, aims to break into this fold.

However, the starting step for this will come through Micron's chip assembly, testing and packaging facility where chips will be tested for efficacy and 'packaged' into units that are deployable in products. Think of this



as taking the core semiconductor chip, and packaging it into a system-on-chip (SoC) integrated circuit that is then used in products such as servers, routers, and more.

Having assembly facilities is crucial since this helps in setting up a market of chip supply to vendors in the country and globally as exports. Micron, for instance, produces NAND flash storage chips and memory chips that are used by enterprises in data centres, private and public networking equipment. From its India facility, the company can produce these chips that are then supplied to global networking majors, such as Nokia and Cisco, to be used in their products.

THE IMPORTANCE OF SEMICON INDIA

The Semicon India conference was a shot in the arm from the Centre, signalling its intent to create a market that attracts global chip suppliers. Conferences such as these also rope in startups that are looking to innovate with various chip designs that solve enterprise purposes, for instance, with custom chips that reduce latencies in optical fibres, and create faster chips for enterprise routers.

By announcing engineering and R&D initiatives, Semicon India also showcased the country's position as a leading chip design hub. While India does not have a chipmaking market share at the moment it designs nearly 20% of global chips, thanks to its skilled engineering workforce. Companies are investing accordingly as well. AMD, for instance, announced that it will hire 3,000 more employees in its largest global engineering hub in Bengaluru which is being set up. This will bring its workforce in the country up to 9,500, a major centre for a fabless chipmaker like AMD.

Mark Papermaster, during his session at Semicon India on 28 July, added that Indian engineers already contribute to both enterprise and consumer-end chips across AMD's entire portfolio. Going forward, the company will see contributions ramp up further from India.

THE GEOPOLITICAL ADVANTAGE

At the crux of setting up the entire semiconductor industry is clear geopolitical leverage. Taiwan, which presently makes more than half of the world's chips, stands in a precarious position in terms of its proximity and relations with China. However, Taiwan makes its chips based on intellectual property on chips held by the USA. With relations between the US and China souring, Taiwan comes under a line of fire, which could put the global chip ecosystem on a tense edge, a factor noted in Chris Miller's 2022 non-fiction novel, Chip War.

India, in this regard, can establish its supply chain of chips that reduces dependencies on geopolitical conflicts and relations. By becoming a supplier, India can add to its export economy, while ensuring that its networking and communications equipment sector has ample chips to be made. Given that such equipment is crucial in the core operations of any modern global major economy today, independence regarding manufacturing networking hardware is also critical at the cyber security forefront.

It is this advantage that India can eventually leverage. Doing so, however, is not an overnight task; it is a process that will take a decade to establish. With events such as Semicon India, the nation is taking foundational steps to cater to the upcoming decade.

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Why do feature phones make business sense for Jio?

Jio's primary plan for the Jio Bharat 4G feature phone ecosystem is to convert non-data users into data users, thereby tapping the vast 2G subscriber base

BY VERNIKA AWAL

On 7 July 2023, telecom operator Reliance Jio fired its latest salvo to procure more subscribers with a long-term network effect. The product in question is a humble feature phone, called Jio Bharat 4G. In terms of its overall features, the device is as basic as what you could expect today, a 1.77-inch display, storage mostly via microSD memory cards, and a physical alphanumeric keypad that has increasingly become a rarity.

Yet, Jio's ploy behind this new feature phone is multi-faceted. For one, the 'Jio Bharat' tag refers to not just one phone; according to Jio, it is the entire platform. The latter is being pitched to manufacturers and third-party brands, who can sign associations with Reliance Jio to make devices for this platform. Eventually, Jio plans to create an ecosystem of devices under this platform, wherein original equipment manufacturers (OEMs) get paid by Jio for offering a supply chain to this brand.

Talks of developing Jio Bharat as a platform were confirmed by Kiran Thomas, President of Reliance Industries in a report published by a business newspaper.

GOING BACKWARDS TO MOVE FORWARD

So, why is Jio eyeing a feature phone platform at a time when smartphones are the norm, and 5G is knocking on the door? The answer lies in the total base of users in India that still use feature phones.

By definition, feature phones are basic, and are mostly used by those who are still not a part of India's burgeoning data economy. These users are voice-only subscribers of telecom networks. According to market research firm

> The Jio Bharat 4G ecosystem could attract 100 million new users over time, enabling the company to earn nearly Rs 50,000 crore over four years.

Counterpoint, India still has over 250 million feature phone users. Industry analysts also indicate that Bharti Airtel, Jio's biggest rival in the country, holds nearly 50% of this market.

UNDERSTANDING THE ECONOMICS

Industry and media reports indicate that the Rs 999 Jio Bharat 4G feature phones do not necessarily make any money for the telco. In fact, Jio is most likely not even looking to make money from hardware here. Rather, the move is aimed at bringing in 2G users from the competition under the Jio fold.

To do this, Jio is offering a bundled Rs 123 monthly recharge plan, which is nearly 25% more expensive than Airtel's Rs 99 monthly voice plan that the feature phone users mostly subscribe to. However, for this higher-priced monthly subscription plan, Jio is offering content streaming through JioCinema, music streaming through JioSaavn, and access to the Unified Payments Interface (UPI) payment mechanism via JioPay.

Essentially, Jio's primary plan for the Jio Bharat 4G feature phone ecosystem is to convert non-data users into data users, thereby removing the roadblock of not having a 2G spectrum. The other avenue for Jio to do this would have been to procure spectrum, but the latter has multiple regulatory hoops, is expensive, and in a market that is gradually but adopting 5G steadily, it does not make business sense for Jio to acquire 2G spectrum.

By creating an ecosystem, however, Jio is not only generating revenue but also generating long-term operating margins which in turn will lead to profits. Media reports, citing analysts estimate that overall, Jio will be earning about Rs 5,000 per user in a span of four years.

THE EVENTUAL IMPACT

Assuming that the platform becomes successful, industry analysts estimate that the Jio Bharat 4G ecosystem could attract 100 million new users over time. At the above-mentioned revenue per user, Jio stands to earn Rs 50,000 crore, or over USD 6 billion, from the ecosystem. Therefore, incentivising OEMs to participate by offering a margin for supplying the hardware seems to make business sense for Jio.

The latest edition of the Ericsson Mobility Report, published in June, highlights that India will have over 700 million 5G users by 2028, and Jio is most likely preparing for this; roping in users from the 2G fold will help the company create network effects for digitised services among the users. In time, these users will eventually look to upgrade to smartphones, which will also get 5G across the entire smorgasbord of price brackets of phones in India.

5G, in turn, will also deliver higher per-user revenue for Jio. This, in turn, means that in the long run, Jio could stand to generate far higher revenue than the projected USD 6 billion figure.

CAN AIRTEL KEEP PACE?

By incentivising OEMs to build the platform under the Jio Bharat tag, the company is aiming to kill another bird with the same stone. The move is likely to help Jio move competition away from the feature phone marketplace. Data from Counterpoint showed that Transsion Holdings' Itel, domestic firm Lava, and the beleaguered version of Nokia, cumulatively hold nearly 80% of the feature phone market as of H1 2023.

By prompting such OEMs to join the Jio Bharat 4G platform, the company could enable better margins than the super-slim per-device margins that feature phone OEMs earn at the moment. This, in turn, will push a consumer towards eyeing the Jio ecosystem as the one that has more compelling choices in the feature phone industry.

But Jio Bharat 4G feature phones are network-locked, which essentially means that Jio will, over time, direct ample compelling options away from Airtel's potential customers. If the latter comes looking for a new feature phone in the years to come, Jio wants to be the tag visible on retail shelves.

Airtel, on this note, may have its task cut out — it will, of course, look to rival the platform with offers that see its 130 million-plus 2G feature phone users upgrade to Airtel's own 4G network, and not migrate to Jio.

How, though, would that pan out? Only time will tell.

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TELCOS & THE CLOUD

A BARBENHEIMER SHOWDOWN

Telcos are exploring the opportunity to offer Cloud services – a sneak peek at whether they can make it to the front row of providing enterprise services in India

BY PRATIMA HARIGUNANI

Who could have thought that a movie about Barbie would be about the existential crisis? Who could have thought that the maker of the atomic weapon would be painted with Nolan's lens? Who would have thought these completely different characters face similar questions of conflicts and grand follies? And, of course, who could have thought that people would queue up for these seemingly poles-apart movies on the same weekend?

The cloud landscape in India can surprise us in a similar way. The playfield of the hyperscalers can turn into the battlefield of telcos. It can be a world full of pink atomic dust. Where both protagonists face similar dilemmas and plot twists. It can be an unusual time for them to not necessarily cross swords but use this chance to reach out to a bigger crowd. And solve bigger questions.

Is that going to be easy? Nah. Is that going to be worth a shot? Oh sure!

After all, we are talking about a billion-dollar market here. The India Public Cloud Services (PCS) market, including Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) solutions, and Software-as-a-Service (SaaS)) revenue totalled USD 6.2 billion for 2022, as assessed by IDC's Worldwide Semi-annual Public Cloud Services Tracker 2022 for July-December. Besides, the overall public cloud services market is expected to touch USD 17.8 billion by 2027.

All this while telcos, which provide the vital infrastructure and connectivity, have been struggling with wafer-thin ARPUs during the past few years with offerings that are losing their relevance in the new digital age. It makes sense for them to do this big pivot and jump

"5G's pervasiveness and edge computing will enable data processing closer to the source, enhancing responsiveness and reducing the load on centralised Cloud servers."

Dr Sayed Peerzade
EVP & Chief Cloud Officer, Yotta Data Services

"Telcos can provide network, bandwidth, security, software, applications on the Cloud, and even hardware as a bundled package, which can be a game changer."

Biswajeet Mahapatra
Principal Analyst, Forrester

WHY CLOUD MAKES SENSE

- Telcos can enter the cloud market to expand their revenue stream and tap the billion-dollar public cloud services market opportunity.
- Cloud services are becoming essential for enterprises, and telcos have the advantage of their existing infrastructure and customer base.
- Trends like 5G, Private LTE, Edge computing, and decentralised Clouds are reshaping the cloud landscape, offering opportunities for telcos.
- Telcos can offer bundled network, bandwidth, security, software, applications on the Cloud, and even hardware as one package at a reasonable price.

straight into the pit of the Cloud market. Let's find out how simple this ride to the Barbieland can be.

CLOUD MARKET: FROM FISSION TO FUSION

Cloud is way past the question mark stage. It has been etched as a necessity for many enterprises, and hence, is a market that is growing multi-fold. The cloud landscape, in itself, is undergoing many changes in terms of new growth pockets, new formats and new traction, all of which are worth considering for any telco eyeing this space seriously.

Biswajeet Mahapatra, Principal Analyst at Forrester weighs in on how Indian technology leaders are now openly embracing the Cloud. This is interesting as Cloud is not looked at as a cheaper alternative but as a service that drives innovation and the only way for consuming any services going forward. Zooming in on segments and verticals, he tells how MSMEs and government would be the largest consumers of Cloud going ahead. "As of now BFSI, Manufacturing, Supply chain, Hitech, Retail and healthcare remain the prominent verticals."

Trends like vertical Clouds, custom Clouds, and sovereign Clouds are refining and redefining the Cloud market, as we go forward.

"Industry cloud is very popular in China, the USA, and other parts of the world but has not seen so much traction in India. But we believe it will slowly pick up, especially as MSMEs start adopting the Cloud in a big way. Sovereign clouds will become prominent in a couple of years in India as we expect to see some major movements in this area. As data sovereignty becomes critical, sovereign clouds would be the way going forward." Mahapatra augurs.

Sudhir Kunder, Country Director, DE-CIX India adds how the adoption of multi-cloud and hybrid cloud architectures is on the rise among organisations in India. "This trend is driven by the desire to mitigate the risk of vendor lock-in, enhance operational efficiency

"Telcos are evolving to provide higher bandwidth at lower cost and services like Private LTE and edge computing, bringing centres of production closer to consumption."

Parveen Mittal
Vice President and General Manager, Celigo

and enable ease of doing business." He also echoes the optimism on sovereign Cloud when he notes how the evolving cloud landscape in India has prompted a greater emphasis on data security and compliance. "As a result, there is an emerging demand for sovereign Clouds – the Cloud infrastructure hosted and operated within the country's borders, and custom Cloud solutions tailored to specific industry needs, such as healthcare or financial services."

So, Cloud is growing in all directions, leaving enough room for telcos to sashay in. Interestingly, telcos have a home-ground advantage in many ways. This infrastructure and customer-intimacy edge can help them hit the home run easily. Or, at least, relatively easily vis-a-vis hyperscalers, especially when we evaluate the impact that 5G, Private LTE, Edge and decentralised Clouds could have on the industry.

Dr Sayed Peerzade, EVP and Chief Cloud Officer, Yotta Data Services reasons that Edge computing enabled by 5G networks, will emerge as a dominant trend, experiencing increased adoption as its versatile use cases evolve to meet the growing demands of real-time applications, IoT, and AI-driven services. In the next generation of cloud computing, 5G's pervasiveness and edge computing will enable data processing closer to the source, enhancing responsiveness and reducing the load on centralised cloud servers.

Mohit Arora, Senior Director, Strategic Sales – Commercial and Government Business, VMware points out that 5G's emergence is set to unleash a wave of higher bandwidth consumption. "This will propel an array of customer services toward the Edge, with data residing in both the Cloud and the Edge."

KEN WITH BARBIE – A KILLER COMBINATION

These forces are already creating a change, affirms Mahapatra. "These are and will have, a huge impact on cloud adoption. Along with the above adoption of IoT will also increase due to 5G which again will lead to more cloud consumption.

There are some Cloud services that telcos can offer as a distinct 'steal-the-show' advantage over the Big 3 Cloud players.

Telcos have a huge captive market that they need to farm. As the backbone of the digital revolution in India, telcos should position themselves as a one-stop shop for all the IT needs of their clients, especially focusing on MSMEs. They can provide network, bandwidth, security, software, applications on the Cloud, and even hardware if required to their clients. If all of these are bundled into one package and provided with good support and at a reasonable price, it will be a game changer, observes Mahapatra.

What's interesting here is how white boxes can break the box here. A case in point, as Kunder offers is how DE-CIX India's DirectCLOUD solution can be 'white-labelled', and one of the country's largest telecom companies is reselling it under its own brand name. "This demonstrates both the service's remarkable adaptability and the provider's ability to profit financially from their Single Access Port in a variety of ways," he explains.

Parveen Mittal, Vice President and General Manager, Celigo avers that telcos are evolving to provide not only higher bandwidth at a cheaper rate but also differentiated services like private LTE and edge computing. This brings the centres of production closer to consumption.

"Some Indian telcos including Jio and Airtel provide cloud plan services and plan to expand their capabilities. Telcos can leverage their existing infrastructure and network capabilities to complement their cloud offerings. They build and operate datacentres to host cloud services, utilise their fibre networks for high-speed connectivity between their datacentres, and offer integration between their communication services and cloud services." He

"With expertise in managing secure data transmissions, telcos can enhance the security of Cloud services and offer additional layers of protection,"

Manoj Gupta
Associate Vice President – IT, Burger King India

KEY CHALLENGES FOR TELCOS

- Telcos may face difficulties in matching the scale and capabilities of hyperscalers in the cloud market.
- Building a global presence and datacentre network like hyperscalers can be challenging for telcos in the short term.
- Cloud services require significant investment and might add financial strain, especially in a competitive, low-margin business.
- Telcos need to rethink pricing strategies and differentiate their offerings to stand out from hyperscalers.
- Establishing brand recognition and trustworthiness in the cloud market could be a hurdle for telcos.

illustrates how Indian telcos like Reliance and Airtel have established relationships with enterprises and businesses, enabling them to bundle and sell their cloud services to existing customers. In addition, Indian telcos can easily meet Data Residency laws.

Manoj Gupta, Associate Vice President – IT, Burger King India, highlights some key challenges enterprises face as a Cloud user - and whether Telco's foray in this space can help CIOs.

"Data security, protecting against cyber threats, and maintaining data privacy are the biggest and critical challenges for any cloud users. Cloud services can lead to unpredictable costs, and users need to optimise their usage to control expenses effectively. As users in the Quick Service Restaurant (QSR) industry, we place full reliance on cloud services, particularly when operating an online business. Ensuring high availability and consistent performance is of utmost importance. Any shortcomings in performance or reliability can have a profound impact on our business operations," he says.

Gupta further explains the primary operation of a QSR heavily relies on digital platforms. "We cannot afford any unexpected disruptions or fluctuations. Such incidents would directly result in significant business losses. If telcos can address the gaps faced by CIOs in the cloud market, they can potentially play a significant role in the space."

He starts by pointing out how telecom companies already have existing infrastructure, datacentres, and experience in managing networks and connectivity. "Leveraging their capabilities, telcos can offer cloud services tailored to the needs of enterprises and potentially address some of the challenges faced by CIOs."

Telcos can also provide reliable and high-performance network connectivity, ensuring seamless access to

"While adopting the same pricing and instance-usage model as hyperscalers may seem attractive, it might not always be the best strategy for telcos."

Sudhir Kunder
Country Director, DE-CIX India

cloud resources for their customers. "With expertise in managing secure data transmissions, telcos can enhance the security of Cloud services and offer additional layers of protection," he points out.

BUT, HEIMER HAS A HISTORY

Some industry players, however, still maintain that telcos cannot compete with hyperscalers in the future cloud market. As Pratik Jain, Lead Business Analyst - Digital Transformation, ACS Global Tech Solutions puts it, "Telcos and hyperscalers such as large cloud service providers like Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), and Oracle Cloud have different expertise and core businesses."

"Though both operate in the technology sector, they have distinct focus areas and capabilities. This can drastically affect telcos' ability to compete effectively in the cloud market in India," he adds.

He argues how the primary expertise of telcos lies in providing telecommunication services such as voice, data and internet connectivity. They may not have the same amount of proficiency in managing and operating large-scale cloud infrastructure and services. Hyperscalers, on the other hand, have invested heavily in building and optimising cloud platforms and that forms their core business too.

But being late does not mean being a runner-up. Nitin Singhal, Managing Director, Sinch India feels that telco cloud solutions can be easily integrated with other emerging technologies like 5G, edge computing, and IoT. This allows operators to leverage these technologies' capabilities and deliver innovative services.

Cloud services have not been a huge focus area for telcos and that is the reason for Big 3 to continue their dominance, Singhal believes. "Telcos have a huge advantage where they can offer best-in-class integrated cloud infrastructure and network and can be a compelling proposition. More investment is required by the industry to offer the same or better cloud computing, infra and network-integrated solution as compared to the Big 3."

DON'T FREEZE AT AGE 19

Yes, despite all the inherent strengths, there are many gaps that telcos have, which make it hard for them to compete with incumbent Cloud leaders. Just like how Barbie had to let go of its too-impossible size card and it started coming in three new bodies – curvy, tall, and petite, as well as seven skin tones, 22 eye colours and 24 hairstyles. Can telcos reinvent themselves as well?

Mahapatra points out that the problem with some telcos is their business model or using their datacentre capacity for other hyperscalers and not looking at building business models to target the lower segment, especially in Tier 2 and 3 cities. "That is where the volume is and that is where the next revolution will happen."

"If I articulate from QSR standpoints, telcos have to work at the global scale like the existing Cloud leaders, allowing QSRs to expand their operations internationally with ease. Here, I feel telcos may face limitations in terms of global reach, which could be a hindrance for QSRs with an international presence," Gupta shares a customer angle here.

Kunder argues how the Big 3 Cloud providers possess global datacenter networks and an extensive range of specialised services, making it essential for telcos to continually invest in expanding their service portfolios to match the cloud services providers' diversity. Also, as Jain adds, Hyperscalers offer a broad range of cloud services including Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).

Their gigantic marketplace and vast ecosystem allow customers to access a wide variety of applications, tools and services easily. Telcos might not have a similar

ecosystem and diverse service offerings. Not to forget, the global presence and multiple datacentres that hyperscalers have. Building such a global presence can be challenging for telcos, especially in the short term.

What can help a lot here is an effort in building in-house capabilities on top of the operational stack, somewhat similar to what has been attempted by Reliance Jio and Rakuten Mobile.

THE ULTIMATE FUSION

Can Bundled offerings and collaborations between telcos and technology companies create new solutions and gains for enterprises?

Telco+Tech, and not necessarily by M&A, can be by partnerships as well, and it is a sure-shot winning combination, avers Mahapatra. "In fact, many telcos already have some software in place that can help them start providing services on the Cloud to their clients," he points out.

Agrees Gupta, who says that bundled offerings and collaborations can benefit QSRs in terms of cost Saving. "It can be like a bundled package of telecommunications services with technology solutions, or with flexibility and scalability, wherein bundled offerings can be designed to be flexible and scalable."

Another factor to consider is data sovereignty. In Jain's reckoning, though data stored in the cloud is auditable and compliant with regulations, with the new Digital India Bill replacing the IT Act 2000, data sovereignty issues may arise, impacting telcos; and causing them to look after yet additional regulatory concerns if they venture into cloud services.

"By collaborating with hyperscalers, telcos can mitigate potential risks and avoid the brunt of limited business in cloud services in India. This strategic alliance allows telcos to maintain a sustainable core business, focusing on providing enhanced connectivity and retaining their customer base while leveraging the expertise of hyperscalers to offer comprehensive and compliant cloud solutions," suggests Jain.

The 'bundle' prospect might also need some rethinking on the part of telcos, including the pricing and instance-usage model used by hyperscalers.

However, Mahapatra questions this. "Why would telcos adopt the same pricing strategy? Instead, they should look at a very different method of bundling their services and price them accordingly. Having the same product and pricing strategy will never allow telcos to compete with the hyperscalers."

"While adopting the same pricing and instance-usage model as hyperscalers may seem attractive, it might not always be the best strategy for telcos. Hyperscalers like AWS, Azure, and Google Cloud operate on a massive scale, allowing them to offer aggressive pricing and flexible pay-as-you-go models. Telcos often have different business models and cost structures compared to hyperscalers. Implementing the exact pricing and instance-usage model may not align with their specific operational requirements and financial considerations," adds Kunder.

He adds that telcos can differentiate themselves by bundling services and offering tailored packages that meet the unique needs of their customers. "Also, telcos might have a stronger regional focus, serving specific markets with localised requirements. Adopting hyperscaler-like pricing might not always resonate with their target customer base."

Singhal points out that the pricing should be based on the value of the product being offered and how efficiently it solves specific problems. "There is a great scope in product innovation and for pricing as well. One model may not suit all," he says adding that adopting the same pricing and instance-usage model as used by hyperscalers is not a straightforward decision for telcos. It depends on various factors, including the nature of their business, customer base, infrastructure, and overall strategy.

Jain reminds out that Hyperscalers benefit from economies of scale allowing them to offer competitive pricing to their customers. Telcos may find it difficult to match the pricing of hyperscalers due to differences in their cost structures and revenue models.

NOT ALL POPCORN YET

Overall, telcos should think out of the box, look at creating new bundled services, look at the possibilities of sovereign Clouds and focus on MSMEs and the government sector, suggests Mahapatra. "This is going to be the future, rather than emulating hyperscalers and having a reseller mindset."

Telcos should focus on building brand recognition and market reach, suggests Kunder. By promoting

their unique offerings and the value they bring to customers through personalised and integrated Cloud solutions, they can effectively compete with leading Cloud providers.

Kunder gives an instance. "DE-CIX's Microsoft Azure Peering Services enables businesses to optimise connectivity to Microsoft's Cloud services, ensuring robust and stable access to Azure resources. This collaboration enhances enterprises' cloud experience and opens up new possibilities for cloud-based applications and services. By bundling Telco services with technology offerings, enterprises can achieve enhanced efficiency, reliability, and tailored solutions, leading to a competitive advantage in their respective markets."

Recently, Jio and Microsoft unveiled a strategic partnership in which Jio will undertake the construction of datacenters across India, all to be hosted on the Microsoft Azure platform. Additionally, as part of the company's network-function virtualisation endeavours, Microsoft Azure will be integrated into Jio's connectivity infrastructure, cites Jain.

"Let's not forget that Cloud services is a very capital-intensive and low-margin business, especially in the initial years," underlines Mittal. "While segregated financials of global public cloud providers are not available, most vendors are considered to be making losses today. Indian telcos are going through a tough economic and regulatory environment with already stretched financials. So, they need to be cognizant of the demand on resources that public Cloud business will make."

Catching up to the scale and capabilities of hyperscalers would require significant investment and time for telcos assuming that a major chunk of investments today has already been made in the 5G rollouts by them, Jain reasons. "Hyperscalers continuously invest in R&D to improve their cloud offerings and introduce cutting-edge technologies. Innovation is crucial in the highly competitive cloud market and telcos might find it challenging to match the pace of innovation set by hyperscalers," he highlights.

Also, customers often choose cloud providers based on their reputation and reliability. Telcos may not have the same level of brand recognition or trustworthiness in the cloud market.

Well, as attractive and plausible as the land of Cloud looks, telcos will have to rethink a lot of assumptions and comfort zones, if they want to strike a Barbieheimer. Lest someone else catches up.

Because, amidst all the Barbieheimer buzz, there was also a Tom Cruise, still falling off cliffs and running on fast trains – fighting AI and more. Some old and bold tricks never fail. And you never know who your industry's Tom Cruise is.

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"SMBs HAVE NOW STARTED TO EMBRACE CLOUD SERVICES"

NITIN SINGHAL
Managing Director,
Sinch India

India, like the rest of the world, is seeing a massive uptake of various flavours of Cloud. How disruptive is the trend for variants like vertical, custom, and sovereign Cloud?

India's uptake of various Cloud flavours like vertical, custom, and sovereign Cloud is highly disruptive. These trends are driven by the demand for data localisation and industry-specific solutions.

The success of these variants depends on how well Cloud providers can address the specific needs and demands of different industry verticals. Enterprises are realising that focusing on core competencies and adopting advanced Cloud solutions is preferable to developing or buying costly technologies. As technology rapidly evolves, service providers investing in R&D can offer new-age Cloud solutions, benefiting enterprises through a commercial Cloud service model. The future of Cloud computing is likely to be shaped by these disruptive trends, impacting various sectors and business models.

What about 5G, Private LTE, Edge, and decentralised Clouds? Will these forces also bring about significant change?

Technologies like 5G, Private LTE, Edge, and decentralised Clouds are expected to bring about significant changes in the industry. Decentralised Cloud and blockchain are becoming essential for enterprises to secure their applications, data, privacy, security, and accessibility controls.

LTE technologies make it possible for service providers to offer low-latency private cellular networks low-latency private cellular networks. Edge computing allows data processing and storage to be closer to the end user, reducing the need to transfer large amounts of data to central Cloud servers. This facilitates real-time processing and response, enabling time-sensitive Cloud applications like IoT and autonomous vehicles.

While these technologies are already showing promise, the industry is still in its early stages, and widespread use case adoption may take some time.

In the changing scenario, what advantages can telcos offer with their Cloud offerings? Are there any gaps that telcos should worry about?

Telco Cloud solutions provide seamless integration with emerging technologies like 5G, Edge computing, and IoT, enabling operators to deliver innovative services with enhanced capabilities.

> Decentralised Cloud and blockchain are becoming essential for enterprises to secure their applications, data, privacy, security, and accessibility controls.

However, Cloud services have not been a primary focus for telcos, leading to the continued dominance of the Big 3 Cloud players. While telcos have the advantage of offering integrated Cloud infrastructure and network services, there is a need for significant investment in the industry to match or surpass the offerings of the Big 3 in terms of Cloud computing, infrastructure, and network integration. Closing this gap is crucial for telcos to establish a compelling proposition in the Cloud market.

Can bundled offerings and collaborations between telcos and technology companies create new solutions and gains for enterprises?

Yes, as enterprises increasingly recognise the significance of single Cloud to multi-Cloud or native Cloud applications for supporting and scaling their businesses, the collaboration between telcos and tech stack providers to offer enhanced Cloud infrastructure will undoubtedly be a welcome move.

In that case, should telco Cloud players consider adopting the same pricing and instance-usage model as used by hyperscalers?

Pricing should be based on the product value being offered and how efficiently it solves specific problems. There is a great scope for product innovation and pricing as well. One model may not suit all. Adopting the same pricing and instance-usage model as used by hyperscalers such as Amazon Web Services, Microsoft Azure, and Google Cloud Platform is not a straightforward decision for telco players. It depends on various factors, including the nature of their business, customer base, infrastructure, and overall strategy.

Having said that, it is also important to note that the pricing models of hyperscalers are well-established and widely understood in the Cloud computing industry. Adopting similar models could make it easier for customers to understand and compare services across different providers. Also, emulating the pricing strategies of successful hyperscalers might help telcos remain competitive in the market, especially if customers are already accustomed to and prefer this pricing approach.

The flip side is that telcos may face challenges due to differing infrastructure costs and business models. Hence, implementing this pricing model without adjustments may not be feasible or profitable for them. Additionally, specific regulations governing telecom services in different regions and countries can impact the structuring of pricing models. Transitioning to a new pricing model can be complex, especially if existing contracts and billing systems are incompatible with the hyperscaler approach.

In summary, while there are benefits to considering hyperscaler pricing and instance-usage models, telcos must carefully evaluate their unique circumstances, customer base, and long-term objectives. Some elements of hyperscaler pricing models may be adaptable and beneficial, but a full-scale adoption would require meticulous planning and consideration of the specific dynamics within the telco industry.

To sum it up, what key changes strike you the most across sectors in India's growing Cloud market?

The Cloud market in India has witnessed significant changes. Firstly, the CPaaS or Communication-Platform-as-a-Service market has experienced consolidation, as players unite to enhance operational efficiency and expand their market presence. Secondly, leading CPaaS players, with robust infrastructure and scaling capabilities, are exploring international markets for growth beyond India. Additionally, the industry has taken proactive steps against fraud and phishing messaging, deploying solutions on both enterprise and telco fronts to ensure security and user protection.

Furthermore, large enterprises are increasingly confident in adopting cloud services for communication strategies, and industry-specific clouds tailored to specific verticals have emerged. While startups have a proven record, SMBs have now started to embrace cloud services for various business processes, support, and marketing. Additionally, there has been a surge in transactional messages, fuelled by UPI, mobile banking transactions, and Two-Factor Authentication (2FA) messages.

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"CLOUD-BASED SOLUTIONS STREAMLINE OPERATIONS"

SATHESH MURTHY
Managing Director and Engineering Head,
RingCentral India

What has been the impact of Cloud technology on the traditional telecom sector in India?

The combination of cloud technology and the telecom sector in India has the potential to drive innovation, improve efficiency, and provide better services to customers while enabling the growth of other industries through enhanced connectivity and communication capabilities. By virtualising network infrastructure through SDN and NFV, operators gain flexibility, scalability, and cost-effectiveness.

Cloud-based solutions streamline operations, optimise resource usage, and reduce capital expenses with a pay-as-you-go model. Cloud technology opens up opportunities for partnerships and collaborations between telecom operators and cloud service providers. This synergy allows telecom companies to leverage the expertise and offerings of cloud providers to enhance their services and expand their market reach.

What impact would 5G, Pvt LTE, Edge, and decentralised Clouds have on the industry? Are these forces already creating a change?

The combination of 5G, Private LTE, Edge computing, and decentralised clouds has the potential to bring about significant changes in the industry and drive transformative shifts in how businesses and consumers use and experience technology. These technologies collectively pave the way for new applications, services, and business models that were not feasible before.

Industries like healthcare, transportation, manufacturing, and entertainment are already experiencing significant transformations due to these technologies. There is a shift towards more edge-based and distributed architectures to handle the growing volume of data and the need for real-time processing. Companies are investing heavily in upgrading their infrastructure to leverage the advantages of these technologies and stay competitive. By and large, the combination of 5G, private LTE, edge computing, and decentralised clouds creates a foundation for future innovations like smart cities, connected vehicles, IoT solutions, and advanced industrial automation.

Can Bundled offerings and collaborations of telcos and techcos create new solutions and gains in the enterprise communication space?

Bundled offerings and collaborations between telcos and technology providers have the potential to create new solutions and generate significant gains in the enterprise

> Together 5G, private LTE, edge computing, and decentralized cloud create a foundation for innovations like connected vehicles, IoT solutions, and industrial automation.

communications space. These partnerships allow for the integration of telecom services with advanced technologies, resulting in innovative and comprehensive communications solutions tailored for businesses.

Bundled offerings can combine various communication services such as voice, video conferencing, instant messaging, and collaboration tools into a unified platform. This streamlines communication for enterprises, making it easier for employees to connect and collaborate seamlessly. By collaborating with technology providers, telcos can leverage their expertise to enhance connectivity options for enterprises. This includes offering high-speed internet, private networks, and secure connections for businesses with specific communication needs. By integrating communication services with advanced analytics capabilities, enterprises can gain valuable insights into their communication patterns and use data to improve decision-making and customer service.

Overall, bundled offerings and collaborations between telcos and tech providers create synergies that lead to tailored and comprehensive communication solutions for enterprises. As the communication needs of businesses continue to evolve, these partnerships are likely to play a crucial role in meeting the demands of a digital and interconnected world.

What does RingCentral bring to the table in India?

We have a lot of opportunities with the adoption of cloud-based communications technologies given the changing working dynamics in India. We want to strive for excellence in research and development, fostering innovation across the board. RingCentral offers a connected experience across modalities on a single global open platform with more than 500 APIs, over 8,500 custom apps, and more than 80,000 developers. RingCentral provides industry-leading products for UCaaS and CCaaS.

We introduced RingSense, a cutting-edge AI technology that enables conversation intelligence in business communications and collaboration, earlier this year. Furthermore, India has a wealth of talent, and we are building our engineering organisation as we scale for growth, transforming our innovation centers in India into centers of excellence and a significant R&D hub. There are already 200 employees in India, and we intend to double that number over the course of the next 12 months.

RingCentral has recently got approval to provide cloud telephony in India. How does it impact the enterprise communication market in India?

We see huge market opportunities in India. Gartner estimates IT communications services spending in India to reach USD 24.7 billion in 2023. As more global corporations turn to India to grow satellite offices and develop technology hubs, they need fully compliant, enterprise-grade solutions to ensure business continuity and seamless communications. Our goal is to be everywhere our customers are. RingCentral is currently available in over 45 countries and supports 18 languages. We have just added India to the countries we support so multinational organisations with a presence in India can leverage our cloud solutions.

What is the company's plan for future expansion and growth in India?

We have a multi-fold growth and expansion in India. RingCentral recently got approval from DoT and TRAI to offer enterprise-grade cloud telephony in India. This cloud-based phone system can be utilised with desk phones, desktop apps, and mobile apps, facilitating the management of the phone system across branch offices worldwide. We have now added India to the countries we support so multinational organisations with a presence in India can leverage our cloud solutions.

We are also constantly trying to find new partners with whom we can work to improve the services we provide to our clients. RingCentral has a sizable partner ecosystem that includes, some of the biggest phone providers in the world, such as AT&T, Vodafone, BT, and Deutsche Telekom. Additionally, we are continuing to invest and grow our engineering organisation in India. We recently opened our first RingCentral India office in Bengaluru. India has a deep talent pool, and we will tap into that to build our innovation center in India.

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[GUEST COLUMN]
CLOUD

The new productivity game-changer

Evolving technology and market demands are fuelling Cloud adoption in India, empowering businesses with enhanced productivity, growth, and efficiency

BY DR YOGESH SHETE

The cloud market in India is experiencing rapid growth, projected to have a CAGR of 23.4% from 2022 to 2027. This expansion is primarily fueled by factors such as the widespread adoption of cloud-based services by businesses of all sizes, improved internet connectivity, and the government's emphasis on digital transformation.

A close look at the changing technology trends and one can observe three major changes in the cloud market in recent years. One, there is a shift from on-premises to cloud-based deployments; two, the adoption of hybrid cloud solutions is on the rise; and three, there is a growing demand for specialised Cloud services, such as artificial intelligence (AI) and machine learning (ML).

Shift from on-premises to Cloud-based deployments: Businesses are increasingly opting for cloud-based deployments due to the cost savings and flexibility offered by cloud computing. By embracing the cloud, companies can save on hardware and software costs,

> A NASSCOM report predicts that the number of MSMEs using cloud computing in India will increase from 10 million in 2021 to 15 million by 2025.

INDIA STATS & TRENDS

- The cloud market in India is witnessing rapid growth, with a projected CAGR of 23.4% from 2022 to 2027.
- Businesses are increasingly moving from on-premises to cloud-based deployments due to cost savings and flexibility offered by cloud computing.
- Hybrid cloud solutions are gaining popularity as businesses seek to combine on-premises and cloud-based resources.
- The adoption of AI and ML technologies is driving the demand for specialised cloud services with significant computing power and storage capacity.
- Edge computing is gaining popularity as businesses seek to improve performance and reduce latency for cloud-based applications.
- Industries like manufacturing, healthcare, financial services, retail, and e-commerce are experiencing substantial demand for cloud services.

while also being able to scale their cloud resources as required. This shift has become a preferred choice for many organisations seeking enhanced efficiency and reduced IT overheads.

Adoption of hybrid Cloud solutions: The surge in hybrid cloud solutions adoption addresses the need for businesses to leverage both on-premises and cloud-based resources. This becomes especially crucial for enterprises that must comply with data sovereignty regulations, ensuring sensitive data remains on-premises while benefiting from cloud scalability for other operations. Hybrid cloud solutions provide the best of both worlds, empowering companies to maintain control over critical data while leveraging cloud services for other applications.

Growing demand for specialised Cloud services: The increasing adoption of AI and ML technologies is driving the demand for specialised cloud services that can provide the required computing power and storage capacity. These advanced technologies demand substantial resources that might be challenging to provision on-premises. Cloud-based solutions offer a cost-effective and scalable approach to cater to the demands of AI and ML applications.

CLOUD MARKET IN INDIA

In addition to these three main changes, several other trends are emerging in the cloud market in India.

Growth of the MSME Segment: The Government of India is actively promoted cloud-based solutions for Micro, Small, and Medium Enterprises (MSMEs). Initiatives such as the Startup India program, which provides cloud credits to MSMEs, have significantly contributed to the adoption of cloud computing. A recent NASSCOM report predicts that the number of MSMEs using cloud computing in India will increase from 10 million in 2021 to 15 million by 2025. Leading cloud service providers like Google Cloud have responded by offering tailored solutions specifically designed to meet the needs of MSMEs.

Government's adoption of Cloud-based solutions: The Indian government has recognised the potential of cloud-based solutions in delivering efficient and accessible public services. Cloud applications have been employed to offer e-governance services, such as online tax filing and e-health records, thereby enhancing citizen experiences. EY's report suggests that the government's

> Specific industries such as healthcare, manufacturing, and financial services are adopting cloud-based solutions tailored to their unique requirements.

spending on cloud computing is expected to reach USD 5 billion by 2025, reflecting the significant commitment towards modernising government IT systems. Cloud giants like Amazon Web Services have also introduced cloud solutions tailored for the government sector.

Vertical cloud market growth: Businesses in specific industries are increasingly embracing cloud-based solutions to cater to their unique requirements. For example, the healthcare industry is leveraging cloud computing to improve patient care, reduce costs, and manage critical patient data securely. IDC projects the vertical cloud market in India to grow from USD 1.5 billion in 2021 to USD 3 billion by 2025. Leading cloud providers like Microsoft Azure have introduced specialised cloud services designed for vertical industries like healthcare.

Increasing adoption of Edge Computing: Edge computing is witnessing a surge in popularity as businesses seek to enhance the performance and reduce the latency of their cloud-based applications. By bringing cloud resources closer to the end users, edge computing optimises data processing and delivery, particularly for users in remote areas. Gartner's report indicates that the global edge computing market is expected to grow from USD 3.3 billion in 2021 to USD 12.5 billion by 2025. Cloud service providers like Amazon Web Services have introduced edge computing solutions to improve the performance and responsiveness of cloud applications

VERTICALS WITH HOT DEMAND

In addition to the general trends mentioned above, several verticals and segments in India are witnessing a surge in demand for cloud services.

Manufacturing: Companies in the manufacturing sector in India are adopting cloud solutions to streamline production processes, automate operations, and reduce costs. Cloud-based systems enable efficient collaboration among stakeholders, resulting in increased productivity and improved supply chain management.

Healthcare: The healthcare industry is leveraging cloud-based solutions to improve the delivery of care, manage patient data securely, and adhere to strict regulatory requirements. Cloud platforms enable seamless data sharing among healthcare providers, leading to better patient outcomes.

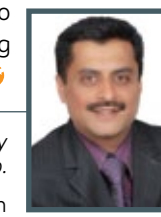
Financial Services: Financial institutions are turning to cloud solutions to enhance risk management practices, automate trading operations, and deliver superior customer service. Cloud-based platforms offer the computational power needed for real-time data analysis and facilitate seamless customer interactions.

Retail: The retail sector is utilising cloud services to enhance customer experiences, optimise inventory management, and deliver personalised marketing campaigns. Cloud-based retail solutions help retailers gain insights into customer preferences, enabling them to tailor their offerings effectively.

E-commerce: Online businesses are scaling their operations with cloud-based solutions, improving customer service, and safeguarding customer data. Cloud platforms provide the required infrastructure for handling fluctuating demands during peak seasons while ensuring data security.

The cloud market in India is experiencing remarkable growth, driven by factors such as the shift from on-premises to cloud-based deployments, the adoption of hybrid cloud solutions, and the growing demand for specialised cloud services. Additionally, several verticals and segments, including manufacturing, healthcare, financial services, retail, and e-commerce, are witnessing significant demand for cloud-based solutions.

As technology continues to evolve, the cloud market in India is expected to further expand, presenting even more opportunities for businesses to leverage the power of cloud computing for enhanced productivity and growth.



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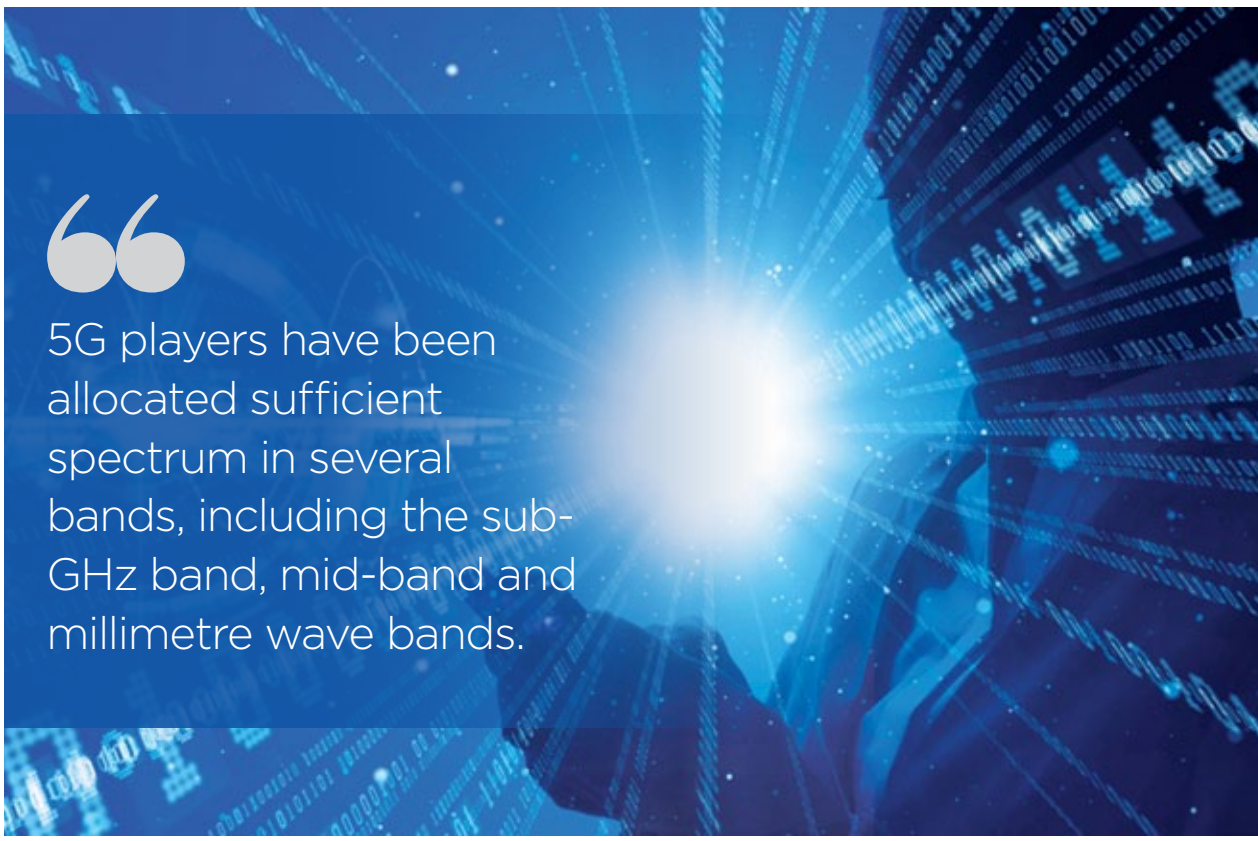
TV RAMACHANDRAN

IT'S TIME TO RESOLVE THE SPECTRUM CONUNDRUM

India needs a balanced policy that can protect the spectrum rights of the incumbent broadcasting sector and also accommodate the 5G players

Price sensitivity is a critical characteristic of Indian consumers, making the affordability of communication media crucial in the field of information and broadcasting. Undoubtedly, broadcasting serves as a highly cost-effective and reliable source of entertainment, information, and knowledge for the masses. Moreover, it plays a significant role in expanding the reach of education and awareness to rural, remote, and economically disadvantaged citizens. Governments also utilise broadcasting for public welfare and promoting socioeconomic development. Hence, it merits considerable importance in the communication landscape.

The Cable and Satellite (C&S) sector holds significant importance for the nation as it caters to communication and entertainment services for 207 million TV households, including both rural and urban areas. With nearly 900 registered TV channels transmitted through satellites using the C-Band radio spectrum (4-8 GHz)



> The extended C band and the upper Ku band have traditionally been used by broadcasters and MSOs to offer cable and satellite services in India.

BROADCASTING SPECTRUM BANDS		
Spectrum Band	Frequency Band	Quantum of Spectrum
UHF/VHF Band –Terrestrial	470-582 MHz	112 Mhz
Extended VHF band –Terrestrial	582-612 Mhz	30 Mhz
Extended C band	3700-4200 MHz	500 MHz
Lower Ku Band	12.2-12.7 Ghz	500 Mhz
Lower Ka bands	(i) 18.3-18.8 Ghz	500 Mhz
	(ii) 19.7-20.2 Ghz	500 Mhz
Total Spectrum		2142 Mhz (2.142 GHz)

and Ku Band (11-13 GHz), the sector is served by 1,701 registered distribution platform operators (DPOs) across India.

Notably, the sector also provides direct and indirect employment to nearly two million people. The per capita media consumption through television has grown at a 7% CAGR from 2020 to 2022 and is projected to grow at an even faster rate in the future. Given these figures, the significance of nurturing and fostering the sector cannot be overstated.

THE BIG SPECTRUM DEBATE

The radio spectrum is universally acknowledged as a finite natural resource that serves as the backbone of all wireless communications, including satellite-based communications and broadcasting. With the exponential rise of new applications and services in both broadcasting and communications, there is an increasing demand for additional spectrum allocation. To ensure the healthy growth of the sector, a balanced spectrum policy that is forward-looking, sustainable, and harmonious, while safeguarding the legitimate rights of incumbents, holds utmost significance.

To achieve an optimal spectrum policy that balances the interests of incumbent broadcast users and caters to the future needs of other services desiring to utilise the same spectrum band, it is crucial to consider the recommendations of international regulatory and standards bodies. Additionally, assessing the spectrum availability in the country and the potential for co-existence between new and incumbent services is essential. Aligning India's stance on a particular spectrum band with global trends and best practices is also necessary for a well-rounded approach.

The emergence of advanced mobile services in spectrum bands presently utilised by incumbent broadcasters, specifically the extended C and Ku bands, has sparked intense debate over the competing use of spectrum by two different but essential segments: Satellite and Broadcasting, versus the new 'kids on the block', the 5G players in the mobile telecommunications sector. Various strategies, such as splitting the band or proposing mixed-use of the spectrum, are being suggested to accommodate both sets of players. However, these proposals come with significant adverse implications and compromise the status of each segment.

> The Out of Band Emissions (OBE) from the 5G transmitters can interfere with the incumbent satellite broadcasting signals, both in the C and Ku bands.

IN SHORT

- The broadcasting sector is crucial for providing affordable communication and entertainment to Indian consumers.
- The Cable and Satellite sector plays a significant role in reaching TV households in rural and urban areas.
- Protecting the extended C band and Ku Band is vital to prevent interference and ensure quality of service.
- The decision to auction the C-band and the Ku Band spectrum used by broadcasting, can impact the broadcasting sector severely.
- A sustainable spectrum policy, based on ITU-led Radio Regulations, should consider the rights of existing players and the public good.

The table Broadcasting Spectrum Bands illustrates the frequency-wise status of the spectrum band.

STATUS QUO IS THE SOLUTION

The extended C band, spanning from 3.67 to 4.2 GHz, and the upper Ku band (12.2-12.7 GHz), have traditionally been, and continue to be utilised by broadcasters and MSOs to offer cable and satellite services in India as well as across the world. This practice is not only aligned with the guidelines of the global apex body ITU, it is in conformance with India's National Frequency Allocation Plan (NFAP) for over two decades.

If this extended C band and the Ku band were to be left exclusively for the broadcasters as they were today, both services could flourish and grow healthily without any difficulty. The current arrangement includes a separation or guard band of more than 30 MHz between the two services. This ensures that there is no interference between the 5G services in the lower C band and the broadcast services in the upper part of the C band.

Such interference prevention is vital as any disruption between frequencies of different technologies, like satellite broadcasting and terrestrial in this case, would directly harm the quality of service for customers relying on the incumbent satellite broadcasting service. This scenario would lead to an unacceptable conflict, violating the fundamental principles of radio regulations, which aim to provide full protection to incumbents while encouraging the introduction of new services. Additionally, such an approach would not guarantee an interference-free spectrum, which could harm the customers and business interests of the new licensees.

Given the socioeconomic importance of the broadcasting sector, the operations in the extended C band and the Ku Band should be fully protected by preventing any interference in this part of the band from any new services. The ongoing advocacy to claim the use of extended C band and Ku Band for 5G, has caused much concern and dismay in the C&S sector. The genuine concern is that the inevitable Out of Band Emissions (OBE) from the 5G transmitters would interfere with the

incumbent satellite broadcasting signals, both in the C and Ku bands.

TIME FOR A BALANCED APPROACH

5G mobile services are also undoubtedly important for economic growth and development and we need to ensure that adequate spectrum resources are made available for the concerned new players. However, it would be unfair and incorrect to evict existing occupants forcibly and give it to new entrants who have a plethora of other options and are having only 30% of the identified 5G spectrum assigned to them. As against this, broadcasting is already working with 75% of the spectrum identified by ITU for them.

It should be noted that 5G players have been allocated sufficient spectrum in several bands, including the sub-GHz band, mid-band and millimetre wave bands. In fact, ITU (WRC-19) has identified a substantial 12.25 GHz spectrum for 5G use, which is 600% or six times more than the spectrum available for broadcasting. Furthermore, India has already allotted as much as 3.77 GHz for 5G, which is 75% higher than what is made available for broadcasting. This allocation encompasses all bands, including the mid-bands and millimetric wave bands, making a compelling case for not reducing the extended C band (3.67-4.2 GHz) and Ku Band in favour of the crucial broadcasting sector.

A sustainable spectrum policy resolution should be sought, ideally based on ITU-led Radio Regulations that emphasise providing full protection to incumbent users while accommodating new ones. The new policy must strike the right balance between equity and respect for the rights of existing players while embracing progress through the adoption of new technologies. It is essential to avoid any disruptions or disturbances to the existing legal occupants of the spectrum band and their customers.

If the government proceeds with its decision to auction the C-band and the Ku Band spectrum used by broadcasting, experts warn of a potentially serious setback to the sector. It is worth noting that the country's apex court upheld, in its advisory jurisdiction regarding the order in the 2G case, that "Auction, as a method of disposal of natural resources, cannot be declared a Constitutional mandate under Article 14 of the Constitution of India." The Supreme Court further emphasised that "Auction may maximise revenue, but it may not always be the best way to serve the public good."

Broadcasting serves as an affordable public utility for the masses, and they could collectively voice their concerns to convince policymakers and shape public opinion against the move. Broadcasting stands as the most accessible and popular medium for millions of Indians and forms the backbone of the promising Indian M&E industry.

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

Views are personal.

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[COMMENTARY]
SKILL DEVELOPMENT

A key to unlocking the true potential of 5G

With India's young population and a large pool of technology talent, the country has the potential to become the world's cradle for 5G skills

BY SAURABH KUMAR SAHU

Today, it is widely established that 5G, as a disruptive technology, will reshape the entire communications value chain. It is expected to play a crucial role in the total enterprise reinvention journey of every modern enterprise, enabling cloud-based infrastructure, advanced data, and Artificial Intelligence (AI) capabilities, as well as applications and platforms.

In India, business leaders are notably enthusiastic about the potential of 5G and its ability to streamline operations and enhance productivity. These advancements will be particularly essential to keep pace with an increasingly complex and dynamic business landscape that necessitates seamless integration and intelligent digital networks capable of real-time communication to swiftly address customer

> As India embarks on its 5G-led transformation journey, it is critical to bridge the skills gap and ensure the availability of an industry-ready workforce.

> 5G will require broader skill sets and businesses need to think about how to bring together a wide range of services and vendors to build their 5G capabilities.

IN SUMMARY

- 5G is set to revolutionise the communications value chain, enabling cloud-based infrastructure, AI, and real-time applications.
- Despite the excitement, there's a significant shortage of skilled professionals to manage 5G applications effectively.
- Reports highlight a demand of 1.5 lakh roles in 5G, Cloud, AI, IoT, and more, with a widening skills gap of nearly 28%.
- To address this, India needs to prioritise 5G skills development through updated academic curricula, corporate upskilling, and collaboration between industries and academia, with government support.
- 5G skills are crucial for India's digital growth, and bridging the gap can lead to job opportunities and sustainable development while positioning India as a leader in global 5G skills.

needs. In essence, the future of business, and consequently the future of our digital economy, is heavily reliant on the widespread adoption of 5G.

While there is extensive discussion around 5G and its potential applications, an overlooked aspect is the availability of skilled professionals who are capable of comprehending and managing these applications. For example, if a large FMCG company decides to use 5G to improve its manufacturing processes, who will possess the necessary expertise to operate it once the initial deployment by the partner or a telecom operator is complete?

The fact is that 5G technologies are evolving at a faster rate than the skills required to effectively harness its capabilities. To illustrate this point, James Cameron created the concept and acquired the necessary skills a decade before he launched his film Avatar, as he awaited the advancement of technology to catch up. Conversely, the technology already exists in the case of 5G, but the skills required to tap into its true potential are currently missing.

A report by TSSC highlights a demand of over 1.5 lakhs in roles in 5G, Cloud Computing, AI and Big Data analytics, the Internet of Things (IoT), mobile app-development, and robotic process automation. The demand-supply gap pegged at nearly 28% is estimated to continue to widen. 5G will require broader skill sets and businesses will also need to think about how to bring together a wide range of services and vendors to build their 5G skills capabilities including global telcos, cloud and edge platform providers, IoT specialists, and device and application vendors, system integrators, operations outsourcers, and strategy and transformation advisory experts.

It is expected that 5G services will create millions of new jobs not just for the telecom

> Telecom operators can contribute by collaborating with educational institutes to develop specialised 5G training programs and curriculum modules.

industry, but in other areas like data analytics, human-computer interaction, and varied industries of healthcare, retail, energy, and education. With India's young population and a large pool of technology talent, we have the potential to become the world's cradle for 5G skills, creating numerous job opportunities and fuelling the country's digital growth- but for that, we must get skilling right.

BUILDING A 5G SKILLS ADVANTAGE

Organisations and the larger tech ecosystem must prioritise initiatives to develop a workforce skilled in 5G and its related technologies across industries. However, this can only happen when there is a concerted effort across the ecosystem. Here are some of the ways how this can be done.

#1

Updated academic curriculum: Just as computer science and artificial intelligence have become integral parts of India's STEM academic curricula, updating educational programs to include 5G skills will equip students with a thorough understanding of the technology and its potential, so they can effectively contribute to future 5G-powered industries.

#2

Corporate upskilling and intervention: 5G is expected to have applications in almost every industry. It is no longer the bastion of tech or telco or hyperscalers, and organisations across sectors will need to take proactive steps to integrate 5G skills into their learning and development programs. For example, the logistics and shipping industry can make use of smart 5G technology for goods tracking, fleet management, centralised database management, staff scheduling, and real-time delivery tracking and reporting.

The people working on these use cases need to know how to run them, and what their limitations might be. To maintain these platforms, companies will need user interface experts and technicians. They need the capabilities to explore new use cases made possible by 5G connectivity and will require additional investments in research and development to open doors to new business opportunities and innovative products and services.

#3

Industry academia collaboration and continued government support: To overcome the skills gap and drive the skilling agenda forward, collaborative partnerships between telecom operators, educational institutes, enterprises, and the government are vital. By working together, these stakeholders can develop a skilled workforce that meets the demands of India's 5G-propelled digital future.

Telecom operators can contribute by collaborating with educational institutes to develop specialised 5G training programs and curriculum modules with their domain knowledge and infrastructure. As evidenced by programs such as Skill India, which will include various areas of skilling related to 5G, the government has already begun discussions on the subject.

Moreover, as organisations prioritise net zero goals, those that embrace 5G skills will be able to drive sustainable growth in the digital era. 5G technology has the potential to significantly reduce energy demand and carbon emissions - yet another reason for organisations to prioritise the adoption of 5G skills to achieve the goal of total enterprise reinvention, driven by a strong digital core.

Overall, the transformative potential of 5G is expected to reshape industries by driving efficiency, innovation, and sustainability. As India embarks on its 5G-led transformation journey, it is critical to bridge the skills gap and ensure the availability of an industry-ready workforce. India's large population and world-class technological advancements have the potential to place it at the forefront of global 5G skills, giving the country's businesses and economy a significant digital advantage.

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Get more juice from your mobile advertising budget

Optimising the mobile advertising budget for maximum ROI requires a strategic and data-driven approach, including defining clear objectives

BY SUNDEEP RANA

Mobile advertising holds paramount significance in contemporary marketing strategies as mobile devices have seamlessly integrated into the lives of Indian consumers. It has become imperative for businesses to develop robust mobile marketing strategies due to the substantial traffic generated through mobile phones. However, while adopting digital strategies for mobiles, it is essential to identify and incorporate crucial marketing components that resonate with users' mobile experiences, leading to enhanced engagement and brand loyalty.

Mobile marketing has emerged as a game-changer in the digital landscape. With the widespread use of smartphones and the exponential growth of mobile internet users in India, businesses must recognize the immense potential that mobile advertising offers. It has

> Mobile advertising requires a distinct and tailored approach, considering the unique user behaviour and limited screen real estate of mobile devices.

transformed the way brands communicate with their target audience, enabling personalized and location-based targeting that was previously unimaginable.

One common misconception about mobile advertising is that it is merely a downscaled version of desktop advertising. In reality, it requires a distinct and tailored approach, considering the unique user behaviour and limited screen real estate of mobile devices. Brands that adapt their advertising strategies to suit mobile platforms effectively can tap into a vast pool of potential customers and gain a competitive edge.

Another prevalent misunderstanding is that mobile advertising is intrusive and bothersome to users. While poorly executed mobile ads can indeed be intrusive, a well-crafted and relevant advertisement can capture the attention of users without being disruptive. The key lies in understanding the preferences and interests of the target audience and delivering ads that add value to their mobile experience.

To achieve the maximum return on investment (ROI) from mobile advertising budgets, organizations must optimize their campaigns effectively. The mobile app market has matured, and users are now eager to maximize the benefits of mobile marketing. No wonder then, creating an effective mobile marketing strategy requires careful consideration of several key elements.

1
DEFINE CLEAR ADVERTISING OBJECTIVES

Defining clear advertising objectives is the foundational step before allocating a budget. It is crucial to establish Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) goals that align with the overall marketing strategy. Whether the objective is to increase brand awareness, drive website traffic, or generate conversions, having well-defined goals will guide budget optimization efforts.

2
CONDUCT IN-DEPTH TARGET AUDIENCE RESEARCH

To optimise the mobile advertising budget effectively, it's vital to understand one's target audience inside out. Thorough market research is necessary to identify the demographics, interests, behaviours, and preferences of the ideal customers. Armed with this data, businesses can create highly targeted and relevant mobile ad campaigns, reducing wasted ad spending on irrelevant audiences.

3
UTILISE DATA ANALYTICS AND TRACKING

The power of data analytics and tracking can be leveraged to gain insights into the performance of mobile ad campaigns. Tracking tools such as Google Analytics, mobile app analytics, or third-party ad tracking platforms can be utilised to monitor key metrics like impressions, click-through rates (CTRs), conversions, and cost per acquisition (CPA). Analysing this data will enable the identification of high-performing campaigns and help make informed decisions on budget allocation.

#4
TEST MULTIPLE AD FORMATS

Mobile advertising offers various ad formats such as banner ads, interstitial ads, video ads, and native ads. To optimise the budget, businesses should test various ad formats to determine which ones yield the best results. Monitoring engagement rates, conversion rates, and user feedback can help identify the most effective ad formats for the target audience. Allocating a larger portion of the budget to the top-performing ad formats will help maximise the ROI.

5
USE LOCATION-BASED MARKETING

Location-based marketing is a potent technique to target users based on their geographic location. It enables businesses to reach users according to their physical location, allowing them to target specific regions, cities, or even proximity to their business locations. By implementing geolocation targeting, businesses can optimise their budget by focusing the ad spend on areas where their target audience is most likely to convert. This helps reduce wasted impressions on users who are unlikely to engage with the ads.

6

LEVERAGE PROGRAMMATIC ADVERTISING

Programmatic advertising is another crucial aspect of mobile marketing. Programmatic advertising automates the buying and selling of ad inventory, utilising data and algorithms to optimise ad placements in real time. It helps optimise the mobile advertising budget by targeting the most relevant audience segments and adjusting bids based on performance data. Programmatic advertising ensures that the budget is allocated to the most valuable ad impressions, increasing the likelihood of achieving a higher ROI.

MOBILE AD ESSENTIALS

- Define clear advertising objectives aligned with the overall marketing strategy to guide budget optimization efforts.
- Conduct in-depth target audience research to create highly targeted and relevant mobile ad campaigns.
- Utilize data analytics and tracking to monitor key metrics and make informed decisions on budget allocation.
- Test multiple ad formats to identify the most effective ones and maximize ROI.
- Use location-based marketing to target users based on their geographic location and reduce wasted ad spend.

#7

FOCUS ON MOBILE-FRIENDLY CONTENT

Mobile-friendly content is essential to provide a seamless browsing experience on mobile devices. Creating content with shorter paragraphs, bullet points, clear headings, and optimized images and videos enhances mobile viewing and user engagement.

8

MONITOR AND OPTIMISE CAMPAIGNS CONTINUOUSLY

Continuous monitoring and optimization of campaigns are necessary for success in mobile advertising. Regularly tracking the performance of mobile ad campaigns and making data-driven adjustments help identify underperforming campaigns or ad placements. By reallocating the budget to top-performing ones and implementing A/B testing to optimize ad creatives, messaging, and CTAs, businesses can steadily improve their ROI over time.

Optimizing the website to provide a seamless browsing experience on mobile devices is equally vital. Fast loading times, responsive design, and user-friendly navigation contribute to better user experiences, increasing the effectiveness of mobile advertising campaigns.

9

OFFER MOBILE PAYMENT OPTIONS

Offering convenient and secure mobile payment options, such as mobile wallets, in-app payments, or compatible payment gateways, streamlines the purchasing process and enhances customer satisfaction.

In conclusion, mobile advertising presents an unprecedented opportunity for businesses to reach and engage their target audience effectively in the ever-evolving digital landscape. By dispelling common misconceptions and employing a strategic, data-driven approach with well-defined objectives, in-depth target audience research, data analytics, ad format testing, geolocation targeting, and programmatic advertising, businesses can optimize their mobile advertising budget and achieve maximum ROI in the mobile-first era.

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"India remains a global payment processing hub"

Ruchin Kumar, *Vice President – South Asia, Futurex gives us a peek into the complex, but delicate, circuitry of financial payments in the digital age. He shows us where various wires like Unified Payments Interface (UPI), Society for Worldwide Interbank Financial Telecommunication (SWIFT), Central Bank Digital Currency (CBDC), security threats, cash, digital currencies and cryptography connect, intersect and dance together in the future that is emerging now. Excerpts from his interaction with* ***Pratima Harigunani:***

What has been the impact of 5G, digital payment interfaces, UPI, and ONDC in India?

5G networks are designed to deliver more bandwidth, less latency, and better wireless connectivity in general. Because mobile payments rely on wireless service, the two fields share a mutually beneficial relationship. Though 5G service is available in many places nationwide, the process of upgrading network infrastructure is ongoing. When enough progress has been made, many expect the number of 5G users to increase by a significant margin.

On the payments front in general, India remains a global payment processing hub. The Unified Payments Interface (UPI) standard has laid the foundation for billions of digital transactions to take place every month. Many of these transactions are conducted using mobile apps and QR codes. This massive scale is unique to the Indian market. None of it would be possible without the implementation of the Aadhaar biometric ID system to authenticate individual citizens.

Is this progress reflected on the B2B side as well?

On the level of B2B payments, the Open Network for Digital Commerce (ONDC) very recently implemented B2B payments on its network. This is expected to help enterprises leverage many more advantages that digitalisation can offer. Meanwhile, the fintech sector continues to see tremendous growth and innovation, driving demand for data security solutions that, in addition to being reliable and compliant, are just as agile and innovative as the fintech space.

How do you compare SWIFT and UPI from the payment angle?

While both UPI and the Society for Worldwide Interbank Financial Telecommunication (SWIFT) are large systems designed to facilitate payments, they are very different in several important ways. First, in terms of scope, SWIFT operates in hundreds of countries. It uses dedicated telecommunications infrastructure to allow financial institutions to exchange different types of financial messages, such as payments and securities trading instructions. UPI, on the other hand, is mainly used for peer-to-peer (P2P) payments between individuals and merchants, with further applications in bill payment and e-commerce.

> UPI has laid the foundation for billions of digital transactions every month and many of these transactions are conducted using mobile apps and QR codes.

Ruchin Kumar
Vice President – South Asia, Futurex

> Aadhaar has streamlined the process of authenticating individual identities, which has paved the way for more people to effectively use UPI.

How practical are new models like Blockchain and zero-proof contracts for the payment landscape?
From a cryptographic point of view, Blockchain technology relies on strong encryption to protect the integrity of its records. Zero-knowledge proofs, likewise, involve complex cryptographic operations to prove the validity of data. The cryptographic solutions to secure these models are readily available, but it may be rather early to make a definitive statement regarding their implementation in the payments sector.

Has technology helped to confront issues of penetration, financial literacy, inclusivity etc. in India?
The deployment of the Aadhaar number has streamlined the process of authenticating individual identities, which has paved the way for more and more people to effectively use UPI solutions in their daily lives, whether buying something from a local vendor or making a purchase online. In that sense, and given how many people now use UPI in some way, India's technology-driven financial initiatives have seemed to expand financial inclusion.

So, what excites you about India's financial landscape, especially on the CBDC front? Will it make a real impact?
As a digital liability of the central bank, CBDC or Central Bank Digital Currency has intriguing possibilities. In short, it would serve as a centrally-backed encrypted digital currency. Given the volatility of cryptocurrency, this could prove a safe and convenient option for individuals with an interest in anonymous digital currency. A representative of the RBI has stated that CBDC is expected to have the same anonymity as physical cash, which could provide further incentives to these individuals. India has demonstrated the viability of systems like UPI to the rest of the world; it will be interesting to see if the e-rupee unfolds similarly.

And do you think we will continue to use cash after five to eight years? Will the dilemma around convenience, privacy, and regulatory control ever be solved, particularly when a lot of people still prefer cash to cashless?
The digital payment ecosystem is always evolving, with some aspects proving their worth and enduring and many other aspects rapidly changing. As providers of cryptographic solutions, we seek to drive innovation in the industry, creating the solutions we would want to use. As for whether society is heading in a cashless direction or not, that question will be best answered over the coming years.

What about tokenisation, contactless payments, P2P transfers, and digital banking? Also, have we learnt any lessons from digital payments fraud?
If there's one thing fraud can teach us, it is the importance of having a holistic data security strategy. For example, an organisation may issue digital certificates to authenticate its employee workstations, but they can still be vulnerable if the employees are not trained to be vigilant against social engineering or phishing attempts.

Thankfully, as cybercrime and fraud continue to rise globally, so do the solutions and strategies that help combat it. There have been many advancements in the data security world as of late. Standards have emerged for contactless payments on COTS (CPoC), P2P transfers including those of UPI, and tokenisation, where the "token vaults" of old have been replaced by new "vault less" methods.

So, the world will continue to be dominated by BigFin and BigTech...
India is well known for its explosive fintech industry, where smaller and midsize organisations have found inventive new financial solutions. Several of these organisations have seen their valuations skyrocket, becoming Unicorns. As technology continues to advance, we are likely to see such innovations continue across many sectors of the economy.

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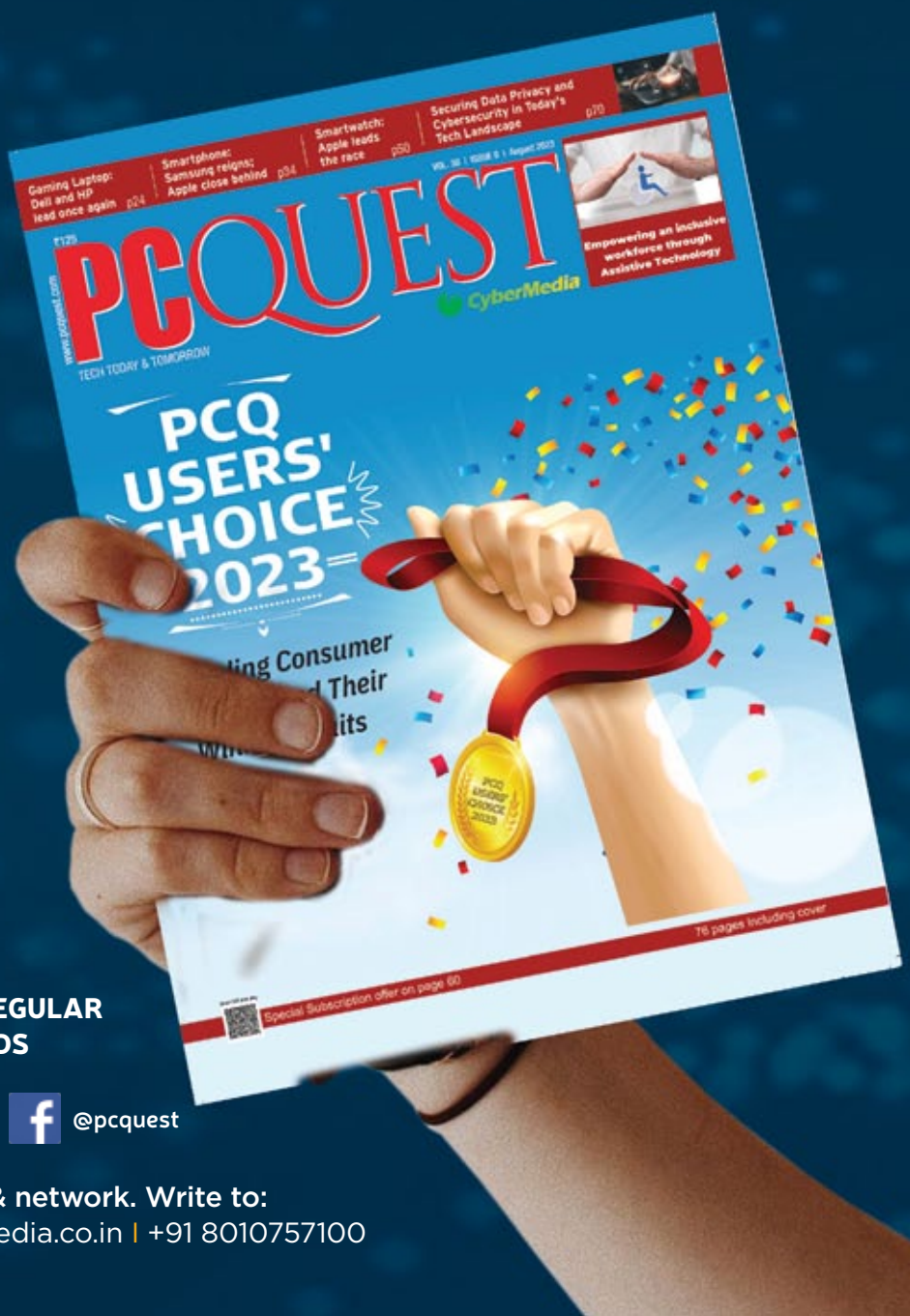

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Quantum takes a leap of faith

The Future Technologies Forum focused on tech sovereignty and its impact on geopolitics, and quantum supremacy in terms of practical applications and cybersecurity

BY SHUBHENDU PARTH

Quantum computing, once a staple of science fiction, could now become a reality soon. Imagine someone informing you that this technological marvel might materialise before the world even fully realises its dream of 6G connectivity. How would you respond to such a remarkable possibility?

Perhaps, ahead of time, one would say, and that was exactly what the Future Technologies Forum (FTF) in Moscow, 9–14 July intended to showcase. The conference focused on various aspects of high-tech research and their impact on society, technological sovereignty and how it shapes geopolitics, and quantum supremacy in terms of its practical applications and to drive cybersecurity.

The Forum also deliberated on issues like the ethics of the digital world, hiring talent and retaining them, the challenges of taking quantum communication from the R&D stage to business, the impact on medicines and healthcare, quantum computing and sensors, quantum internet, and the quantum city of the future, among others.

The key highlight of the FTF: most experts working on quantum technologies in Russia were optimistic that the widespread practical use of quantum computing will begin as early as 2025, and by 2030, technological leadership will be impossible without quantum technologies.

The optimism was unequivocally reflected in the plenary session that was addressed by the President of Russia Vladimir Putin. He pointed out that researchers in Russia are ready to tackle challenging scientific problems and clear the way for creating advanced solutions.

Talking about the role of technology and data in shaping the future world he proposed a new national project for the period to 2030, more specifically, a national project for forming a data economy, within a year.

"Let me emphasise, it is not just about consolidating existing tools to support the digital economy, Artificial Intelligence and high-tech projects, including roadmaps for advancing quantum technology, which you are

discussing today and which the companies partly owned by the state are now trying to put into practice – but to implement the existing developments in this area in practice," he said.

Putin further said that the country plans to present its case for collaboration at the BRICS (Brazil, Russia, India, China, and South Africa) Summit in Kazan next year. "With Russia holding the BRICS Presidency next year, we expect to discuss specific projects like this in several important areas with our partners, including cutting-edge computing technology, as well as data processing, storage and transmission technologies," he said.

The President emphasised that the focus on future technologies aims to transition the economy, the social sector and the authorities to essentially new principles of work and to introduce big data-based governance. "We expect a truly wide-ranging multiplier effect from it. This will help increase the quality of governance and labour productivity many times over, create jobs requiring advanced skills and offering high salaries, ensure the availability of services and offer essentially new opportunities to our people."

He pointed out that digital platforms will pave the way for the country's advancement in various sectors, enabling the development of smart cities and unmanned systems, utilisation of digital twins of technical systems and production processes, expansion of precision agriculture, the elevation of logistics and energy capabilities, the growth of telemedicine and online education, as well as the seamless provision of government services and financial transactions.

WHERE RUSSIA STANDS

During the FTF Putin visited an exhibition of Russian quantum technology achievements by Rosatom and Russian Railways. Putin was shown the new 16-qubit trapped-ion-based quantum computer. During the demonstration, experts were able to launch an algorithm for calculating a simple molecule, modelling it in real-time, via a cloud platform.

Developed by a team of scientists from the Russian Quantum Centre (RQC) and the Lebedev Physics Institute of the Russian Academy of Sciences, it is the most powerful quantum computer in Russia. Notably, the team has also run useful, molecule-simulating computations on it.

The processor uses the quantum annealing technology that makes use of trapped ion qubits with integrated photonics. This approach enables higher qubit count scalability while reducing the impact of noise or the changes such as vibrations, electromagnetic interference, and temperature that may destroy qubits' processing capabilities by collapsing the qubits' entanglement and state. In simple terms, Russia's quantum computer can perform practical tasks beyond scientific abstraction.

Reports indicate that quantum annealing systems, like the one used for the new 16-qubit quantum computer, can be used for solving real-world problems because they are much easier to scale and are extremely focused on what they attempt to do. The exhibition also showcased other practical uses for quantum communications by connecting the Centre for Managing and Monitoring the Russian Railways Quantum Network via videoconference.

In terms of using the new technology, the Russian Railways has already unveiled the plan to construct a backbone quantum network as part of the implementation of the Quantum Communications roadmap by 2030. Accordingly, the network will embrace 34 Russian regions to drive its adoption.

Besides, Russia is also developing other quantum computers. Among other programmes, the government announced in 2021 that it would invest USD 790 million in quantum computing research over the next five years. This investment is part of a larger effort by Russia to develop its technological capabilities and become a leader in the global economy.

MOSCOW'S INTEREST IN INDIA

In a bid to foster cross-border scientific advancements, Russian scientists have embarked on a series of collaborative missions with Indian institutes, signalling a promising initiative in quantum science and technology.

Speaking at the sidelines of the FTF, Ruslan Yunusov, Co-founder and CEO of Russian Quantum Centre (RQC) informed that the organisation was in discussions with academic and research institutions in India for collaboration to develop quantum applications and hardware for public use. While no official agreements or contracts have been signed to date, he indicated that formal deliberations on the matter could take place during the upcoming BRICS summit.

"The potential for cooperative ventures between scientists from both countries has generated considerable interest," Yunusov stated.

WHAT PUTIN SAID

President Vladimir Putin's address provided a comprehensive blueprint for constructing a data-driven economy to bring about transformative shifts across various sectors, including the economy, social spheres, public administration, and the overall quality of life across the nation.

- **Data Collection:** Begin with highly sensitive sensors, including quantum sensors, to enhance object positioning accuracy, detect diseases early, and advance fields like communication systems.
- **Data Transmission and Communication Systems:** Develop real-time data transmission capabilities for current and future generations, enabling robotics, unmanned transport, and urban automation.
- **Sovereign Infrastructure:** Establish domestic cloud platforms and data processing centres to support government agencies, enterprises, and telecom operators. Emphasise quantum and photon technologies for computing capacities.
- **Data Security:** Focus on quantum communications and encryption technologies to ensure cyberattack resistance, create unhackable systems, and develop secure quantum communications.
- **Sovereign Standards and Protocols:** Set national standards for data processing, storage, quantum cryptography, cybersecurity, and protection against attacks.
- **Algorithms and AI Solutions:** Develop data processing algorithms, artificial intelligence solutions, and domestic software to ensure data sovereignty, reduce dependence on foreign suppliers, and enhance control over critical infrastructure.
- **Code Repositories:** Establish domestic platforms and services to facilitate collaboration among programmers from Russia and other countries.

Speaking to the media delegation from India, Venu Gopal Achanta, Director, National Physical Laboratory (NPL) under the Council of Scientific and Industrial Research (CSIR), pointed out that the world of quantum science demands diverse expertise and perspectives, and collaborative efforts are crucial for unlocking its vast potential. "The potential collaboration holds great promise for both nations. We stand to gain invaluable scientific insights from the Russian Quantum Centre, which can help us understand the potential of various quantum applications," he said.

Achanta, who is working with the Indian government on its National Quantum Mission, also informed that during the last six months, Russian research teams have undertaken at least three visits to various Indian institutions, with a keen focus on exploring potential scientific collaborations.

Sharing more details on the possible collaboration, Aleksey Akimov, Principal Investigator – Quantum Simulators and Integrated Photonics group, RQC highlighted that Russia is eager to explore collaboration on advancing quantum computing capabilities with India. "RQC has successfully developed a 32-qubit quantum computer and is currently engaged in experimentation to apply quantum computing to public services. Collaborative efforts with India can focus on sharing technical expertise to establish standardised practices across diverse aspects of quantum computing," Akimov explained.

Russia's strategic focus on quantum technologies comes at a critical juncture when the world is just beginning to grasp its immense possibilities and implications. With its quantum annealing technology, Russia's quantum computer holds promise for real-world problem-solving, transcending theoretical abstractions. Moreover, Russia's interest in collaborating with India exemplifies the broader international efforts required to fully explore the multifaceted dimensions of quantum science and its applications.

In the coming years, Russia's progress in quantum computing and its collaborative ventures could potentially reshape industries, redefine security measures, and accelerate scientific breakthroughs.

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The author was in Moscow on an invitation from The Roscongress Foundation and Russian Quantum Centre to attend the Future Technologies Forum 2023.

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Telecom, networking decelerate tech spending

Three of the top four IT services companies in India disclose a YoY decline in tech spending among communications and networking clients around the world

BY VERNIKA AWAL

The June quarter earnings for India's multi-billion-dollar IT services sector closed last month, with analysts highlighting multiple factors behind the slump. A key factor that caused the quarterly slowdown was the communications sector, which saw a year-on-year (YoY) decline for three of the top four IT services companies in the country.

HOW COMPANIES FARED

Tata Consultancy Services (TCS), the largest IT services company in India in terms of market share, stands out as the sole member among the top four to have avoided a segmental decline. However, the growth reported in its communications and media segment was notably slim. The company's Q1 FY 2024 earnings reported revenue of USD 462.4 million from the communications and media vertical in the June quarter. This marked a marginal 0.5% YoY increase in constant currency (CC), which discounts currency fluctuations. Notably, the company's revenues from the vertical stood at USD 461.1 million during the same period in the previous fiscal.

Companies in the telecom space are holding back tech spending amid upgrades to 5G infrastructure, with concerns including macroeconomic headwinds.

IN SHORT

- **Indian IT Earnings Slump:** India's IT services sector faced a Q2 earnings slump, driven by multiple factors, including a slowdown in the communications sector.
- **TCS Resilience:** TCS, the largest IT firm, bucked the trend, reporting modest 0.5% YoY growth in its communications segment, despite overall sector challenges.
- **Infosys and Declining Communications:** Infosys saw a 5.6% YoY decline in communication client spending, impacting its overall Q2 earnings.
- **HCL Technologies Downturn:** HCL Tech faced a sharp 11.7% YoY drop in telecommunications and media client revenue, reflecting wider market challenges.
- **Wipro's Flat Growth:** Wipro announced a slight decline in revenue from communication clients, reflecting a broader trend of restrained tech spending.

Overall, the company's quarterly revenue grew 6.6% YoY to USD 7.23 billion, up from USD 6.78 billion in the year-ago period. The contribution of TCS' communications and media clients dropped to 6.4% during the AMJ quarter, down 40 basis points from 6.8% during the previous year.

Communications and media is TCS' smallest revenue contributor among major business segments.

In comparison, the same vertical represents the third-largest business avenue for India's second-largest IT services firm, Infosys. The Salil Parekh-headed company saw a decline of 5.6% YoY from its communication clients in the June quarter, down from USD 570.2 million in the year-ago period to USD 540.5 million during the quarter. Overall, contribution to total revenue from communication dropped by 1.3 percentage points to 11.7% — down from 13% in the year-ago quarter.

The drop was even sharper for the Noida-headquartered HCL Technologies, whose telecommunications and media clients, clubbed together with publishing and entertainment, dropped 11.7% YoY during the quarter. Overall, HCL Tech's revenue from this vertical dropped to USD 243.2 million during the quarter, down from USD 278.3 million during the previous year. Contribution from the segment dropped to 7.6% of HCL's total revenue — down from 9.2% in the same period last year.

Telecom companies are holding back tech spending amid upgrades to 5G infrastructure and concerns regarding macroeconomic headwinds.

Wipro, too, announced a decline, with revenue from its communications sector clients dropping to USD 127.9 million this June quarter, down from USD 135.2 million during the same period last year. The drop comes off the backdrop of flat growth for Wipro, which saw its net revenue reach USD 2.78 billion, a marginal increase from USD 2.76 billion in last year's June quarter.

WHAT THE LACK OF SPENDING MEANS?

The market dynamics show a clear decline in tech spending among telecommunications and networking clients around the world. Companies in the telecom space are holding back tech spending amid upgrades to 5G infrastructure, with concerns including macroeconomic headwinds leading to the slowdown in deal execution for companies.

It is this narrative that has remained common for all IT services companies during the June quarter; the chief executives of all four IT firms suggested that there are delays in tech deal execution by clients. This suggests that these clients are either prolonging their deal periods or cutting short existing deals by pushing back on discretionary spending. These discretionary spends in the communications space would include artificial intelligence (AI)-driven tech deployments for modernisation of services.

The one silver lining on the horizon is that companies are not outrightly cancelling the deals, but they are pushing the contracts back for more favourable business conditions, which analysts and brokerages point out is a showcase of the sector's resilience.

THE MARKET PROJECTION

An analysis of Infosys' quarterly earnings by brokerage firm BNP Paribas, published in a note to investors on 21 July, said, "Infosys' sharp cut in outlook could dampen investors' confidence in its guidance process. The business with a higher share of digital- and consulting-led projects is seeing a higher negative impact of discretionary project cuts, in our view. We see any widespread weakness in the IT Services companies' stock prices post this result as an opportunity for investors to start building positions in the sector. Our sector top pick TCS is better placed in this dynamic demand environment, in our view."

This shows that tech spending in the communications market is not entirely done away with — the cutdown is largely due to the adjustment of ongoing tech projects more to the tune of present economic conditions.

With most of the clients of the IT services firms coming from North America and Europe, the trajectory is a clear sign of how global firms in the telecom space are handling aspects such as 5G rollout, tech infrastructure upgrades, new software deployment, discretionary customer experience projects, private network deployments for enterprises, and more.

As such, analysts also note that this period of weakness could be used by communications clients to experiment with their various tools and services, in turn pushing for faster growth once the market starts showing signs of recovery.

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Airtel launches self-serve marketing communications platform

Telecommunications service provider, Bharti Airtel, has launched Airtel IQ Reach, a first-of-its-kind self-serve marketing communications platform, which will enable brands and companies to drive targeted customer engagements through personalised communications.

Launched under Airtel IQ, the world's first network-embedded Communications Platform as a Service (CPaaS), Airtel IQ Reach is an intuitive platform that enables small and medium businesses to make the most of their marketing investments as they engage with target customers in a cost-effective manner with prepaid pay-as-you-go plans.

Airtel envisions the self-serve portal as an all-in-one solution, empowering businesses, particularly emerging ones, with complete command over their campaign execution. Through a unified portal, businesses can effortlessly design personalised messages, choose or upload target audiences, set message schedules, and easily monitor campaign performance, all accomplished with utmost ease in a matter of clicks.

Airtel expects the self-serve portal to serve as a one-stop destination to empower businesses, especially emerging businesses, to have full control of their campaign execution. By logging on to a single portal, businesses can design customised messages, upload or select their target audiences, schedule their messages, and track campaign effectiveness with just a few clicks.

The platform will also offer real-time insights and comprehensive analytics on a centralised dashboard to enable businesses to measure their campaign effectiveness. Airtel IQ Reach will help SMBs solve key challenges when planning marketing campaigns like identifying the right audience, tracking campaign effectiveness, and managing multiple channels to reach their audience, amongst others

Deals

STL BAGS RS 250-CRORE DATACENTRE PROJECT

STL has secured a Rs 250-crore contract to build and maintain two datacentres for a public sector entity. Under the multi-year contract, STL will design, build, commission, and maintain the datacentre facilities, with service deployment at multiple network sites across India. It will also oversee the operations and management for three years. STL's datacentre connectivity and management solution is custom-designed to create intelligent and automated systems to run.

DHAKSHA TO SUPPLY 200 DRONES TO ARMY

Indian drone manufacturer, Dhaksha Unmanned Systems, has bagged an order to supply 200 medium-altitude logistics drones and accessories to the Indian Army. The company has also bagged a 400-drone contract from agri inputs cooperative IFFCO for the supply of agri-spraying drones. The company plans to deliver both orders during the next 12 months. Overall, Dhaksha's orders for the current year, including the orders from Defence and IFFCO, have exceeded Rs 165 crore.

NEC TO HELP TRACK VEHICLE LOCATION IN UP

NEC India has been selected as a master system integrator by Uttar Pradesh State Road Transport Corporation (UPSRTC) for the Vehicle Location Tracking (VLT) Passenger Information System project under the Nirbhaya fund of the Government of India. The project involves installing AIS 140-based VLT devices and emergency safety buttons across the majority of UPSRTC buses and tracking the entire fleet on the Uttar Pradesh state tracking platform.

Indian smartphone market declined 10% YoY in H1 2023

The smartphone market in India recorded a decline of 10% in the first half of 2023, compared to the same period in 2022. Overall, smartphone players shipped 64 million units during H1 2023. According to the IDC Worldwide Quarterly Mobile Phone Tracker, the smartphone market grew by 10% in the second quarter of 2023 over the previous quarter (QoQ) but declined by 3% year-on-year (YoY) with 34 million units.

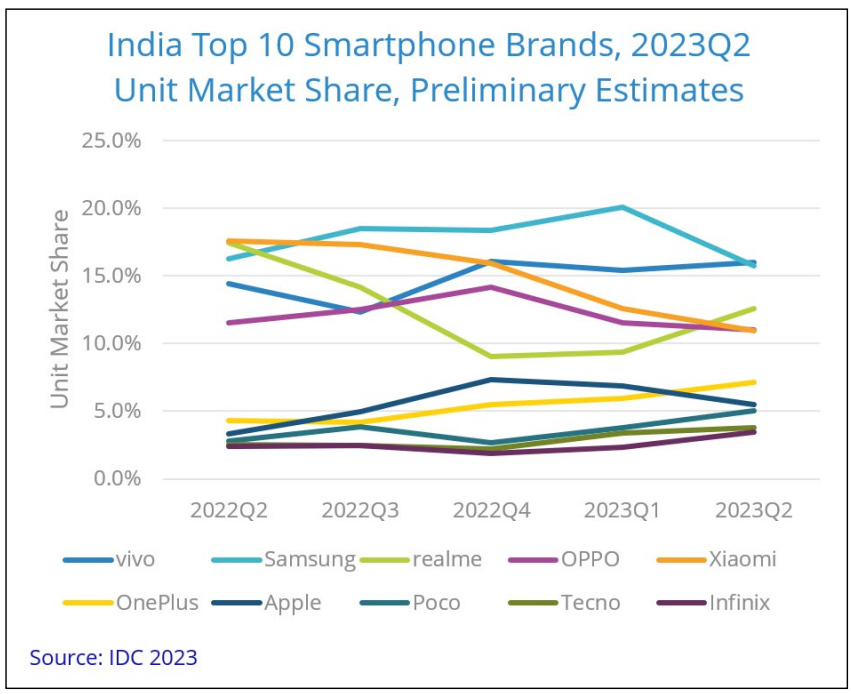
The report also indicates that after several quarters of growth, the average selling price (ASP) declined by 8% QoQ but grew by 13% YoY, reaching USD 241 in 2Q23. The share of the entry-level, sub-USD 200 handsets declined to 65% from 70% a year ago, a dip of 11% YoY.

The mid-range segment remained flat with a 22% share, while the mid-to-high-end segment with a 5% share, grew by 34% YoY in Q2 2023. The premium segment (USD 600+) grew the highest, up 75% YoY reaching 9% share.

"Consumers are opting for premium offerings, driven by easy and affordable financing options. IDC expects this growth momentum to continue in the upcoming months in 2023," said Upasana Joshi, Research Manager, Client Devices, IDC India.

Among the vendors, Vivo emerged at the top of the list with a 16% market share, followed by Samsung at 15.7% and Realme at 12.6%. Oppo, Xiaomi and OnePlus stood at fourth, fifth and sixth, while Apple was placed at seventh with a 5.5% share. Poco (5%), Tecno (3.8%), and Infinix (3.5%) completed the Top 10 list in Q2 2023.

The vendors and channels focused on clearing the inventory by offering discounts, special schemes, and price drops before the start of the festive season in the second half of the year. Interestingly, while the online distribution channels registered a decline of 15% YoY, offline sales grew by 11%, reaching a 54% share. Relatively lower shipments for the online-heavy players such as Xiaomi and Realme intensified this drop.



Source: IDC 2023

Overall, 17 million 5G smartphones with an ASP of USD 366 were shipped in Q2 2023, down 3% YoY. Samsung, Vivo and OnePlus were the leaders in the 5G segment with a combined share of 54%. Apple's iPhone 13 and OnePlus' Nord CE3 Lite were the highest-shipped 5G models in Q2 2023.

Apple, with the highest ASP of USD 929, registered a massive 61% YoY growth. OnePlus too registered a healthy growth of 61%, although its ASP dropped by 14% YoY to USD 346. Poco with its very affordable C series models registered the highest growth amongst the top ten brands. vivo (excluding iQOO) emerged as the market leader as it drove its growth for its V series models, closely followed by Samsung which focused on the growth of its higher-end portfolio as well.

IP-COM introduces 5-Port Gigabit Desktop Switch

IP-COM has launched the G1105P-4-63W 5-Port Gigabit Desktop Switch, featuring a 4-Port Power over Ethernet (PoE) switch to cater to the demands of high-performance Gigabit Ethernet networks. This innovative switch boasts 5 10/100/1000 Mbps Base-TX RJ45 ports, offering users unparalleled flexibility and efficiency in their networking setup.

The G1105P-4-63W is engineered to deliver a maximum PoE power output of 58W, effectively empowering devices such as Access Points (APs), IP cameras, and IP phones through the convenience of CAT5 cables. Each of the first four ports adheres to the IEEE802.3af and IEEE802.3at power supply standards, with an individual maximum PoE power output of 30W.

One standout feature is the lightning protection of up to 6kV, safeguarding both the ports and embedded power from potential surges. The switch is further fortified with protection mechanisms against PSE short-circuiting, PoE overloading, power over temperature, over-voltage, and surge currents, ensuring uninterrupted operation.

Enhancing network segmentation and control, the "one key VLAN mode" enables isolation of Ports 1-4 while maintaining communication with the fifth port. This intelligent design leverages Hardware DIP switches to thwart broadcast storms and counter DHCP spoofing.

Moreover, the G1105P-4-63W incorporates an advanced safety protection system, fortified QoS policies, multiple VLAN functionalities, and enhanced maintenance availability. IP-MAC-Port-VLAN binding and IP/MAC/ARP filtering provide an additional layer of security, making it an ideal choice for Gigabit wireless cabling and HD monitor networks in diverse environments such as large and medium enterprises, star hotels, and expansive shopping malls.

IP-COM's G1105P-4-63W offers a seamless blend of performance, reliability, and security, empowering businesses with a robust networking solution for their evolving needs, a company press release stated.

Established in 2007, IP-COM Networks specialises in commercial networking devices, providing high-speed, secure, easy-maintenance networking devices and solutions for enterprises. The company's existing product line includes enterprise routers and switches, customer premises equipment (CPE), WLAN, ProFi systems and accessories.

Movements

SAVI SOIN TO HEAD QUALCOMM INDIA

Qualcomm has appointed Savi Soin as Senior Vice President and President of its India operation. Soin will be reporting directly to the company's Chief Commercial Officer Jim Cathey. He will be responsible for leading and executing Qualcomm's strategy in India by fostering relationships with industry partners and the government across mobile, automotive, semiconductor, industrial, IoT and communication infrastructure sectors.

Soin has been with Qualcomm for more than 20 years, the last 10 years as part of Qualcomm's senior leadership team. In his new role, he will drive Qualcomm's efforts in the semiconductor and start-up ecosystem space, as well as focus on accelerating transformation in areas such as 5G, AI, IoT and Automotive.

ANANT MAHESHWARI TO LEAD HONEYWELL HIGH GROWTH REGION

Honeywell has named Anant Maheshwari as the President and CEO of its High Growth Region portfolio, effective 4 September 2023. He will succeed Ben Driggs, who will be taking another leadership role in the company. Maheshwari will be a Corporate Officer of the company, reporting directly to Honeywell CEO Vimal Kapur and will be located in Dubai.

He will lead business growth across Honeywell's geographies in China, India, Southeast Asia, Central and Eastern Europe, the Middle East, Central Asia, Africa and Latin America. Maheshwari joins Honeywell from Microsoft, where he served as President and CEO of Microsoft India. Previously, he held leadership roles at Honeywell from 2004 to 2016.

Kyndryl, Veritas unveil data protection and recovery solution

IT infrastructure services provider, Kyndryl has tied up with Veritas Technologies to launch two new services, Data Protection Risk Assessment with Veritas and Incident Recovery with Veritas. The services help enterprises protect and recover their critical data across on-premises, hybrid and multi-cloud environments.

The Data Protection Risk Assessment with Veritas is delivered through the Kyndryl Consult network of technology experts and provides a cyber resilience maturity assessment that analyses a customer's IT infrastructure and data against industry best practices.

Kyndryl combines its cyber resilience framework with Veritas' data management solutions to identify risks, cyber resilience gaps and security vulnerabilities. The flexible deployment model allows Kyndryl experts to customise the assessment for unique requirements, policies and processes from all types of organisations. The offering also provides unified insights across on-premises, hybrid and cloud environments, leveraging unique data points that give customers the visibility and information to better manage and protect their data.

Incident Recovery with Veritas is a fully managed service encompassing backup, disaster recovery and cyber recovery. A key differentiator of the solution is AI-based autonomous data management capabilities that drive intelligent automation, operational agility, efficiency at scale, and a consistent experience across clouds for rapid recovery in the event of a cyber incident. The solution enables organisations to mitigate risk and high costs of a data breach by leveraging features such as air-gapped protection, immutable storage, anomaly detection and recovery automation.

Wipro, Pure Storage to drive sustainable datacenter technology

Wipro Limited has announced that Wipro FullStride Cloud has partnered with Pure Storage to help clients accelerate their sustainability journey through the power of technology. The goal is to empower customers to drive a more sustainable datacentre footprint by providing more efficient strategies to minimise the environmental impact.

The two companies will leverage their sustainability and technological expertise to incorporate sustainable technology industry best practices into clients' technology infrastructure. This includes implementing improvements, guided by global industry standards, in overall datacentre footprint, direct carbon emissions in data storage systems and increased power efficiency.

An additional impact priority for the partnership will be around e-waste reduction. Instead of following the traditional method of replacing entire systems during hardware upgrades, the focus will be on continually upgrading an array of components. This approach promotes resource efficiency and contributes to a circular economy by extending the lifecycle of technology assets. For example, Wipro's Sustainable Technology and Impact intelligence solutions provide visibility and valuable insights into critical infrastructure by monitoring and managing assets' impact.

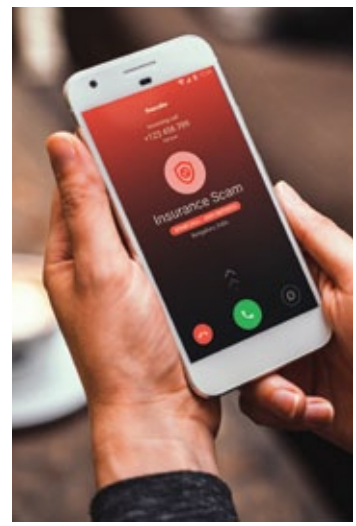
Talking about the value that the two companies jointly bring to the table, Jo Debecker, Global Head of Wipro FullStride Cloud, said: "Working with Pure Storage's solutions as the cornerstone of a hybrid cloud storage strategy, we recently helped a joint customer improve application performance, reduce storage costs, enhance data protection and disaster recovery capabilities while reducing datacentre storage footprint and carbon emissions by over 90%."

Tata Tele Business Services launches Smartflo UCaaS

Tata Tele Business Services (TTBS) has introduced Smartflo Unified Communication as a Service (UCaaS), an innovative voice solution seamlessly integrated with Microsoft Teams. This solution is designed to work in tandem with Direct Routing for Teams, enabling users to make PSTN calls, to both landline and mobile numbers, directly from their desktops, laptops, or mobile devices via the corporate network.

By embracing this model, users benefit from a unified communication experience coupled with inherent privacy features. The technology replaces conventional PBX systems and offers essential calling functionalities through a cloud-based call control system. Smartflo UCaaS harmoniously integrates various communication channels within an enterprise onto a single platform, amplifying employee efficiency and curtailing overall infrastructure expenditures within a secure environment.

Vodafone partners Truecaller to make communication safer



Vodafone Idea has announced that it has partnered with Truecaller to make communication with consumers more trusted, safe, and reliable. As a part of this collaboration, Truecaller through its Verified Business Caller ID solution has enabled Vi's customer service and sales team to deliver a secure and enhanced customer communication experience.

Amid the rising number of customer service frauds, it is imperative to ensure that customer interactions are safe and secure through trusted and verified communication from customer-centric businesses. The partnership will enable Vi customers to instantly recognise authentic calls from Vi through Truecaller's trustworthy call indicators such as a green caller id, a tamper-proof brand name and logo, a verified business badge, a category tag, and a call reason.

Movements

TECH MAHINDRA APPOINTS ATUL SONEJA AS COO

Tech Mahindra has appointed Atul Soneja as its new Chief Operating Officer (COO). With over 28 years of experience as a technology executive, Soneja is a proven leader known for deep strategic expertise, building a culture of success, and driving business transformation through focused execution in challenging and competitive markets.

Atul earlier served as the COO at CitiusTech where he was responsible for managing the overall delivery, service lines and operations. He has held several leadership roles in Infosys and its subsidiaries, from managing multi-billion service lines across multiple industry segments like financial services, retail and manufacturing, to heading the AI and automation platform business of Edgeverve.

NAVNIT NAKRA JOINS PINE LABS AS CRO

Pine Labs has appointed Navnit Nakra as its Chief Revenue Officer. He will be responsible for developing and executing growth strategies, new business generation, streamlining processes to attain efficiencies and maximising revenue streams for the payments business in India.

Before joining Pine Labs, Nakra was the CEO at OnePlus for India region where he spearheaded operations and the overall business strategy in the country. Previously, he worked with Apple, heading the Affordability business for India. He started his career with Citibank where he spent more than 14 years across consumer and institutional banking.

Cabinet approves Rs 1.39 lakh BharatNet revamp

The Union Cabinet has approved the allocation of Rs 1.39 lakh crore to revamp and modernise the BharatNet project, signalling a strategic shift in its execution approach. According to official sources, the initiative will entail the deployment of fibre connections to the last mile, facilitated through Village Level Entrepreneurs (VLEs).

With this investment, the government aims to achieve connectivity for all 640,000 villages within the next 2.5 years. The government's revamped model will engage local VLEs to extend fibre connections to homes, operating on a revenue-sharing basis of 50:50.

Under the new revamp model, the government will cover the infrastructure costs, while the VLEs will handle maintenance, operations, and customer service for home connections. This novel approach, tested successfully in a pilot involving local partners in 60,000 villages, is anticipated to generate employment opportunities for approximately 250,000 individuals.

Bharat Broadband Network (BBNL) is the pivotal agency overseeing BharatNet's implementation, having been merged with BSNL in the preceding year. Presently,

around 194,000 villages have been linked under the BharatNet umbrella, with internet access extended to 5,67,000 households. Notably, 351,000 fibre connections have been established through the innovative BharatNet Udyami project.

For BharatNet, this is the third such package approved by the Centre. In 2017, the Cabinet approved Rs 42,068 crore for the first two phases. In 2021, the Cabinet allocated another Rs 19,041 crore to implement the last-mile connectivity under a PPP model which failed to attract much interest.

T-Hub and Broadridge collaborate to drive Web3 innovation

T-Hub, a start-up ecosystem enabler, has partnered with fintech firm Broadridge to facilitate collaborations among corporates, start-ups, academia, and the Web3 community. This initiative is aimed to accelerate the adoption of Web3 technologies while providing start-ups with opportunities to tap into the expertise, experience, and resources of established corporates.

Web3 technology marks the evolution of the World Wide Web, encompassing decentralisation, blockchain technologies, and token-based economics. T-Hub and Broadridge are set to empower start-ups with mentorship, access to untapped markets, and potential funding avenues. Meanwhile, corporates stand to gain from the agility, innovation, and fresh perspectives that start-ups inherently bring.

Mahankali Srinivas Rao, CEO of T-Hub, emphasised, "Through this partnership, start-ups will get mentorship, access to new markets, and funding opportunities, while corporates will benefit from the agility, innovation, and fresh perspectives that startups bring along."

The collaboration is geared towards nurturing disruptive ideas and talent with the potential to reshape

sectors such as finance, supply chain, and healthcare. Broadridge, recognising the transformative potential of Web3, is keen on partnering with start-ups focusing on decentralised finance, non-fungible tokens (NFTs), and other digital assets.

German Soto Sanchez, Chief Strategy Officer of Broadridge, stated, "We recognise the importance of Web3 and its potential to transform industries and create new opportunities for businesses."

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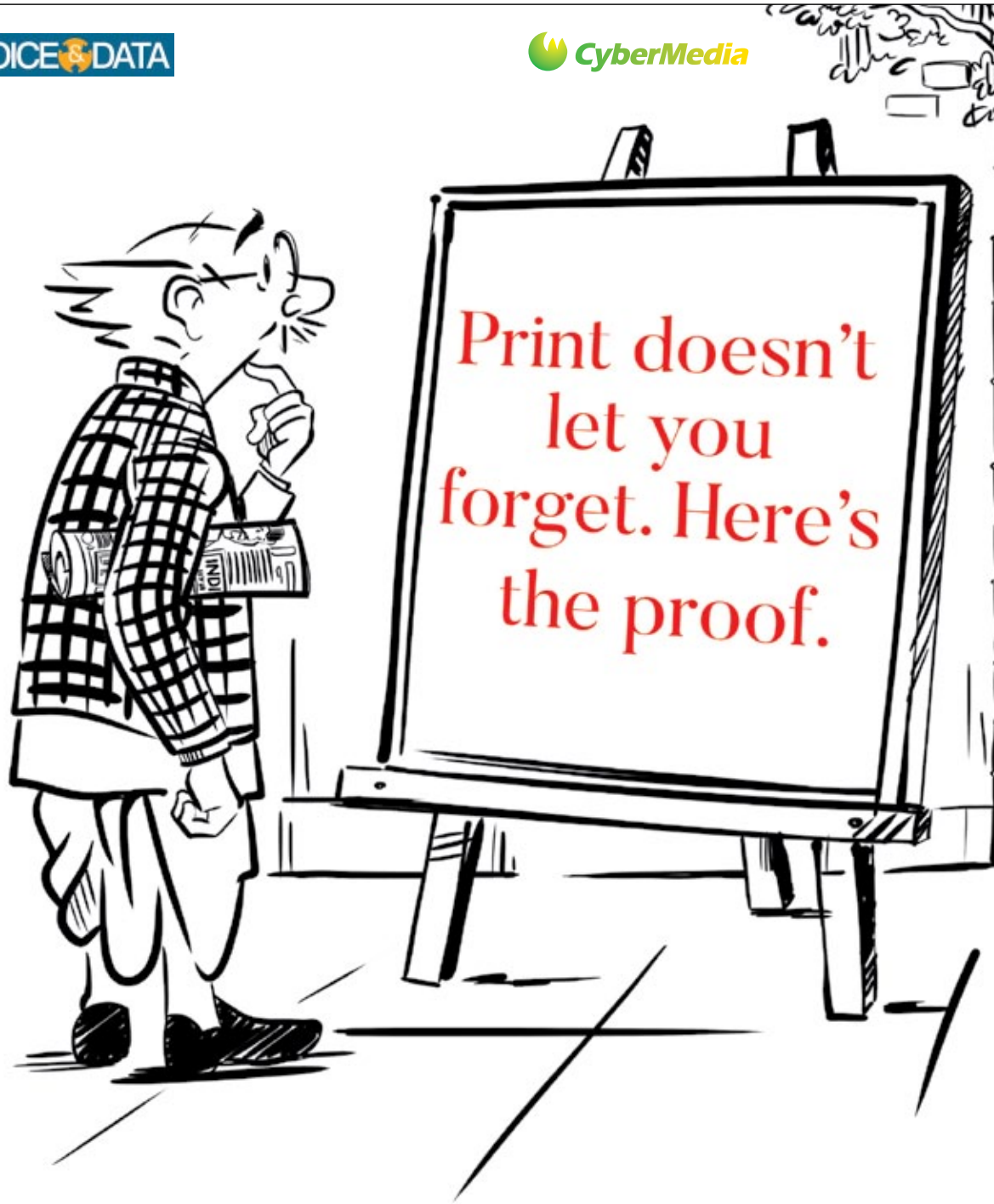

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