

For communications professionals in the southern Asian region

SOUTHERN ASIAN WIRELESS COMMUNICATIONS

Q4 2023

Volume 16 Number 4

- FWA – groundbreaking or fibre stopgap?
- Towercos: seizing opportunities
- Hybrid solutions for inflight connectivity

A portrait of Dr. Philipp Schulte, a man with short brown hair and glasses, wearing a dark suit and a white shirt. He is smiling and looking directly at the camera. The background is a blurred indoor setting with light-colored walls and a window.

Dr. Philipp Schulte
CEO of G+D Mobile Security



Giesecke+Devrient

**IoT: energy guzzler or
sustainability-multiplier?**



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G+D was founded in 1852 and today has a workforce of more than 14,000 employees. In the fiscal year 2022, the company generated a turnover of 2.53 billion euros. G+D is represented by 123 subsidiaries and joint ventures in 40 countries.

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EDITORIAL:

Editor:
Designer:
Sub editor:
Editorial director:
Contributors:

Amy Saunders
Ian Curtis
Gerry Moynihan
Kathy Moynihan
Harald Ludwig,
Asif Hamidullah,
Carlo Agdamag,
Subodh Vardhan,
Nassia Skoulakariti,
Himanshu Agarwal

ADVERTISEMENT SALES:

Sales: Karen Bailey
karenb@kadiumpublishing.com
+44 (0) 1932 481731

Production & circulation: Karen Bailey
karenb@kadiumpublishing.com
Tel: +44 (0) 1932 481728

Editorial enquiries:

amys@kadiumpublishing.com
kathym@kadiumpublishing.com
Tel: +44 (0) 1932 481729

Publishing director: Kathy Moynihan
kathym@kadiumpublishing.com
+44 (0) 1932 481730

PhilTower optimises power assets

PhilTower Consortium Inc. and PowerX have announced a strategic partnership that will see PhilTower roll out PowerX across its network to optimise power assets, uptime performance and energy efficiency.

Since its acquisition of 1,350 cell towers from Globe in 2022, PhilTower has been working diligently to transition and modernise the sites, with the first batch of towers fully operational within just five months. PhilTower has been continuously striving to establish efficient end-to-end operations from day one to support the smooth transition and operationalisation of all towers as governed by the sale and leaseback deal.

Advanced data intelligence and visualisation from PowerX will enable PhilTower to automate insights and speed up business and operational decisions for right-sizing power systems and optimising assets distribution across the portfolio. Integrating PowerX data intelligence platform into its Operations stack will also enable PhilTower to automate fast detection of operational inefficiencies, prioritise improvements and reduce mean time to repair faults. The benefits will lead to improved CAPEX and OPEX decisions, enabling PhilTower to scale sustainably and deliver a modern, fully digitised towerco infrastructure choice in the Philippines.

Currently, 90% of PhilTower's sites

in the Philippines include generators for power back up despite relatively good grid. PhilTower's mid-term ambition is to add renewable power generation options for their sites.

"PhilTower takes pride in leading the region's digital transformation journey. We are steadfast in our commitment to elevating cell tower infrastructure management and performance to always greater standards, all while delivering top-tier service to our valued mobile operator partners," said David Gubiani, CEO at PhilTower. "Our collaboration with PowerX is a testament to this dedication. PowerX's profound understanding of PhilTower's requirements instils confidence in our shared vision for revolutionizing connectivity through digitalisation. Together, we are harnessing advanced technologies to meet the demands of the industry, driving innovation and excellence in telecommunications."

"This collaboration underscores our pioneering role in the region, leveraging advanced and actionable deep data, AI and machine learning analytics for network efficiency," said PT Pawar, chief operations officer (COO) of PhilTower. "The results of our work to date speak volumes. The automation of network analytics at scale from PowerX has significantly reduced time to identify the specific sites with opportunity to optimise and the actions required

to better dimension our sites for cost-efficient power and uptime. The PowerX platform has already empowered our operations teams to take action and drive operational excellence. This step is about enhancing network performance, enabling smooth asset ownership transitions, and integrating data intelligence for future energy programs. I look forward to seeing our partnership with PowerX help realise these goals."

"We are delighted to partner with PhilTower, deploying the PowerX platform to help achieve their goals of delivering an efficient, resilient and sustainable network. Our approach leverages advanced data science capabilities and tools at scale across diverse data sets to unearth hidden inefficiencies, prioritise action and manage integrated workflows to resolution," said Andrew Schafer, CEO at PowerX. "This is especially crucial to support PhilTower's rapid operationalisation of newly acquired tower sites from Globe. The PhilTower leadership team's unwavering commitment to innovation and network performance aligns seamlessly with our mission to transform the mobile network industry. Together, we are enthusiastic about introducing these ground-breaking advantages to the Philippines, driving a new standard for network intelligence and site efficiency."

Globe Telecom raises battery theft alarm

Globe Telecom has reported a sharp rise in cases of battery theft in its network facilities, with 834 lost to thieves in the first half of the year, around 2.4 times higher than the 352 cases recorded for the entire of 2022.

Mindanao booked the highest number of incidents with 424, followed by Visayas with 363, and the Greater Manila Area with 47.

The batteries are crucial as backup power during area-specific commercial power outages, particularly in times of disaster. Without them, affected localities become vulnerable to telco service interruptions.

Over the past two months, Globe reported two incidents of battery theft in Metro Manila that occurred in broad daylight: one in Malabon on 23 September and another in Tondo on 20 October.

"Battery theft, especially those brazenly carried out during the day, are a stark reminder of the challenges we face. While we're dedicated to ensuring 24/7 reliability, the increasing incidents of battery theft undermine our ability to maintain uninterrupted service, especially during power outages," said Mike Honig, Globe head of network field maintenance for GMA.

While Globe is working with local authorities, it is urging Local Government Units (LGUs) to conduct random inspections in their areas since communities will also benefit from securing the equipment of telecom providers.

Globe has also warned the public that buying stolen property is subject to legal action. Those caught colluding in the purchase and sale of such property will also face legal consequences.

TCIL pitches Indian telco equipment to Angola, Gambia, and Mauritius

Telecommunications Consultants India Limited (TCIL) is reportedly making moves to convince operators in Angola, Gambia, and Mauritius to buy telecoms equipment from

Indian companies.

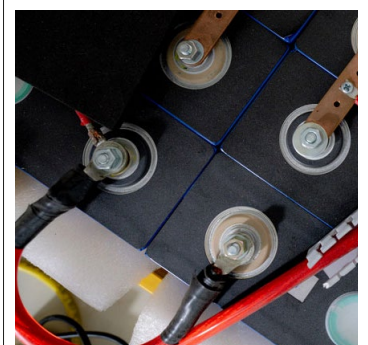
TCIL has conducted market surveys for Angola, Gambia, and Mauritius, and aims to pitch Indian equipment from C-DoT and Tejas as viable upgrade alternatives.

India has been keen to build itself up as a major exporter of telecoms equipment, particularly for 5G and 6G. The Department of Telecommunication's R&D arm, Centre for Development of Telematics (C-DoT) has been developing indigenous solutions for 4G and 5G networks.

Bharat Sanchar Nigam Limited (BSNL) has deployed C-DoT's 4G

core, as well as radio equipment from Tejas Networks. It's planning to deploy C-DoT's standalone 5G equipment next year, including a 5G SA radio, core and IP Multimedia System.

Mauritius Telecom has already agreed to a proof of concept on one of its islands, starting with three 4G base stations and a hybrid optical line terminal (OLT) from Tejas with a converged core from C-DoT, plus a one E-band radio from Astra. Gamtel and its wireless arm Gamcel are also keen on the idea and have recommended that the government to adopt TCIL's proposal.



Smart Bangladesh: Teletalk and Banglalink strike roaming deal

Teletalk and Veon's Banglalink have commenced a field trial of roaming services to enhance coverage in certain regions of the country, which will allow the customers of both operators to access each other's network coverage for the first time in the country.

"As part of our commitment to providing best-in-class services,

our goal as a digital operator is to enhance mobile connectivity across Bangladesh and promote network sharing between the two operators," said Banglalink.

The partnership will enable Teletalk to expand its network coverage by utilizing over 15,000 Banglalink sites across the country.

Upon completion of the field trial, the service will be available for commercial use, allowing customers to enjoy seamless national coverage across all services. This initiative also aims to promote energy conservation and green infrastructure development for the country, aligning with the vision of a Smart Bangladesh.

Singapore Airlines rejuvenates communications and collaboration systems

Tata Communications has announced a multi-year agreement to transform the Singapore Airlines (SIA) communications and collaboration tools to enhance employee productivity and boost user experience.

This new transformative initiative delivered on Tata Communications GlobalRapid platform enables SIA users to be connected and collaborative anytime and anywhere globally.

"We take great pride in our long-standing relationship with Singapore Airlines. As a global CommTech player, we are privileged to be chosen as their partner in progress as they emerge stronger than ever and strive to create new benchmarks in customer experiences," said Amitabh Sarkar, vice president & head of Asia Pacific and Japan – enterprise, Tata Communications.

Tata Communications has been

working with SIA for the last five years and in addition to the above solutions, Tata Communications IZOTM SDWAN also enables SIA with intelligent customer call routing to their global customer service centres, ensuring a seamless customer experience.

Additionally, SIA pilot and cabin crew collaboration platforms are also powered by Tata Communications

MOVE enabling global and always connected experience to the crew. MOVE global intelligent cellular connectivity facilitates a swift and secure exchange of critical flight and passenger data on pilots and crew tablets, leading to expedited flight turn-round and enhanced on-time performance while achieving significant cost savings compared to traditional data roaming solution.



Jio and OneWeb win Indian satellite licences

Jio Satellite Communications Ltd and Eutelsat OneWeb have received the necessary licenses to offer satellite internet in India.

The companies have the GMPSC (Global Mobile Personal Communication by Satellite) license along with a pan-India ISP (Internet Service Provider) license. The Department of Telecommunications (DoT) has allotted ISP-A along with a VSAT (Very Small Aperture Terminal) license to OneWeb. Jio won the ISP license in October.

However, satellite spectrum remains a hurdle; it is currently under debate internally by the government. Some parties want it to be allocated administratively, while others want it to be auctioned.

Four of the remotest locations in India have already been connected with JioSpaceFiber - Gir (Gujarat), Korba (Chhattisgarh), Nabrangpur (Odisha), and ONGC (Jorhat, Assam) - a satellite-based gigabit speed service.

Amazon and Starlink are also trying to obtain the GMPSC license in India. Starlink is expected to receive the license soon. In India, the company tried to sell pre-bookings but was asked by the authorities to refund the amount to the customers and stop selling pre-bookings without the necessary licenses to offer services.

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Telcos to lose \$3 billion in SMS revenues to OTT channels in 2023-2028

Telecom operators globally are going to lose \$3 billion of SMS revenue from enterprises in the coming years according to a new study by Juniper Research.

OTT business messaging traffic will increase to 375 billion messages in 2028 from 100 billion messages in 2023. The rise of OTT

business messaging will be fuelled by enterprises that will be left dissatisfied with the diminishing quality of SMS networks. Thus, the report suggests that in the next five years, the telcos will lose out on about \$3 billion in SMS business messaging revenue globally to OTT channels.



Large enterprises and small businesses have already started to leverage OTT platforms such as WhatsApp to communicate more personally with their customers and that too at a lower cost. If the OTT app vendors deploy pricing strategies that attract high-spending enterprises, then they can be swayed away from established business channels.

The quality of the SMS networks is reducing, the cost is increasing each year, as are levels of fraud. These factors will push enterprises to try out alternative methods or channels of communicating with their customers. Thus, OTT app vendors must have a great pricing model to attract the enterprises their way.

The report forecasts that there will be a large increase in OTT business messaging spending for retail. The figure is expected to go up from \$790 million globally in 2023 to over \$2.6 billion by 2028.

Now Corp brings satcoms to remote Philippines regions

Now Corporation signed a memorandum of understanding with AST SpaceMobile in a move to connect remote locations in the Philippines.

"This initiative focuses on providing comprehensive communication services, including voice, video, data, and internet connectivity, to remote regions with limited or non-existent infrastructure," said Now Corporation in a statement.

"Every Filipino could connect his mobile phone from anywhere nationwide through NOW partner AST's single cell site in the sky," said Now Corporation chairman Mel Velarde.

The partnership supports its Trusted Network initiative, as it aims to only partner with vendors it deems not a security risk.

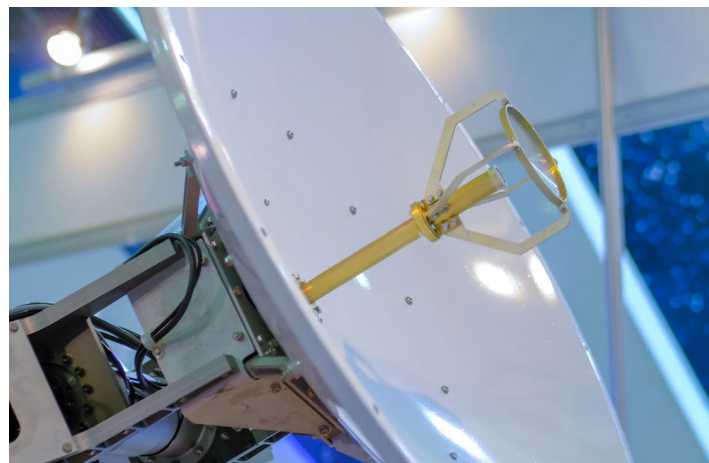
Now Corporation also recently signed an MoU with Mangata Networks to provide broadband satellite and edge computing solutions to enterprises in the Philippines, although actual services will not be rolled out until Mangata launches its satellites in several years.

Mangata is planning to build a constellation of eight highly elliptical orbit (HEO) and 24 MEO (medium Earth orbit) satellites capable of providing connection speeds of more than 10Gbps to a single site. The satellites will be combined with a terrestrial network of edge data centres, enabling Mangata to provide seamless connectivity and intelligent cloud computing services worldwide. Mangata said that the relatively low HEO and MEO orbits enable it to support real-time connectivity in remote locations with round-trip

latencies of less than 100ms.

NOW Corp said that it's collaborating with Mangata to respond to increasing demand from Philippines enterprises for robust, high-capacity, low-latency connectivity with reliable SLAs. Mangata's SLA guarantees excellent service quality and 99.5% network availability.

The partnership aligns with NOW's grant from the USTDA to develop digital infrastructure and expand access to reliable connectivity across the Philippines.



MarineMobile 5G increases fishing yields by 11%

Telkomsel and ZTE have launched MarineMobile, a 5G-based mobile maritime solution designed to help fishermen overcome operational challenges.

This long-range mobile communications solution provides access to weather forecasts, optical fishing location determination, GPS tracking, and real-time access to direct fish buyers in the market, according to the official release.

The collaboration focuses on testing the enhancement of 5G network capabilities based on the 2.3GHz frequency band, aiming to expand broadband service coverage for maritime regions.

Initiated in February 2023, Telkomsel and ZTE teamed up to test the use of 5G networks to meet the digital connectivity needs of Indonesia's maritime regions. The trial subsequently resulted in the introduction of the MarineMobile solution, which integrates Massive MIMO technology and Ultra 5G coverage features, utilising ZTE i5GC. The device is reportedly said to have flexible network backhaul support and can deliver low latency and high throughput of up to 250Mbps.

Telkomsel's broadband coverage in the maritime region of Gorontalo was improved using ZTE's 5G radio devices with active antenna technology. These devices can achieve a coverage distance of up to 72km for 2G, 69km for 4G/LTE, and 60km for 5G in open waters. This seamless connectivity has reportedly led to enhanced operational effectiveness and efficiency, reduced costs, and increased profits through more precise fishing activities.

Telkomsel and ZTE note that the enhancement of the broadband network in the coastal areas has resulted in an 11% increase in fish catch volume, reaching 9,070 tons in the second quarter of 2023 compared to the previous year.

Fishing remains a key contributor to GDP in coastal southern Asian nations, as well as providing a livelihood and food source for the local population.

Vodafone Idea and C-DOT advance IoT standardisation

Vodafone Idea (Vi) and the Centre for Development of Telematics (C-DOT) have joined forces to create an IoT Lab dedicated to advancing standardisation and interoperability within the IoT ecosystem.

To date, more than 50 devices across various industries, including automotive, utilities, BFSI, logistics, and more, have undergone testing. The lab not only assesses network performance in accordance with device requirements, but also certifies solution interoperability in promoting the adoption of oneM2M standards, which have been adopted as the national standard for IoT solution design by BIS.

Vi Business, the enterprise division of Vodafone Idea, has introduced this Lab-as-a-Service initiative. It can conduct tests across 175+ scenarios, encompassing network, functional, field, application, compatibility, and oneM2M standard testing, among others. It can also assess 30+ diverse use cases across industries, including AMI, Connected Car, POS, VTS, and more. The lab's capabilities extend to testing a wide range of ecosystem components, from devices and modules to SIMs, applications, firmware, and more.

To date, five devices have been certified as 'network-ready,' and the lab is now expanding its testing to include 5G and NB-IoT devices.

"We are pleased to share that Vi IoT Lab in partnership with C-DOT has enabled its partners with the right IoT deployment especially bringing standardisation and interoperability," said Arvind Nevatia, chief enterprise business officer at Vi. "We are delighted to further strengthen this partnership by establishing 'centre of innovation' which will bring synergies between Startups and the M2M/IoT Industry. This collaboration is a reflection of our ongoing efforts to improve the domestic IoT ecosystem while contributing to the growth of the Indian economy."

This certification enables IoT service providers by allowing them to comply with global standards for faster time-to-market and increased revenue realisation and Enhance credibility through interoperability and standardisation in line with oneM2M standards.

Malaysia expects operators to finally sign DNB share subscription agreements by year-end

Malaysia's government expects its MNOs to finalise agreements to acquire stakes in wholesale 5G operator Digital Nasional Bhd (DNB) by the end of the year.

The country's five MNOs – CelcomDigi, Maxis, Telekom Malaysia, U Mobile and YTL Communications – have agreed to take equal stakes in DNB

but have not yet signed the official share subscription agreements (SSAs).

Communications and digital minister Fahmi Fadzil had previously said the SSAs would be signed by mid-October. According to Fahmi, this has been delayed due to the process of reviewing the details of

the SSAs taking longer than expected. However, now this process has been completed, the SSAs are on track to be signed by the end of this year.

"We are almost ready to announce a date for signing. I just need to have a quick word with all of the MNOs very soon," said Fadzil.

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GSOA releases sustainability code of conduct to safeguard space

The Global Satellite Operators Association (GSOA) has released its Code of Conduct on Space Sustainability, calling on operators to implement responsible practices that mitigate the risk of in-orbit collision, minimize the threat of non-trackable debris, protect humans in space and limit effects on optical astronomy.

Satellite communications provide essential connectivity that complements terrestrial networks and contributes to the delivery of universal service and coverage. Satellite connectivity can significantly help reduce the digital divide, as the number of satellite broadband users is set to double to at least 500 million people by 2030.

"Satellites in all orbits deliver vital satellite connectivity and high throughput broadband services. While they offer great promises in bridging the digital divide, they must be launched, deployed, operated and disposed of in a responsible manner," said Isabelle Mauro, director general of GSOA.

"The satellite industry has proven vital to helping bridge the digital

divide and connect the unconnected, whether they are on land, at sea or in the air. These vital services depend on protecting and preserving access to space," said GSOA chairman Dan Goldberg, CEO of Telesat Corporation.

"The development and industry-wide approval of the Code of Conduct is an important step in identifying best practices and mitigations to preserve access to space for future generations."

"As the satellite industry continues to grow and is expected to bring socio-economic benefits worth more than US\$250 billion globally, it is important that the industry works together to implement key sustainability practices that enable the world to continue benefitting from satellites," said GSOA vice-chair, Ali Alhashemi, Group CEO of Yahsat.

"The Code of Conduct is a significant first step in safeguarding space resources. GSOA will continue to analyse additional matters and progress its work and efforts in this important area," said Eva Berneke, GSOA vice-chair, CEO of Eutelsat Group.

The Code of Conduct endorses, and recommends that operators

comply with practices in four space sustainability areas:

- **Mitigating the risk of in-orbit collision:** Operators should take all reasonable steps to share information with other operators about trackable debris that they may have or may not have generated through the operation of their spacecraft.
- **Minimize the Threat of Non-Trackable Debris:** Operators should take steps in the design, launch, orbit raising, operational and de-orbit phases of the spacecraft mission – to ensure that their satellites do not become debris.
- **Preserving human life in space:** Human life should be protected and operators should ensure that astronauts are not put at risk.
- **Limiting impact on optical astronomy:** Operators and astronomers should work together to minimise negative impacts on ground-based optical astronomy, while allowing observation at optical wavelengths and ensuring the delivery of satellite services.

True Corp's 'Single Grid' plan already producing results

True Corp's 'Single Grid' initiative to consolidate the networks of True and Dtac is already producing better network coverage and signal quality in pilot projects.

True finalized its merger with Dtac in February 2023. Since then, it's been relying on roaming to serve True and Dtac customers across both networks. True says more than 76% of customers can now access both networks seamlessly on the 2600MHz and 700MHz bands.

True's 'Single Grid' project aims to consolidate the base station towers and spectrums of the two networks. The goal is to reduce redundant towers without reducing the total number of base stations and utilizes spectrum consolidation to unify and enhance signal speeds.

"We are integrating our infrastructure and adjusting the redundant signal towers. In doing so, we are creating a network with improved signal quality and coverage," said True CTO Prathet Tankuranun. "Leveraging our data insights, we have delved deeply into usage details in each area and are implementing modern tower signal technology to consolidate our wide and diverse range of spectrums."

True has already completed spectrum-consolidation pilot projects in South Thailand, where 4G and 5G signals are now stronger and more stable, particularly for home usage. Meanwhile, signal capacity has increased, allowing for more usage in all bands.

"Based on the conducted pilot tests of 5G at 2600MHz, 5G at 700MHz, 4G on the low band, and 4G on the mid-band, it has been found that the signals are approximately two times faster and stronger," said Tankuranun.

The combined True-Dtac network has spectrum in the 700MHz, 850MHz, 900MHz, 1800MHz, 2100MHz, 2300MHz, 2600MHz, and 26GHz bands. True expects to complete the project in 2025.

IOH and Setara Networks partner on digital payments

Indosat Ooredoo Hutchison (IOH) is collaborating with Setara Networks (Tara) to launch zero-fee instant transaction features to further accelerate the adoption of digital payments in Indonesia.

The two companies have created and integrated a seamless and secure payments network within IOH's Bima+ lifestyle app with a count capped zero-fee model. Users need to create a one-time unique Pay-ID linked with their mobile

number that can be used for all their transactions. Once they do that, they can make secure and faster digital transactions from anywhere with just one click without having to download additional applications or paying additional fees.

IOH says Tara's OneClick Checkout technology will bring down the average time of transaction to 20 seconds compared to virtual account payments where the user has to login to a bank app to complete

the payment. The same payment tech will soon be available via IOH's myIM3 consumer app.

Sabrina Lee, SVP and head of IOH's digital business unit, says the one-click zero-fee payment feature will give the operator a leg up in Indonesia's fast-growing digital payments market. "The ease and speed of digital transactions with just one click will be Indosat's key differentiation from other service providers," said Lee.

BSNL targets 4,300 Andhra Pradesh sites with 4G

Bharat Sanchar Nigam Limited (BSNL) will soon launch its 'Swadeshi 4G' in 4,300 sites in Andhra Pradesh.

According to BSNL's chief general manager M. Seshachalam, the beta launch of BSNL's homegrown 4G was completed in Punjab in July and very soon, 4G equipment will be commissioned at 4,300 sites in Andhra Pradesh. The network has

been designed to be upgraded to 5G at a later date.

Seshachalam said that the central government's 'Antyodaya Vision' will ensure digital inclusivity reaches every nook and corner of the state. BSNL will deploy 1,536 towers in remote locations in the Andhra Pradesh circle and 4G in 3,800 villages.



Nokia and Tata Play Fiber to launch India's first WiFi 6-ready network

Nokia has entered into an agreement with Tata Play Fiber to launch India's first WiFi 6-ready broadband network.

With increasing broadband usage in both residential and enterprise areas, there is significant demand for new, high-capacity broadband connections.

Nokia will supply Tata Play Fiber with a range of FTTH and WiFi equipment to support its broadband network expansion across India.

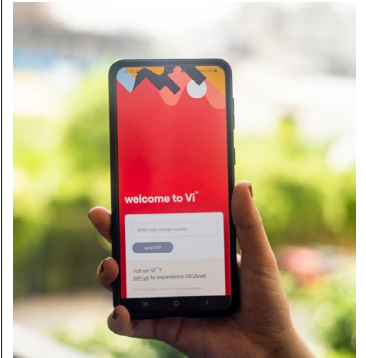
The vendor will provide its state-of-the-art optical line terminal (OLT), optical network terminal (ONT) with WiFi 6, and WiFi mesh beacons. The easy-to-install solution supports low-latency applications such as gaming and can deliver gigabit speeds to multiple devices on the WiFi network. Network security is also enhanced, with support for the Wi-Fi Alliance-endorsed WPA3 standard.

A key feature of the Nokia solution is its mesh technology, which will

ensure seamless coverage for large customer premises and areas with barriers like concrete walls. The WiFi 6 mesh technology is ideally suited to residential homes with large and/or multi-floor spaces, as well as for SOHO enterprises, which represent a large addressable market in India. The Nokia solution also uses AI/ML software to identify traffic patterns, faults and potential outages in the GPON network so as to optimise the end user experience.

COAI: 6GHz allocated to WiFi 'a waste'

According to the Cellular Operators Association of India (COAI), spectrum in the 6GHz band is needed to enable nationwide 5G coverage without sacrificing data speeds and allocating it for WiFi use would be wasting it.



COAI has been pushing India's Department of Telecommunication (DoT) to release more mid-band spectrum to support further 5G rollouts. The DoT has currently only released 720MHz of mid-band spectrum, and the 6GHz band isn't available in its next planned 5G auction. However, COAI says the 6GHz band could provide another 1200 MHz that telcos could use to help expand 5G coverage nationwide. A 2022 study from the GSMA reported that 5G needs at least 2GHz of mid-band spectrum to be able to support download speeds of 100Mbps and upload speeds of 50Mbps.

"If you want a good 5G, you need 2GHz. And to get that 2 GHz, we are looking at 6 GHz spectrum band because there, exactly 1200 MHz is available," said COAI director general SP Kochhar. "So, we are saying that this is uncluttered, you have not used it up anywhere, so give it to us."

However, that puts telcos at odds with WiFi companies who want the 6GHz band to remain unlicensed – like 2.4GHz and 5GHz – for WiFi usage. The latest WiFi standard, WiFi 6E, is designed to enable WiFi 6 to operate in the 6GHz band.

"The government has given 2.4GHz and 5.2GHz as a free spectrum. Have they used it fully? They will not be able to use 6GHz also. They will keep it and use it as and when required," said Kochhar.

Malaysia aims for 85% 5G coverage by end of 2024

The Malaysian government aims to extend 5G coverage to at least 85% of the country's rural population by the end of 2024, with the remaining areas served by broadband satellites.

Deputy prime minister Datuk Seri Dr Ahmad Zahid Hamidi said that



the government wants at least half of rural areas to have 5G coverage by the middle of 2024.

"We are carrying out this coordination, because we feel that rural folks deserve it also," said Hamidi. "We don't want when trying to get access to the internet, they have to climb up trees to get coverage."

The government is capping its 5G rural coverage target at 85% because the other 15% will be the mountainous areas where it's too difficult and expensive to build

and operate 5G.

For the indigenous Orang Asli population that lives in those areas, the Ministry of Rural and Regional Development is working with the Ministry of Communications and Digital and the Orang Asli Development Department to install Starlink satellite devices.

The 2024 budget tabled by prime minister Anwar Ibrahim includes RM333 million for the Orang Asli community for socio-economic development projects, infrastructure, and social assistance.

HCI agrees managed services deal with India's leading cement companies

Hughes Communications India (HCI) – a joint venture between Hughes Network Systems and Bharti Airtel – has announced a new managed services deal for cement companies ACC and Ambuja Cement, through which it plans to deploy dual LTE/4G at over 100 manufacturing and field units across India.

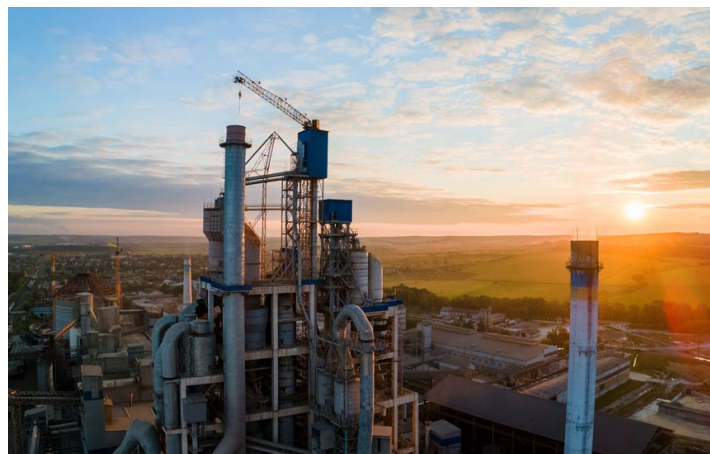
This managed service from HCI adds a diverse path backup to the software-defined wide area network (SDWAN) deployed by the two cement companies in their manufacturing units. The managed service will improve network reliability to support critical business processes and applications.

HCI will provide a turnkey solution, including setup, installation, and support for all

sites. The 2Mbps LTE/4G links come from different telecom operators with auto failover between the LTE links.

The customer premises equipment will have two independent LTE ports and modules

which support all the major routing and security protocols. In the event of a primary network failure, the HCI solution will provide connectivity for critical business applications like enterprise resource planning (ERP), voice and internet.



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Going further in critical communications



India: more than 47,000 BTS installed in two months

In September and October, the deployment of 5G Base Transceiver Stations (BTS) by operators in India has witnessed significant growth, exceeding 47,000.

In the last two months alone, a total of 47,316 BTS have been deployed across all states and Union Territories, as reported by the Department of Telecommunications (DoT).

Consumers can now experience 5G in Lakshadweep, as the DoT reported the deployment of two 5G BTS in October. In September, Bharti Airtel announced that Airtel 5G services are available across all districts in the country, except for the islands of Lakshadweep, which are connected through a Very Small Aperture Terminal (VSAT). In 2019, Bharti Airtel became the first mobile operator to launch 4G services on the tropical archipelago. During the launch, Airtel 4G went live in Kavaratti, Bangaram, and Agatti islands, enabling this popular tourist destination with high-speed mobile connectivity.

Uttar Pradesh witnessed the highest number of 5G BTS additions with 6,772, followed by Maharashtra with 5,915 BTS, Bihar with 4,903 BTS, Rajasthan with 4,112 BTS, West Bengal with 3,474 BTS, and Gujarat with 3,287 5G BTS additions during the mentioned duration. In contrast, Manipur witnessed zero 5G BTS additions. Notably, Andaman and Nicobar saw the addition of 8 5G BTS, and Lakshadweep witnessed its first 5G BTS during the period.

As per the most recent update by the Department of Telecommunications (DoT), India has a 4G network coverage reaching 99% of the country, and 5G is experiencing one of the fastest rollouts globally. Only Airtel and Jio are currently live with 5G in India and are actively deploying 5G networks at a record pace to complete the 5G rollouts as per their scheduled timelines, respectively.



Talking critical

Harald Ludwig, chair, TCCA Technical Forum



Working on conformance – an essential step towards 3GPP standards compliant mission critical products

Many mission critical organisations in public safety, railways and other sectors are planning to move from their narrowband TETRA, GSM-R or P25 systems towards mission critical broadband systems, which support mission critical services, known as MCX. The 'X' in MCX stands for MCPTT (Mission Critical Push-To-Talk), MCVideo and MCDATA. These are the services that 3GPP has standardised especially for the mission critical user base. The MCX services are using a 4G or 5G system as the transport layer.

The mission critical users and operators need assurance that the products they are using (mission critical devices with MCX clients and MCX servers) are fully compliant to the 3GPP standards. Only this compliance allows them to fully utilise the multi-vendor market. It allows them to purchase products from different vendors and use them on their systems, similar to how consumers expect today to use their smartphones on every network in the world. Standards compliance promotes a healthy ecosystem of innovation, choice, and price competition, and means mission critical network operators and users are not tied to a single supplier or forced into contracts for proprietary products.

Therefore, it is very important to ensure the products comply to the 3GPP standards. This is done by conformance testing of the MCX client and server implementations. However, because MCX is a relatively new technology there are no test platforms available yet on which the mission critical products and implementations can be tested. Test platform vendors are working to get these platforms ready soon.

To facilitate 3GPP standards compliance and interoperability, ETSI has been organising MCX Plugtests™ since 2017 in which vendors can do some early testing of their implementations. The implementations, which can be prototypes or final

products, are tested against each other in the Plugtests. This is an opportunity for all participants in the Plugtests to ensure interoperability between their implementations and correct interpretation of the 3GPP standards. The Plugtests are not certification events, but they allow – in a dedicated test tools test stream – to check MCX client and server implementations against conformance test tools.

The test tools will need to undergo formal validation before they can be used for official certification testing. But before this formal validation they can also be 'tested' during the Plugtests. This testing of the test tools and the MCX clients and MCX servers is of mutual benefit. The tools can check their correct behaviour and the MCX clients and servers get an early exposure to (informal) conformance testing thus allowing them to make corrections before the products come to the market.

The eighth MCX Plugtests took place in Malaga, Spain in October 2023. This one-week event brought together 34 vendors and nearly 200 registered participants, which included 20 representatives from European and American governments, operators, and emergency bodies. Over the course of the week, individuals evaluated more than 360 different MCX and FRMCS (Future Railway Mobile Communication System) test scenarios at the University of Malaga's facilities. The primary objective of this event was to assess mission-critical services defined by 3GPP. These services are crucial for emergency responders such as fire departments, police, civil protection services, and ambulances, as they require secure and always available communication systems for emergency situations.

Some vendors tested their implementations against the test tools from Valid8 and MCS-TaaSting. It should be noted that both test tools are not officially validated yet. The following vendors took the opportunity for checking the conformance of their implementations:

- Nemergent, Alstom and Teltronic tested their MCX clients, which were installed on a Crosscall device, the Alstom on-board gateway and the Teltronic Cabradio, against the MCS-TaaSting and Valid8 conformance testers,

using the 4G LTE radio access.

- MC Labs, Alea, Frequentis, Kolibri and Teltronic tested their MCX clients, some of which are used in their dispatcher solutions, against the MCS-TaaSting and Valid8 conformance testers, using a direct IP connection.
- HMF Smart Solutions, MC Labs, Motorola Solutions, Streamwide and Nemergent tested their MCX servers against the Valid8 conformance tester.
- Rohill tested their Interworking Function (IWF) implementation on their TETRA system against the Valid8 conformance tester.

No individual results from the Plugtests are disclosed but it is good to see that these vendors are dedicated to developing standard-compliant products. They have received first reports on the conformance of their products and can use this information to ensure full conformance of their final implementations and products when they submit them for formal certification.

The Global Certification Forum (GCF) and TCCA are working together to establish a certification scheme for mission critical products. As soon as the first tester is validated the conformance testing and certification program can start. This is planned for the first half of 2024.

Ensuring mission critical devices and networks are interoperable is a key part of GCF's vision to enable the high quality, reliable and secure wireless communications demanded by users and industries across the globe. It is equally key to TCCA's vision to promote standardised critical communications solutions and the benefits of open and competitive markets in efficiently developing and delivering these solutions.

The next generation of mission critical services, delivered over 3GPP based networks and devices, will be revolutionary and their shape and scope are being defined now. GCF and TCCA are keen to ensure that all parties interested in ensuring the seamless interoperability of devices and networks in this new world have the opportunity to contribute to the discussion and, in doing so, help to fashion a certification programme that benefits all stakeholders.

Airtel and Vi divest FireFly Networks stakes to Manipura Digital Infrastructure Opco

Bharti Airtel and Vodafone Idea have divested their entire stake in FireFly Networks, marking the end of FireFly's status as a joint venture between the two companies.

FireFly Networks was established in 2014 as a joint venture between Bharti Airtel and Vodafone Idea to provide WiFi services in India. FireFly operates as a vendor and operator-neutral company that deploys a neutral network shared by telecom and internet providers.

The companies have entered into Share Purchase Agreements (SPA) with Manipura Digital Infrastructure Opco, based in

Singapore, for the transfer of their respective stakes in FireFly.

The divestment involves the transfer of Bharti Airtel's and Vodafone Idea's 50% equity stake each in FireFly Networks. The consideration for this transfer amounts to Rs 60.47 million for each company. The completion of this sale is contingent on the fulfilment of closing conditions and is expected to occur within 45 days from the date of the agreement, signed on 4 November.

"Upon transfer of its stake, Firefly would cease to be a Joint Venture of the Company," said Bharti Airtel and Vodafone Idea (Vi) in statements.

BITS Pilani and Airlinq collaborate on 5G and IoT

BITS Pilani has launched a collaboration with Airlinq to drive innovation in 5G and IoT. This partnership is part of the '5G Use Case Labs,' recently launched at the India Mobile Congress 2023 and supported by the Department of Telecommunications (DoT) in India.

"This collaboration with Airlinq is a testament to our commitment to cutting-edge innovation and academic-industry partnerships. Our mission at BITS is to empower our students and faculty to shape the future, and this collaboration allows us to do just that," said prof. V Ramgopal Rao, vice chancellor of BITS Pilani. "Together, we aim to not only advance our understanding of these transformative technologies but also to provide invaluable real-world experiences for our students. This partnership exemplifies our dedication to pushing the boundaries of knowledge and fostering the next generation of tech leaders."

Airlinq will collaborate with BITS to design and implement use cases in areas like urban traffic safety.

This will involve utilising low-latency V2V and V2X communications to enhance the experience for drivers, pedestrians, emergency responders, and others that share the roadways.

"We are committed to unlocking the boundless potential of disruptive and new-age technology. We are excited about our partnership with BITS Pilani, an institute known for its research and innovation, and look forward to pioneering advanced 5G technology solutions that will revolutionize industries and redefine the way our increasingly interconnected world collaborates and communicates to improve lives," said Ankit Taparia, VP at Airlinq and also an alumnus of BITS Pilani.

Indosat reports 24% yoy EBITDA growth

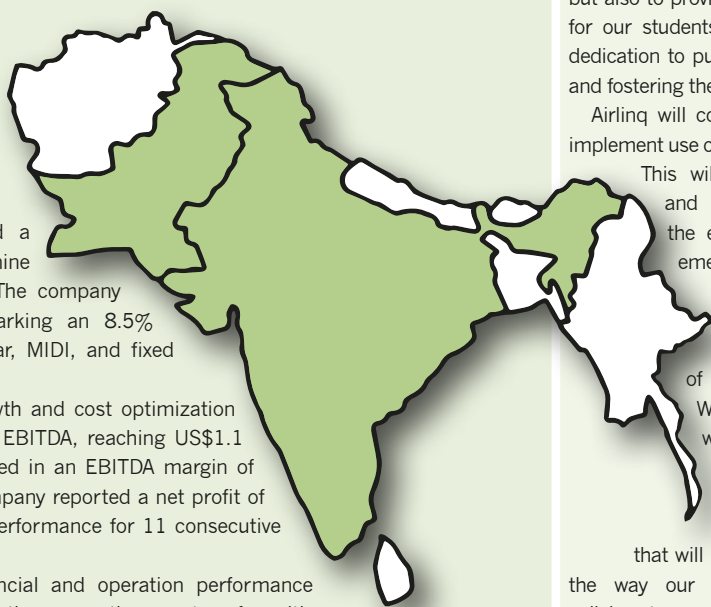
Indosat Ooredoo Hutchison has reported a strong financial performance for the nine months ending on 30 September 2023. The company generated US\$2.4 billion in revenue, marking an 8.5% year-on-year increase, driven by the cellular, MIDI, and fixed telecom businesses.

Indosat said that a combination of growth and cost optimization has led to a 24% year-on-year increase in EBITDA, reaching US\$1.1 billion in the first nine months. This resulted in an EBITDA margin of 46.6%, reflecting a 5.8% increase. The company reported a net profit of US\$179.5 million, maintaining a positive performance for 11 consecutive quarters, setting a new record.

"We are pleased to record robust financial and operation performance during 9M23, including delivering an eleventh consecutive quarter of positive net profit," said Vikram Sinha, president director and CEO of Indosat Ooredoo Hutchison. "Our performance has been driven by our commitment to excellence, a meticulously planned go-to-market strategy, and our unwavering focus on delivering a marvelous experience for customers. Indosat's scale and performance are enabling us to make real strides forward in delivering on our larger purpose to connect and empower the people of Indonesia by accelerating the nation's digital transformation."

Indosat has reported a 16.5% year-on-year increase in data traffic, totalling 10,957,999Tb. Additionally, the telco highlighted that it has further strengthened its 4G network in the Nusa Tenggara region of Eastern Indonesia, now reaching over 80% of the population throughout Nusa Tenggara.

With the addition of network transmitters that have doubled mobile internet capacity compared to last year, Indosat is continuing to expand its network into underserved rural areas in Eastern Indonesia as it strives to bridge the digital divide. Indosat also highlighted that its total 4G BTS count increased by 34.9% year-on-year, reaching 172,000 4G BTS.



Singtel's profits up due to one-off gain

A one-off gain drove Singtel's profit up in its fiscal H1 2024, which ended on 30 September, with its mobile units registering gains.

Group CEO Yuen Kuan Moon said that Singtel had made steady progress in a strategic reset over the past two years.

In addition to creating a strong foundation for the future, Singtel is focused on "rapidly scaling up our growth engines," said Kuan Moon, citing an expectation that a deal with KKR would accelerate an expansion of its ASEAN data centre business.

Net profit attributable to shareholders rose 82.6% year-on-year to SGD2.1 billion on an exceptional gain from an integration of IndiHome with Telkomsel. Revenue fell

3% to SGD7 billion, with weakness in the enterprise business offsetting gains in mobile and other business units. Regional associates' pre-tax profit contributions rose 3% to SGD1.2 billion, with the number affected by a SGD66 million currency loss due to the strength of Singapore dollar.

Domestic mobile service revenue grew 2.3% to SGD640 million and equipment sales fell 5.4% to SGD252 million. Prepaid subscribers grew 4.2% to 1.4 million and post-paid 3% to 3 million. Post-paid ARPU was flat at SGD32 and prepaid fell 10.1% to SGD12. Average monthly data usage rose 8.6% to 10Gb. Sales in its Digital InfraCo unit grew 12.6% to SGD203 million and 8.8% at ICT arm NCS to SGD1.4 billion.

GSMA: Indonesia's 5G spectrum too costly

The GSMA claims that Indonesia stands to lose US\$14 billion in GDP gains over the next six years if it doesn't rethink its 5G spectrum pricing in the next auction.

The Ministry of Communication and Information Technology (Kominfo) is planning to award several frequency bands over the next two years, including 700MHz, 2.6GHz and 3.5GHz, as well as mmWave frequencies in the 26GHz band. That would more than double the current total supply of mobile spectrum.

A new report from GSMA Intelligence points out that estimated annual spectrum costs for mobile operators in Indonesia have increased more than fivefold since 2010, mainly due to auction-related payments and spectrum fees associated with licence renewals. Meanwhile, average revenue per unique mobile subscriber dropped 48% over the same period. The report estimates that annualised spectrum costs to recurring cellular revenue is currently at 12.2%, compared to the APAC and global median values of 8.7% and 7.0%, respectively. This could hamper the ability of Indonesian operators to meaningfully invest in 5G infrastructure, which will slow down rollouts and result in poor customer experiences.

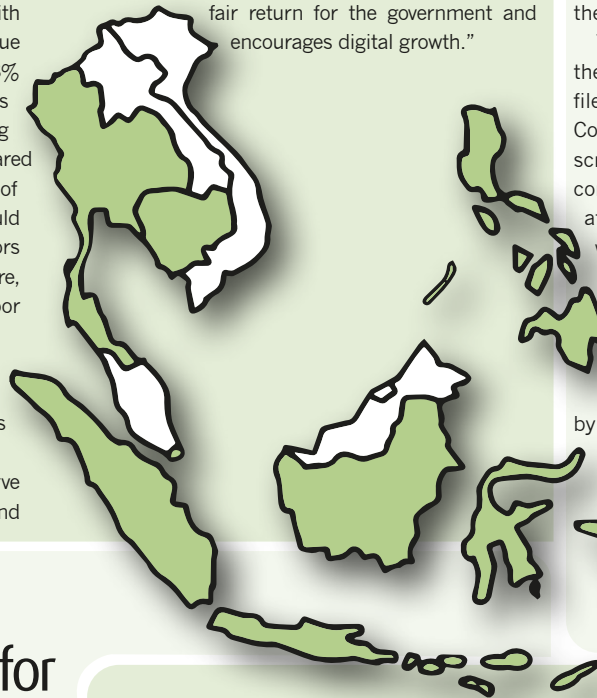
The country could lose IDR 216 trillion in GDP between 2024-2030 if it prices 5G spectrum similar to the previous spectrum auction.

The report urges Kominfo to lower reserve prices below estimates of market value and

adjust the way it calculates annual spectrum fees to provide long-run incentives and avoid disproportionate increases in costs that aren't aligned with market conditions.

The GSMA also recommends that Kominfo come up with a clear and comprehensive spectrum roadmap that accommodates current and future needs, particularly for mid-band spectrum.

"According to our forecasts, 5G will reach 80% of the population by 2030," said Julian Gorman, head of Asia Pacific, GSMA. "For 5G to succeed in Indonesia, the government should focus on the right enabling policies, including spectrum supply and pricing. This requires a well-crafted regulatory framework for a successful auction that delivers a fair return for the government and encourages digital growth."



NBTC faces new TrueDTAC merger lawsuit trouble

Thailand's Supreme Administrative Court has ruled that a consumer watchdog group can proceed with a lawsuit against the National Broadcasting and Telecommunications Commission (NBTC) over its approval of the True-DTAC merger.

In March 2023, the Foundation for Consumers sued the NBTC over an October 2022 resolution in which it said that the regulator had no authority to approve or disapprove the merger of True Corp and DTAC. In that resolution, the NBTC acknowledged the deal and issued remedy measures.

The Foundation for Consumers – which says the True-DTAC merger is harmful to consumers – filed a complaint with the Central Administrative Court on March 8, seeking a court order to scrap the NBTC resolution. The CAC rejected the complaint on the grounds that it had been filed after the statutory deadline for such complaints, which must be filed within 90 days of an NBTC resolution.

However, the Supreme Administrative Court has now ruled that the foundation had good legal standing because it represents the rights of consumers directly impacted by the merger.

The court also ruled that the CAC could still hear the case despite the deadline expiry because telecoms is a basic necessity, and the merger could potentially have a significant impact on consumers by harming free and fair competition.

CamGSM clears regulatory hurdles for sustainability bond

CamGSM PLC has cleared two key regulatory hurdles to listing its planned US\$20 billion sustainability bond in November.

CamGSM has received 'approval in principle' from the Securities Exchange Regulator of Cambodia (SERC) for its sustainability bond listing eligibility. It also received the same approval in principle from the Cambodia Securities Exchange (CSX) on 28 September.

The operator plans to issue its sustainability bond of up to US\$20 million with a maturity of 10 years, effective early November 2023. CamGSM intends to use the money earned from the bond to fund network expansion and pay off existing debts.

CamGSM is still negotiating the interest rate and the creditors for the bond, which is being underwritten by Royal Group Securities. If everything goes according to plan, CamGSM would become the first issuer of a sustainability bond in Cambodia.

Globe Telecom grows revenues, drops profits

Globe Telecom hailed revenue growth in its mobile business, but also reported a profit drop in the first nine months of the financial year.

Profits fell by 27% from PHP26.46 billion to PHP19.29 billion mainly due to increased depreciation expense, a non-operating charge, and the same period last year seeing a boost from the partial sale of Globe's data centre business. Excluding the gain, net profit loss would have been down by 11% year-on-year to PHP14.8 billion.

Total revenue increased by 3% to PHP133.8 billion as mobile service grew by the same rate to PHP83.2 billion, offsetting a 2% decline in fixed line and home broadband sales to PHP33.8 billion.

Mobile voice revenue dropped by 11% to PHP10.2 billion and SMS by 10% to PHP6 billion. Prepaid ARPU grew by 25% to PHP121, meanwhile post-paid was flat at PHP848. Capex was cut by 27% to PHP54 billion as the operator

minimises expenditure.

Globe rolled out 833 new base stations and reported 716 were 5G sites. It also upgraded 5,395 sites to LTE. Globe recorded 5.2 million 5G devices on its network in September.

"Our third quarter results show that our telecom business performance is very much aligned to the guidance we have set. On the other hand, our pivot to a techco business is showing signs of momentum," said Globe Telecom CEO Ernest Cu. "We are happy that more of the non-telco businesses are contributing to the Group's overall business growth and resilience. We will continue to look for opportunities to thrive amidst the macroeconomic challenges and competition. We believe that our renewed focus on innovation, collaboration, sustainability and service, backed by our unwavering commitment to network excellence are the imperatives that will keep us ahead and will pave the way for a digitally inclusive and prosperous Philippines."

AIS-3BB merger approved

Thailand's National Broadcasting and Telecommunications Commission (NBTC) board has approved the merger of Advanced Info Service (AIS) and Triple T Broadband (3BB), so long as it doesn't raise broadband prices for the next five years.

AIS broadband subsidiary Advanced Wireless Network (AWN) struck a deal in July 2022 to acquire 100% of 3BB, along with a 19% stake in Jasmine Broadband Internet Infrastructure Fund (JASIF). The merger makes AIS the biggest fixed broadband player in Thailand with 4.69

million subscribers, displacing True Corp, which has 3.8 million fixed broadband subscribers.

The NBTC board had already approved the plan in principle. The board said that AWN must maintain its pre-merger fixed broadband price packages for at least five years while also maintaining service quality. AWN also must allow for free competition from smaller players and allow them to lease its network. The board also said AWN needs to invest a minimum of 10 billion baht to extend fixed and fixed wireless broadband services to unserved areas.

Nxtra by Airtel improves PUE by 20%

Nxtra by Airtel has introduced its first sustainability report for the financial year 2023, which highlights the company's performance on environmental, social, and governance (ESG) parameters, targets, commitments, and the progress it has achieved thus far.

Operating in over 120 locations, Nxtra specialises in designing, constructing, and operating one of India's most extensive networks of hyperscale, core, and edge data centres (DCs).

Nxtra recently became the first data centre company in India to adopt hydrogen-ready fuel cell technology with low carbon emissions in collaboration with Bloom Energy. The company has set an ambitious target of achieving Net Zero emissions by 2031. Nxtra is actively exploring various innovative energy solutions to power its data centres and working on ways to create a more sustainable future.

"At Nxtra, our commitment to be sustainable is at the heart of our operations. We have also designed our workplace to be inclusive and safe and have imbibed transparent governance

standards and environmental conscientiousness that is endorsed by every employee," said Nxtra in a statement.

Over the past five years, Nxtra has witnessed a 20% improvement in Power Usage Effectiveness (PUE), with a further target to reduce PUE by 10% by 2025. In FY 2022-23, the company saved 109,612 tCO2e emissions by sourcing renewable energy for its data centres. Airtel consumed 156,147MWh of renewable energy in its operations, with a 33% penetration of renewable energy for core data centres. Airtel also reported a 5% reduction in operational emissions across Scope 1 and 2 from the FY21 baseline and maintained a 'zero' incident rate and worst potential severity for two consecutive years.

Nxtra by Airtel sourced 98% of its procurement from Indian suppliers. It has also doubled its female workforce, increased the number of women in management by 1.5 times, and achieved a 22% gender diversity at the board level.

Summit Towers to acquire 2,000 of Banglalink towers

Banglalink has reached a deal to sell about a third of its tower assets to Summit Towers for BDT11 billion, with plans to use the proceeds to service its financial commitments and upgrade its digital capabilities.

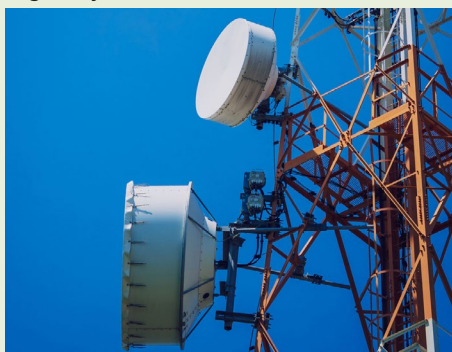
Banglalink will transfer more than 2,000 towers to Summit Towers, which is majority-owned by Bangladesh-based Summit Communications Group. The deal includes a long-term service partnership.

Veon group CEO Kaan Terzioğlu said that the agreement will enable Banglalink to focus on its core business and address "demand in entertainment, education, healthcare and financial services."

Banglalink CEO Erik Aas added that the partnership will allow it to focus resources on

bridging the digital divide for all.

The transaction requires approval by the Bangladesh Telecommunication Regulatory Commission.



NOW Telecom's mobile license renewed

The National Telecommunications Commission (NTC) has renewed NOW Telecom's license to operate mobile services using the 800MHz band, keeping its hopes alive to crack the market's mobile sector.

Mel Velarde, chair of NOW Telecom's parent company NOW Group, said that the license renewal was a "much needed boost" for its plans to enter the Philippines mobile market to take on incumbents PLDT/Smart and Globe Telecom, and newcomer DITO Telecommunity. Velarde also said the renewed 800MHz licence would "strengthen the communications security and connectivity to vital critical infrastructures in the country."

NOW Telecom plans to establish critical communications infrastructure for sectors such as dams, defense, industrial bases, government facilities and power plants that require secure, reliable and robust communications systems using only trusted equipment. According to local media, NOW Telecom has been talking with the Philippine military, the Cybersecurity Investigation and Coordination Center (CICC), and the US Department of Homeland Security to identify which sectors would benefit from critical comms infrastructure.

Pakistan Telecommunications Authority introduces SIM termination charges

Pakistan's telecoms regulator has enabled operators to begin charging a SIM termination charge in January 2024 to ease the abuse of free SIM cards and combat the use of illegal activities on networks.

The Pakistan Telecommunication Authority (PTA) said that the 'SIM disowning charge' will apply to SIM cards that have not been retained for over six months and operators can charge customers up to PKR200 (US\$0.70). Subscribers are encouraged to return 'unnecessary' SIM cards free of charge before 31 December.

"With this decision, the PTA stays committed to national safety and security while ensuring uninterrupted quality services to all telecom consumers," said the PTA in a statement.

India's smartphone market flat

India's smartphone market recorded a flat year-on-year (YoY) growth with 44 million units shipped in the third quarter of 2023. July and August showed single-digit growth due to early festive stocking, but September experienced the lowest shipments since 2019 due to dipping demand and high costs.

During the third quarter of the year, the average selling price (ASP) rose 5% quarter-on-quarter (QoQ) and 12% YoY to US\$253. The significant increase in 5G smartphone shipments, reaching a record 58% market share with a total of 25 million units, can be attributed to the availability of more affordable and discounted 5G devices from suppliers. The 5G ASP fell 9% YoY to USD 357. The 5G shipments in Q3 2023 were primarily from the mass budget price group (USD 100 to USD 200), making up 52% of the total shipments.

"A swift uptake in affordable 5G smartphone shipments signals bullish sentiments and success of affordability efforts of the vendors. We should expect the previous generation of premium smartphone models to be in high demand this festive season, made affordable by various offers and upfront discounts across channels," said Upasana Joshi, research manager, client devices, IDC India.

Despite a sluggish holiday season, the demand for smartphones has been driven by micro-financing and affordability initiatives. There remains a concern that, post-Diwali, demand might experience a decline, which could lead companies to grapple with excess inventory challenges, impacting the overall outlook for 2023, which is anticipated to be flat or show low single-digit growth.

In 2024, inexpensive 5G and foldable phones may hit the market, but inflation and longer refresh cycles may limit annual growth.



Talking satellite

Carlo Agdamag, space and spectrum policy manager, Access Partnership



WRC-23 satcoms issues at a glance: Asian perspectives

The World Radiocommunications Conference (WRC) is undoubtedly one of the most significant events in the telecommunications industry globally. The primary function of this quadrennial event is to review the treaty governing the use of radio frequency spectrum and orbital resources, the allocation of which is a contentious issue due to its scarce and finite nature. As the next edition of the month-long conference unfolds on 20 November in Dubai, UAE, national administrations and industry players are already starting to finalise their strategies on the various agenda items (AI) to be tackled.

WRC agenda items are preliminarily discussed through the various ITU regional organisations, with Asia being under the auspices of the Asia-Pacific Telecommunity (APT). The APT is one of the more interesting regional organisations, given its geographic dispersion and the disparity in the political systems and socioeconomic development of the national administrations that it comprises. As such, many interests come into play, making it difficult to reach a consensus. While there are set rules prescribing the number of administrations required to adopt a common regional position for WRC, the APT tends to adopt a more conservative approach in practice, with unanimity in opinion being the apparent preference.

Given that satellite communications operate on an international basis, the WRC provides a centralised forum for governments and industry to effectively harmonise rules on satellite communications to guide domestic regulatory frameworks. WRC-23 would cover several satellite-related issues, and APT administrations have already come up with their common position on these, especially as they stand to affect the state of connectivity in the region.

Satellite issues in WRC-23

Two agenda items revolve around the use of certain frequency bands by Earth stations in motion (ESIMs) in the fixed-satellite service globally. ESIMs provide broadband communications on moving platforms, such as aircraft, ships, and land vehicles. These allow people to

remain connected through their devices while in transit and are ordinarily outside the scope of terrestrial services, such as being on a commercial flight. The issues to be discussed at WRC-23 aim to harmonise the use of ESIMs in the Ku band (AI 1.15) and expand their use to connect with NGSO space stations in the Ka-band (AI 1.16). These changes have the potential to augment existing services currently being provided by operators, improving the connectivity of users. Currently, APT administrations support maintaining the status quo but are nonetheless open to these proposals, provided that pending issues are resolved. A leading concern is the management of possible interference that might arise from these new services.

The conference also intends to address certain issues that could potentially improve the interaction between geostationary satellite orbit (GSO) and non-GSO systems in light of the latter's exponential rise over recent years. These include issues on orbital tolerances (AI 7A), post-milestone reporting (AI 7B), and aggregate interference to GSOs (AI 7J). On the issue of orbital tolerances, Asia-Pacific jurisdictions support the development of the definition of tolerances of NGSO space stations in the FSS, BSS, and MSS in the context of applicable ITU regulatory procedures. They are not in favour of overregulation or regulatory methods that are too stringent or inflexible to allow the operation of new and existing satellites without the possibility of making adjustments to them. APAC states also support the development of post-milestone procedures for NGSO systems in the FSS, BSS, and MSS. Meanwhile, some differences remain over the determination of interference levels, such as those relating to calculation methods and the compliance method in the event of a breach. As such, no common proposal has been developed for this issue.

In addition to these topics, other equally important issues involving satellites include inter-satellite communications (AI 1.17) and new spectrum allocations for the broadcast satellite service (AI 1.19). APAC countries have already reached a common position on both of these areas.

Prospective issues for WRC-27

The upcoming conference will also decide the agenda for the WRC's next edition in 2027. Various

administrations have proposed possible topics to be covered, with 12 issues pertaining to satellites considered.

One of these proposed conducting studies on a possible worldwide allocation to the MSS for the future development of low-data-rate satellite services within 1.5-5GHz. Similar to the outcome of the narrowband MSS issue for AI 1.18, this proposal has not been supported, citing concerns regarding incomplete and inconclusive studies.

A similar proposal concerns possible new spectrum allocations for MSS below 4GHz. Recognising the lack of adequate terrestrial connectivity in certain areas, mobile satellite systems have been put forward as a means to supplement IMT coverage. Through this planned new allocation for the satellite component of IMT, more spectrum resources could be utilised for the further development and operationalisation of satellite direct-to-handset (DTH) services, enabling direct communication between NGSO satellites and IMT user equipment, such as smartphones. Its lead proponents in Asia include Japan and China, as well as Pacific Island states like Papua New Guinea, Samoa, and Vanuatu, which often rely on satellite communications for reliable connectivity. While discussions on the issue have been productive, APAC administrations have been unable to agree a common position due to a lack of time to discuss other salient points, including the specific frequency bands to be covered. This topic is among the pending issues to be discussed by APAC countries during their coordination meetings on the sidelines of WRC-23.

Way forward

The satellite-related issues to be tackled at the upcoming WRC will have wide-ranging repercussions on the state of connectivity worldwide, including in the Asia-Pacific region. However, the increasingly agile development of technological systems necessitates regulatory frameworks that can cope with these changes and innovations. As such, while the telecommunications industry stands to resolve a number of topics at WRC-23, efforts to achieve true universal connectivity will continue.

IoT: energy guzzler or sustainability-multiplier?

By Dr. Philipp Schulte, CEO of G+D Mobile Security

It's hunger for energy is a pressing issue in these environmentally conscious times. Data centres are just as much in the spotlight as the booming Internet of Things. Conversely, IoT can also make an important contribution to improving sustainability.

The age of massive IoT has arrived. There are many reasons for this, including the simplified hardware design of IoT devices, global network connectivity, high security standards and centralized, digital management of devices, which eliminates the need for manual onboarding.

The implementation scenarios for IoT solutions are therefore almost unlimited. They range from connected vehicles, smart grids and smart buildings to complex smart city applications. These IoT dynamics have implications for environmental and climate protection. It is clear that the increasing number of IoT devices has a negative impact on CO2 emissions. At the same time, IoT can also have a positive impact on sustainability.

More sustainability thanks to IoT

As public attitudes and policies change, companies have started incorporating ESG (Environment, Social, Governance) and SGD



(Sustainable Development Goals) criteria into their corporate strategies. IoT solutions provide valuable support, for example by monitoring and analyzing the carbon footprint of individual industrial activities. Most importantly, the massive IoT infrastructure itself must become more sustainable. For example, IoT devices such as sensors and tracking systems in logistics or production facilities typically use embedded eSIMs rather than traditional SIM cards to ensure connectivity. They do not use plastic frames and are typically managed centrally. This eliminates packaging waste and transportation costs. A study conducted by Fraunhofer IZM for G+D confirms the environmental friendliness of eSIM solutions (1). The life cycle assessment shows that the eSIM emits 46 percent less CO2 than SIM cards.

The next evolutionary step is the iSIM, or iUICC (integrated universal integrated circuit card). This eliminates the SIM-specific hardware component and runs the SIM operating system

in its own secure environment on the baseband controller. Overall, the iSIM is significantly smaller and more power-efficient than previous SIM generations. It has been commercially available on the market since 2021 and will initially co-exist with eSIM technology: eSIMs for broadband IoT, iSIMs for secure connectivity in narrowband IoT and LTE-M applications. Over time, however, iSIM will become the standard.

Environmental protection, sustainability and resource conservation have become key business objectives. The IoT industry has an important role to play. On the one hand, it must make IoT devices more efficient, with iSIM technology leading the way. On the other hand, the IoT can also drive societal change towards sustainability through digital metering of energy consumption, implementation of disruptive applications such as intelligent traffic management systems, or in the larger dimensions of a smart city. The IoT therefore has a key role to play in shaping a greener and more efficient future. ■

((1) cf.: https://www.izm.fraunhofer.de/de/news_events/tech_news/unabhaengige-studie-bestaetigt-die-esim-als-umweltfreundliche-sim-loesung.html) and copyright.

Hybrid satellite solutions to help airlines meet passenger demand for in-flight connectivity



Reza Rasoulia, vice president, Hughes

Commercial aircraft serving the cities of Asia, Africa, and the Middle East fly some of the longest non-stop flights in the world. Passengers traveling from Singapore to New York spend over 18 hours in an airplane cabin. From Dubai to Auckland and from Johannesburg to Atlanta are both around 17 hours in the air. What would you do on a trip that long? Chances are, you'd want to get online for some, if not most, of the time in the air.

One survey found that 97% of airline passengers use their personal devices while in the air for everything from work and social media to entertainment. The bottom line is that passengers today expect in-flight entertainment and connectivity when they fly. On-board WiFi is a necessity for many passengers and, therefore, a competitive differentiator for airlines, too. However, the challenge for airlines is that aircraft WiFi networks depend on fixed-bandwidth satellite connections, and as more passengers sign on – some connecting with multiple devices – the networks become slower and slower for all users, to the point that many applications won't even work. This is frustrating for passengers, especially those who have paid extra for in-flight WiFi.

The geostationary vs. low Earth orbit satellite landscape

In efforts to satisfy the growing demand for in-flight connectivity, global satellite operators launch new, more powerful spacecraft to provide additional broadband. To

date, most in-flight connectivity has relied upon satellites in the geosynchronous orbit (GEO) around the Earth. These spacecraft orbit at more than 22,000 miles (36,000km) from Earth. A new generation of satellites operate in low Earth orbit (LEO), between 600 and 1,000 miles (960 and 1,600km) above the planet. Because the LEO satellites are closer, their signal can be picked up with a smaller antenna than a GEO signal. The shorter distance means there is less lag time, or latency, in a connection, an important factor in applications such as streaming and video conferencing.

The two types of satellite connectivity – GEO and LEO – both deliver high-speed bandwidth from space. GEO satellites bring capacity density over busy airport hubs and routes. LEOs bring worldwide coverage – even over oceans and the polar region. And, of course, there's a difference in the service latency, which is meaningful for some applications, such as when using a VPN. But airlines don't have to choose which type of satellite connectivity to use in meeting passenger expectations for in-flight WiFi. They can use both.

Meeting in-flight WiFi demand with a hybrid satellite solution

Demand for in-flight connectivity is only going to grow, and a recent report by NSR predicted that it will grow more quickly in Africa, the Middle East and Asia than in any other parts of the world. NSR projects that these three regions will account for nearly

half of the revenue growth for in-flight connectivity over the next decade, primarily because the huge populations that are still underserved with airline flights and because there is currently less leisure travel among the populations than in Europe and the Americas.

The challenge for airlines is being able to tap this growing revenue opportunity by providing reliable in-flight WiFi to the passengers who are willing to pay for it. With both a GEO and a LEO connection, plus the necessary intelligent networking software, an airline can deploy a 'hybrid' network solution. A dual connection offers more bandwidth for passengers connecting to the internet and improves reliability of those connections for email and other business and entertainment applications. In short, with a GEO and LEO satellite solution, airlines will be able to offer passengers better and more reliable in-flight WiFi than what is currently possible with GEO-only or LEO-only connections.

What's particularly exciting about a hybrid in-flight connectivity

service is that airlines can preserve the considerable investments they've already made in GEO solutions. The prospect of 'ripping and replacing' GEO antennas and equipment from commercial aircraft is a daunting – and expensive – one. Especially for an airline that has outfitted its fleet with a GEO satellite solution. Instead, airline executives with existing GEO-only receivers on their aircraft can look at hybrid options using LEO to preserve their GEO investments while enhancing their passenger experience at the same time.

NSR predicts that the number of satellite receivers on commercial and private aircraft will increase from 71,000 currently to over 145,000 units by 2032, a growth rate of more than 7% each year. Fed by passenger demand, the aviation industry needs to connect airplanes to satellites that are more technically advanced and more powerful. Airlines need to look for the best solutions, ones that take advantage of all the satellite industry has to offer. ■





FWA – groundbreaking tech or fibre stopgap?

FWA has been making the headlines in recent years as an alternative connectivity solution to shore up the digital divide. However, reports suggest that it may be little more than a stopgap...

Fixed wireless access (FWA) is taking the world by storm, and southern Asia is no exception.

The GSMA reports that as of March 2023, 17 operators in eight Asia Pacific countries offered 5G FWA services. Markets where the fixed broadband technology mix is skewed towards xDSL, such as Australia, and those with low total fixed broadband penetration, such as the Philippines, are expected to lead the growth of 5G FWA in the region.

Need for speed

We live in an age where demand for higher connectivity speeds is growing at an unprecedented rate; 5G is expected to play a key role.

“The demand for speed is driven by the increasing need to support advancements in digital content, such as 8k video streaming, making higher broadband speeds essential to meet these demands effectively,” says Yisrael Nov,

EVP, sales, Parallel Wireless. “Video streaming transitioned from 4k to 8k resolution - requiring a fourfold increase in broadband speed to effectively manage the augmented data volume. Users engaging in 8k streaming experience increased bitrates (data transfer rates) to facilitate content downloading while maintaining superior quality. As a result, the increase in data requires more bandwidth to support it.”

The GSMA data predicts that there will be 1.4 billion 5G connections in Asia Pacific by 2030, accounting for 41% of all mobile connections. The region’s operators are investing US\$259 billion on their networks – mostly on 5G deployments - over 2023-2030.

FWA vs fibre – no competition

Southern Asia has a broad range of topology – from dense, urban cities to sparsely populated remote and rural villages, among others. According to the

ITU, more than 25% of the population remains without internet access in several southern Asian countries, due to factors including environmental, demographics, infrastructure development, and economic conditions. The spread of FWA – in comparison to competing technologies like fibre and satellite – depends to a significant level on these factors.

FWA is being touted as an affordable solution for those in lower income and underserved regions, in particular: “FWA tends to be more cost-effective and faster to deploy than fibre, especially in areas with limited fixed infrastructure. FWA can be a solution for regions where laying fibre optic cables is challenging due to geographical constraints, regulatory hurdles, or high costs,” says Richard Pak, CEO, Curvalux.

In the competition with fibre, the latest 5G and WiFi 6 and 7 advances mean that FWA can offer a viable alternative, which is continually improving.

Business	Population (millions)	Internet users (millions)	Internet penetration (%)	Population without internet access (%)
Afghanistan	39.8	8.6	21.6	78.4
Bangladesh	166.4	116.7	70.2	29.8
Bhutan	0.8	0.5	64.9	35.1
India	1390.0	1015.3	73.1	26.9
Iran	84.9	76.7	90.3	9.7
Maldives	0.5	0.4	91.6	8.4
Nepal	29.7	20.3	68.4	31.6
Pakistan	225.2	101.2	44.9	55.1
Sri Lanka	21.4	19.5	91.1	8.9

Source: Facts and figures 2021 - ITU

However, Ron Ng, chief business officer, Curvalux, reports that “the presence of fibre may influence pricing and competition in the broadband market. FWA providers may need to offer competitive pricing and services to attract and retain customers in areas where fibre is well-established.”

Nevertheless, FWA offers a substantially faster time to market than competing technologies. Fibre infrastructure, for example, is labour intensive, time consuming, and faces regulatory challenges including zoning, right-of-way approval and local permits, as well as requiring the installation of conduits and utility poles. FWA can also serve as a solution in areas where the ‘last mile’ connectivity is the main challenge, says.

Despite the overarching benefits of FWA, fibre remains Asia Pacific’s leading broadband technology of choice – by a long shot. As per S&P Global Market Intelligence, the region had 596.5 million fibre broadband connections in 2022 – expected to grow to 726 million by 2027 – with a 50.7% household penetration rate. In contrast, FWA subscribers for the region numbered 9.3 million, while satellite had 237,000 subscribers.

Monetising the network

While network modernisation and the move to 5G remains a priority, the matter of monetisation is becoming increasingly pressing amidst stalling core service revenues. According to the GSMA, 5G FWA has ‘the potential to drive incremental revenue opportunities for operators.’

FWA will be of particular relevance in markets where fixed broadband is still based on DSL technologies, and in markets with low overall fixed broadband penetration, like the Philippines – in May, Globe Telecom reported that it generates 25% of its home broadband revenues from FWA. Indonesia and Thailand will also be key markets for 5G FWA, says the GSMA.

So how exactly can FWA help monetise the network?

On the quest to meet rapidly expanding demands for high-speed connectivity, FWA availability naturally represents an excellent money-maker for operators, since broadband enables users to consume more data, increasing revenue from data usage. Moreover, “as more devices and applications require high-speed internet, the demand for data is growing; operators can capture a larger share of this growing market by providing

FWA broadband,” adds Pak.

FWA can also help mobile operators better utilise their existing infrastructure, with cell towers and backhaul networks being put to additional task to deliver additional services. By providing broadband access to areas where it might be difficult or expensive to lay traditional wired infrastructure, operators can use their resources more efficiently.

With these expanded service offerings, “MNOs can offer additional broadband services to their customers with FWA solutions,” says Ng. “MNOs can bundle their existing mobile offerings with home and business broadband services. This diversification of services can increase revenue streams and customer loyalty. It is also proven that customers with bundled products may be more likely to stay with the provider. This can help retain customers and reduce the revenue loss due to customers churning to other providers.”

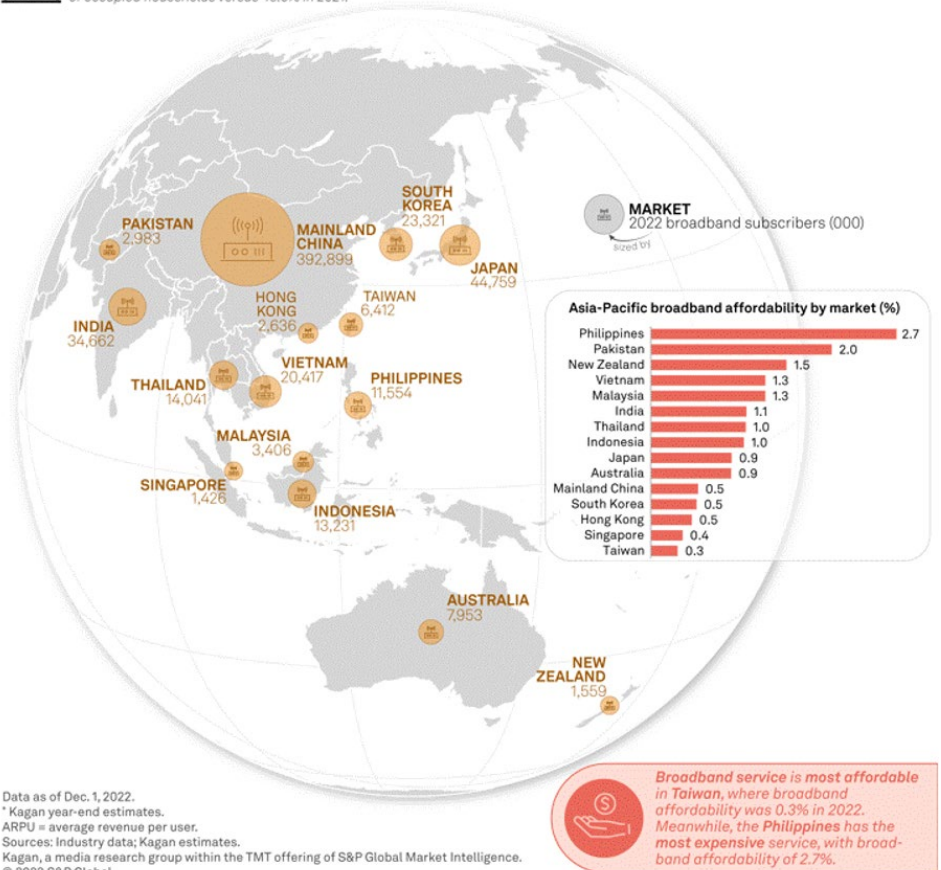
When it comes to spectrum challenges, which remain a topic of much discussion the world over, FWA operating on non-mobile spectrum – like unlicensed 5GHz – can also provide a handy offloading solution for mobile networks.

“It can help alleviate congestion in heavily loaded mobile areas by offloading some data traffic onto the fixed wireless network, thus improving mobile users’ overall quality of service,” says Ng. “Other than this, non-mobile spectrums fee to the regulator is typically much cheaper than mobile spectrums.”

Finally, in the continual search for new sources of revenue, “MNOs can explore partnerships with WISPs or offer wholesale access to their network infrastructure. This can create additional revenue streams by selling access to their existing network to other providers or entering into revenue-sharing agreements,” adds Pak.

Broadband market in the Asia-Pacific region, 2022*

With 597 million subscribers connected to fixed broadband in 2022, broadband penetration in the region reached 50.7% of occupied households versus 48.6% in 2021.



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Richard Pak, CEO, Curvalux

The role of AI

AI is expected to significantly impact FWA networks in the future. The benefits are comparable to those for other wireless communications technologies, namely dynamic spectrum management, predictive maintenance, resource allocation, security and threat detection, capacity planning, etc.

“AI can be crucial in optimizing FWA networks. Machine learning (ML) algorithms can analyze real-time network data to identify congestion points, signal interference, and other performance issues,” says Pak. “AI can then dynamically allocate resources, adjust beamforming, and optimize frequency allocation to enhance network performance and deliver consistent, high-quality connectivity.”

AI can also assist in dynamic spectrum management. By analysing how different frequency bands are utilised, AI can allocate spectrum resources more efficiently, ensuring that FWA networks operate at peak performance and avoid interference.

Importantly for a relatively new technology, AI/ML in 5G FWA can be a major boon for enhancing the user experience: “AI can analyze user behaviour and preferences,” outlines Ng. “FWA providers can use AI to offer personalized services, optimize data plans, and provide better customer support through chatbots and virtual assistants.”

It can also be deployed to detect disruptions that impact on the network, and automatically adjust parameters to maintain consistent, high-quality service, reducing customer complaints and churn.

“The impact of AI on FWA networks will depend on the extent to which operators adopt and implement AI technologies, the quality of data available for analysis, and the regulatory environment,” says Pak. “As AI continues to evolve and mature, it is expected to become an integral part of FWA network management, enhancing performance, efficiency, and the overall user experience.”

What’s next for 5G FWA?

FWA services are forecast to gain traction across southeast Asia for the foreseeable. ABI Research reports that the market for southeast Asia is expected to reach 7.8 million subscriptions - a compound annual growth rate (CAGR) of 13% - and \$2.23 billion in revenues by 2028.

By 2024, 5G FWA will likely be more widely available. Service providers will expand their 5G FWA coverage to reach more urban, suburban, and rural areas.

Indeed, 5G networks will continue to evolve, offering even higher speeds and greater capacity, which will allow 5G FWA to compete more effectively with wired services, supporting more demanding applications like 4k/8k video streaming, augmented reality (AR), virtual reality (VR), and IoT.

“5G network infrastructure and technology improvements will increase reliability and network stability, reducing latency and ensuring a more consistent user experience,” says Ng. “Dynamic spectrum sharing will become more prevalent, allowing 5G FWA networks to share spectrum resources with other wireless systems, optimizing spectrum utilization and coexistence.”

And with better radio network capabilities and core network evolution, 5G FWA will expand into a wider range of applications like critical communications and IoT. Pak believes that, by next year, there will be a broader ecosystem of 5G FWA devices, including advanced CPEs, routers, and modems, and more devices will support 5G, including IoT and smart home appliances.

Notably, edge computing is expected to play a more significant role in 5G FWA networks, reducing latency and enabling real-time processing for applications like IoT, smart


Ron Ng, chief business officer, Curvalux

cities, and autonomous vehicles. “5G networks will support network slicing, allowing providers to allocate specific network slices for different services, ensuring quality of service for various applications and industries,” explains Pak.

Despite intense competition with fibre, the future of 5G FWA across southern Asia looks rosy. The integration of AI and ML into 5G FWA network management will enable operators to more efficiently allocate resources, allow predictive maintenance, and enhance user experiences – all positives for sustainability commitments. With more options to connect the underconnected and unconnected in some of the world’s most diverse terrain, 5G FWA is here to stay. ■

The Filipino case...

ABI Research forecasts that most future FWA movement is expected to be concentrated in markets like Indonesia, the Philippines, and Malaysia, which have fixed-line broadband penetration rates below 50%. In contrast, there’s less demand for FWA in places with more widespread fibre availability like Thailand and Vietnam. Indonesia and the Philippines are also keen on FWA, both being archipelagos with challenging terrain. Operators like Telkomsel, PLDT/Smart and Globe Telecom have already launched 5G FWA services.

However, in the Philippines, FWA subscriber numbers are actually falling. In its 1Q 2022 financial statement, Globe Telecom reported 2.4 million FWA subscribers – a year later, that had fallen to 1.2 million. PLDT/Smart also reported a drop in FWA subscribers for the same period. Both reported an increase in fixed-broadband subscriptions.

There are several potential factors to account for this, which include operators selling off tower assets, impacting their ability to offer FWA services; and the fact that fibre rollouts are still ongoing, supporting the often-touted notion that operators continue to see FWA as a placeholder until fibre is available.

“Offering a service that is prepaid and, therefore, on demand with no lock-in period, is working to connect the unconnected in an attractive and different way,” says Sarah Young, southeast Asia digital transformation research analyst, ABI Research.

Whether FWA ends up a stopgap for fibre or a viable broadband alternative may depend on the progress of 5G rollouts – especially mmWave 5G, which is the next step for 5G FWA. Telkomsel is planning to roll out mmWave 5G FWA services shortly.

Indeed, says Yisrael Nov, EVP, sales, Parallel Wireless, believes that operators must pivot towards mmwave to utilize available spectrum, since there is scarcity and capacity constraints in the lower band. Regulators must allocate spectrum in larger quantities at the higher end of the band to support the heightened throughput.

“The challenges with 5G technology arise in the context of distance radiation, prompting operators to invest in smart and innovative antennas to support the mmwave frequency at an affordable cost,” adds Nov.



Powering the towercos of tomorrow

As mobile generations advance across southern Asia, tower power demands grow to extraordinary levels – how can this best be managed?

The technologies utilised in the tower sector have advanced in leaps and bounds in recent years in line with the expansion of new mobile generation rollouts. As we witness the technological shift from 3G, 4G, and 5G, it's essential to grasp the substantial increase in power demand, says James Gray, director of telcom strategy, PowerX.

"If you previously had 300 sites to support 3G, you would now require around 700 sites to meet the power demands of 4G. The power requirements surge as well. A 3G site typically consumed up to 3.5Kw, while a 4G site would demand around 6Kw. The introduction of 5G takes it even further, with sites needing 11-12Kw, reflecting a substantial increase in power demand," says Gray.

Macro towers are usually built with enough space for more than one set of equipment on them so they can accept network equipment from a new operator or a technology upgrade easily, as per Matthew Edwards, product director, TowerXchange.

However, "in parts of southeast Asia, you can see areas where 2G, 3G, 4G and 5G are all required for different customer segments, which can overwhelm a tower," says Edwards. "One solution is to phase out 2G or 3G to reduce site load, or to move the 5G network layer to smaller sites like smart poles or small cells. Increasing data usage in places like India mean that sites are becoming more loaded as more network

capacity is required."

This technology growth is placing more pressure on existing – sometimes outdated – cell towers.

"The reality is that the infrastructure that has been put in place and designed for 2G/3G has to pretty much change in flight," says Ani Chiuзан, CMO, PowerX. "The tower design paradigm must shift to better forecasting of telecom load, both in terms of taking growth rate – for subscribers and data – into account, but also designing it with hybrid power solutions in mind."

While grid may be available and stable, energy cost is high, and the infrastructure needs to reduce its footprint on the environment and achieve net zero – so hybrid solutions must be part of the initial design for power.

"It's paramount to use data on historical operations to be able to forecast power demands and utilise assets with better accuracy. Otherwise, it's going to be a guesswork based on manufacturers specifications that don't always meet the reality of the assets and operations," says Chiuзан.

To address this expansion in energy demand, it has become vital to have larger battery backups to support infrastructure during grid outages, as well as an upgrade in power infrastructure. "The focus is on ensuring a stable power supply to meet the heightened power requirements, aligning with the increased energy demands of the evolving mobile technology landscape," adds Gray.

Sustainable power

"The towerco model is inherently sustainable, sharing steel, reducing truck rolls, and investing in renewable energy solutions, making every Gb consumed more efficient. But, if more people use more data, then it can look like the industry is getting dirtier," says Edwards.

Nothing could be further from the truth.

Just 12-14 years ago, sustainability wasn't on the radar for most towercos, with minimal mention in contracts or discussions. The recent shift towards embracing sustainability is now evident, with a clear focus on environmental, social, and governance (ESG) targets. With this shift, it has become easier to integrate renewable solutions into design and operation.

"An essential factor contributing to this shift is the increasing economic feasibility of solar," says Gray. "In the past, solar power was scarcely discussed, largely due to its exorbitant costs, poor understanding, and inefficient specifications. However, the industry has witnessed a transformative change with the emergence of affordable solar solutions in tandem with the introduction of lithium ion batteries. This timely convergence has enabled the development of more compact tower sites, fostering sustainability in the process."

There are numerous benefits gained from the move to renewable energy, including the declining costs of renewables, which significantly impact the economics of tower operations; as well as substantial environmental and ESG advantages.

"The integration of renewables into tower design has presented challenges, but there is a growing recognition of the importance of this endeavour," says Andrew Schafer, CEO, PowerX. "Renewables are steadily moving into the mainstream, primarily driven by the decreasing cost of renewable technologies. This cost reduction is making the deployment of renewables increasingly viable and attractive."

While the incorporation of renewables in tower design may pose challenges, the industry is increasingly recognizing their importance. As they become more cost-effective, tower technology will continue to evolve, driven by a growing emphasis on energy efficiency, environmental considerations, and the need to reduce diesel consumption.

"In Asia, we encounter two distinct scenarios: countries with stable grid supplies and those grappling with significant grid outages," explains Chiuзан. "The latter necessitates automatic consideration of hybrid solutions."

Once upon a time, hybrid models featured grids supported by lead-acid batteries or backup generators which often rely on diesel, perpetuating the use of generators as the default backup power source.

"To strike a balance between efficiency and sustainability, a critical shift is needed in our approach," says Chiuзан. "The initial focus should be on reimagining our design, where hybrid power solutions incorporate lithium-ion batteries for storage, coupled with the generation of green energy from solar as the primary backup option. In this paradigm, we must view traditional models as evolving towards continuous power supply through solar and battery storage for various sites. This evolution comes with the added responsibility of adapting the skill set and training of our workforce."

The future will likely involve the widespread use of intelligent software solutions to manage the intricacies of hybrid/multiple power sources and ensure optimal tower performance.

"The dynamics of the industry suggest a future marked by a more extensive deployment of renewables," adds Schafer. "The efficiency of renewable technologies is expected to improve, and their costs are likely to continue their downward trajectory. This trend positions renewables as an integral component of tower design. As the cost of traditional fuels increases and awareness of their environmental impacts grows, there is mounting pressure to reduce reliance on diesel generators. The rise of solar and other renewable sources introduces complexities related to their intermittent availability. Solar, for instance, relies on daylight and varies from day to day, and season to season. This necessitates a more intelligent approach to power source management."

Intelligent design

The industry is in the process of designing towers that not only stay operational but are also sustainable, aligning with the growing scrutiny and consideration of energy sources. The focus is not just on keeping the towers online - but also on powering them sustainably.

So, how can towercos continue their evolution into a greener, cleaner future?

"Solar and battery have been the biggest stories in telecom energy for several years and they'll stay that way," says Edwards. "The combination of cycling a

lithium ion battery and getting free energy from the sun is hard to beat. In some markets wind adds to the mix as it can provide energy when solar cannot."

Chiuзан agrees that, while solar has begun to stand out as a prominent option, "there is a noticeable surge in experimentation with wind turbines, reflecting the industry's commitment to exploring diverse avenues. The landscape further expands with trials and innovations centred around alternative fuels, including synthetic options."

Indeed, alternative engines and turbines are being developed that can burn clean fuels and reduce emissions. "The most important way to drive forward sustainable development in Asia is getting more capital to towercos and ESCOs to switch away from diesel generators. Networks need to expand but they must expand as cleanly as possible," adds Edwards.

However, the implementation of renewables alone is insufficient: "they must coexist seamlessly with existing infrastructure, emphasizing the importance of technology integration for efficient operation. We underscore the significance of data-led and intelligence-driven technologies," explains Chiuзан. "This approach becomes paramount when managing a complex hybrid power supply, necessitating data-driven decisions at scale. Without this technological overlay, there is a risk of running these assets inefficiently."

The advent of renewables introduces another layer of intricacy to the power source landscape, for which AI-driven software might be considered essential for optimisation. Moreover, "the incorporation of AI aligns with the evolving landscape of time-of-use tariffs and grid pricing while addressing the escalating energy demands driven by the mobile data boom," says Schafer. "The structured grid tariffs offer opportunities for peak shaving through intelligent grid-battery interplay, and the integration of renewables necessitates AI's role in efficient power source management. This transition isn't just about identifying issues, but also about real-time action and autonomous tower control, emphasizing cost reduction and asset optimization as key objectives in the industry's future."

Emerging technologies play a pivotal role in enhancing hybrid power sources; however, "without this embrace of advanced technologies, there is no guarantee that investments in alternative power options will yield the desired returns," asserts Chiuзан. "By emphasizing the role of data and AI in automating operations, we strive to ensure the efficiency and

effectiveness of these investments in the evolving landscape of alternative power sources."

According to Schafer, the growing recognition of the pivotal role that AI-driven software can play in managing and optimizing power sources is significant: "this realization underscores the importance of implementing intelligent systems to ensure power sources are used in the most efficient manner."

Gray agrees that AI is poised to revolutionize tower management, particularly in challenging regions like parts of Asia: "in bustling cities like Manila and Jakarta, maintaining SLAs can be difficult due to logistical complexities. AI-powered management systems offer a solution. AI can intelligently configure sites for more efficient operation, benefiting both tower companies and mobile network operators."

"AI can completely change the way we provide vertical real estate for telecoms," adds Edwards. "The industry is still reliant on manual processes and overworked operations teams. AI will enable diagnoses of problems before they occur as well as improvements in processes so that more time is spent providing connectivity and less time doing paperwork."

The challenges posed by unreliable grid infrastructure intensify the requirement for more dependable power sources. Simultaneously, tower operators face increasing pressure to provide highly available and resilient towers to meet the demands of network operators who rely on these infrastructures, says Schafer: "in this context, tower design is evolving to incorporate resilient power sources as part of the broader transition to renewables. This involves ensuring sufficient battery capacity, careful planning, and the optimization of the entire power mix."

"The integration of AI into the realm of tower technology is poised to play a pivotal role in optimizing both the powertrain and the management of the towers themselves," says Gray. "AI is set to be a valuable ally in this endeavour. One of its key roles will be in configuring tower sites with greater efficiency, a task that operators have traditionally handled with somewhat standardized powertrain templates, as power management isn't their primary focus. By introducing AI into this process, sites can be run more efficiently, benefiting both tower companies and operators."

As we look to the future, the potential for AI to transform tower operations, enhance sustainability, and support the increasing demand for mobile data, will be central. ■



Ani Chiuзан



Matthew Edwards

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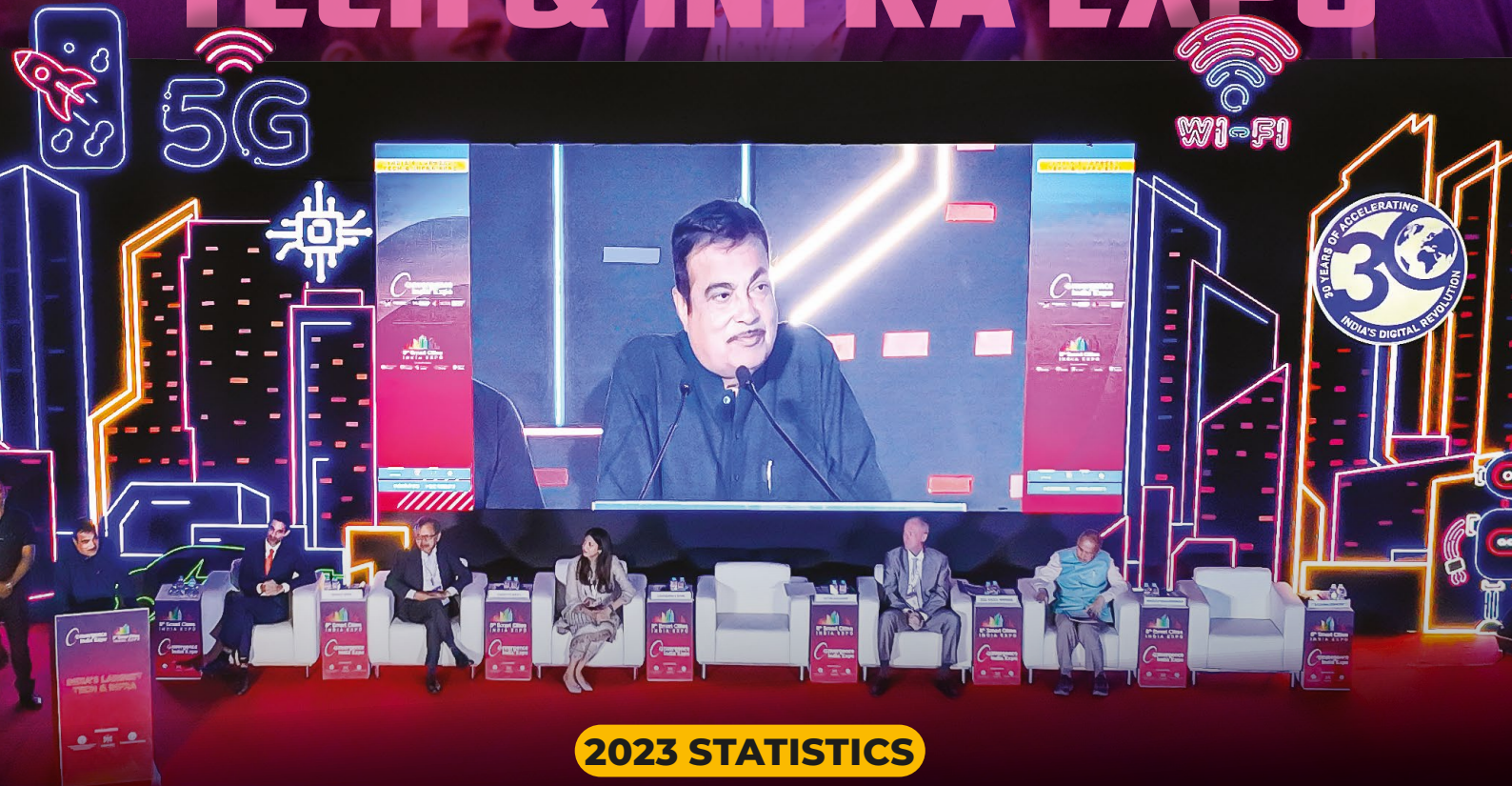
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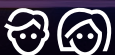
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Towercos: seizing opportunities to stay ahead

Sumedha Tatke, director – marketing and product management, Tarantula



The business environment has been challenging for the past two years, with inflation affecting economies globally. Towercos have faced issues like price increases, weak consumer demand, declining margins, and supply chain disruptions. To adapt, towercos have focused on optimizing operations and reducing costs.

However, cost-cutting measures alone are not enough. Towercos must embrace opportunities like 5G, prepare for 6G networks, utilize digital twins, and explore new revenue streams and business models in the evolving digital landscape. Digitalization is becoming a strategic approach for towercos due to market, internal, and technological pressures.

Digitalization drivers

Towercos are no longer asking why they should embrace digitalization but rather when. Digitalization is revolutionizing the industry, prompting towercos to seek innovative ways to enhance efficiency and reduce costs. Identifying and acknowledging the driving forces behind this transformation is relatively straightforward.

The market imperative

The EY report, 'Digital InfraCo – unlocking the tower power,' highlights market opportunities towercos should pursue. Towercos will be compelled to explore these opportunities soon. The report presents the following key areas:

- **Strengthening the core:** Towercos should focus on meeting the increasing demand for high-speed, high-bandwidth traffic. The rollout of 5G calls for network densification through small cells and a robust fibre

backhaul network, which towercos are well positioned to address.

- **Adjacencies:** Leveraging their infrastructure strength, including a widespread tower network, real estate expertise, and power management capabilities, towercos can generate additional revenue through adjacent services like EV charging, warehousing, and advertising. Adopting a digital-first approach can enhance efficiency in managing these services.
- **The Digital InfraCo:** This opportunity represents a bold transformation for towercos. By becoming a Digital InfraCo, towercos evolve from providing tower infrastructure to becoming network providers. This shift allows for avoiding duplication and achieving better economies of scale. Successful transformation into a digital infraco depends on the digital maturity of existing incumbents.

In summary, the EY report outlines the market opportunities for towercos and emphasizes the importance of embracing digitalization and expanding their service offerings.

Internal impetus

Several internal factors drive digitalization within towercos. Firstly, the initiation of digital transformation by some companies prompts others to follow suit. The competitive landscape among towercos further fuels the adoption of digitalization as organizations strive to keep up with one another. Consolidation in the towerco industry through mergers and acquisitions also acts as a significant driver, with digital maturity in operations facilitating smoother due diligence and expediting proceedings.

Changes within the telecom sector impact Towercos' approach to digitalization as well. Consolidation has resulted in fewer competitors, necessitating strategic adaptations. Telecom companies prioritizing a 'digital first' approach with technologies like data-driven business intelligence, AI, machine learning, and generative AI create a bandwagon effect, compelling Towercos to take digitalization seriously and integrate it into their operations.

Technology suppliers

Tech suppliers play a significant role in the towerco industry, offering cloud computing, big data analytics, AI, machine learning, automation, and IoT solutions. They contribute to the growth strategy of towercos, providing digital solutions to

maintain competitiveness. Alongside co-creating tech solutions, tech suppliers also offer go-to-market (GTM) strategies, allowing towercos to stand out from the competition.

This collaboration creates a win-win situation for both parties.

Digitalization - various journeys

Towercos are increasingly adopting digitalization to enhance efficiency and profitability. This initiative is driven by factors like improved customer service, operational efficiencies, market responsiveness, competition, and better data management. Digitalization allows towercos to optimize asset utilization, streamline operations, and reduce maintenance costs using technologies like predictive analytics and AI. It also enables them to offer robust services by leveraging trends such as 5G networks and IoT solutions.

Towercos have multiple paths to embark on the digitalization journey. However, it's important to understand the distinction between digitization and digitalization. Digitization involves converting analogue information into digital formats, making it easily accessible and shareable. Digitalization, on the other hand, uses digital technologies to transform business processes, leveraging data for automation and improved performance. Both concepts are crucial for maximizing operations in the digital era, with digitization being a part of the broader digitalization process.

Path 1 - big bang digital transformation

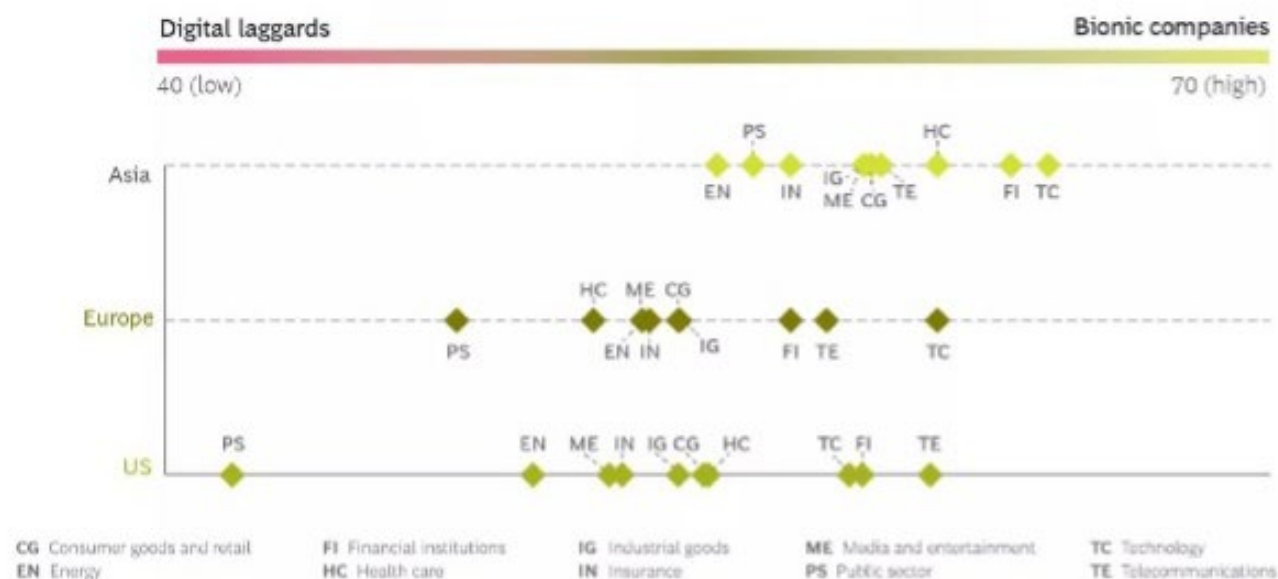
The path towards digitalization is demanding for towercos. It involves technology-enablement not only for tower infrastructure and operations but also for all business and support functions, including administration. It's a comprehensive approach where towercos go 'all-in' with their digital transformation efforts.

Path 2 - digitalization > point solution or platform

There are two sub-paths in the digitalization journey:

Point solution approach: This involves using specific software solutions to address individual problems. Point solutions focus on solving specific issues and can be integrated with other systems or platforms for a more comprehensive solution.

Platform approach: A platform is a set of tools and services that enable the development, management, and delivery of point solutions. It



provides the infrastructure for point solutions to run and integrates various functions, creating a unified user experience. In the context of telecom site management software, a platform approach would encompass centralized site lifecycle management, incorporating lease management, field service management, analytics, and more.

The platform approach allows for the deployment of multiple point solutions, such as location, site inventory, tower acquisition, O&M, and billing. This integrated approach improves executive decision-making by providing smarter data and faster analysis.

Path 3 - digitization

Towercos, along with companies in other industries facing technological disruption, often confuse digitization with digitalization. As previously mentioned, the distinction between the two has been highlighted. However, for towercos, digitization serves as a crucial initial step, building confidence to invest in future digitalization initiatives and embrace digital transformation.

Risk vs return

The 'all-in' Path 1 approach carries high risk as it requires significant resources in terms of time and money. Path 2 takes an evidence-based agile approach, addressing point problems incrementally, resulting in lower risk since only a portion of the business undergoes the change.

Assess digital maturity with DAI

BCG conducts an annual Digital Acceleration Index (DAI) study, a global survey of thousands of companies across various industries.

Referencing their 2021 study can provide towercos with ideas (note: this is not a recommendation, but a line of thought for towercos to consider). The survey covered 2,300 companies in 27 countries and 10 industries, assessing their digital maturity in 36 categories on a scale of 1 to 4. The scores were then normalized on a scale of 0-100 to determine their placement on the BCG Digital Acceleration Index (DAI).

The DAI categorizes companies into three groups based on their digital maturity:

Bionic companies (score: 67-100): These companies exhibit the highest level of digital maturity, excelling in technology, customer experiences, and innovation.

Digitally proficient companies (score: 44-66): These companies are making progress and investing in digital capabilities with the aim of continuous improvement.

Digital laggards (score: 0-43): These companies have limited digital maturity and face challenges in leveraging technology for desired outcomes.

Although the survey doesn't explicitly mention tower companies, it does include telecom companies, which were identified as bionic companies with high digital maturity. Telecom companies are strategic customers of tower companies, and the bandwagon effect is evident.

To assess their own digital maturity, towercos can refer to the self-assessment points below. Scoring themselves will provide insights into their current digital maturity, helping them identify strengths, areas for improvement, and prioritize digital transformation initiatives. The assessment presents representative criteria and corresponding questions, and towercos should consider which criteria are most relevant to their business situation. Assigning appropriate weights (in %) to the criteria will help calculate overall scores and guide progress in the digital transformation journey.

Press the four accelerators

The BCG study identifies four accelerators for enhancing digital maturity and driving value creation in tower companies:

Technology, data, and human capabilities:

- Analyze self-assessment results to identify strengths and areas for improvement.
- Create a roadmap for investing in technology, improving data quality, and upskilling employees.
- Promote unified data models and API integration for efficiency.

AI integration:

- Assess current AI investment and focus based on self-assessment results.
- Highlight benefits of AI integration and training employees in AI.
- Encourage prioritization and resource allocation for AI initiatives.

Governance and platform operating model:

- Evaluate governance structure and assign ownership for digital initiatives.
- Explain benefits of a platform operating model for collaboration and autonomy.
- Strengthen collaboration between business units and technology functions.

Technology and human capabilities connection:

- Assess culture and integration of technology and data into operations.
- Promote a culture of continuous improvement and human-tech augmentation (HTA).
- Leverage technology to automate processes, foster innovation, and design.

Regularly monitoring progress, reassessing digital capabilities, and adjusting strategies are crucial for staying competitive in the evolving digital landscape.

Shifting gears in telecommunication

In the telecommunications industry, the story unfolds with telcos building and managing their own network infrastructure.

Towercos emerged, specializing in managing and leasing tower infrastructure, allowing telcos to focus on core services. Infracos, the latest stars, take towercos to new heights by becoming network providers themselves through digitalization. However, the circle of life reminds us that things can change. Infracos may blend back into telcos or evolve into technology giants, driven by regulation, market dynamics, and technology. Only the digitally forward will survive, adapting to constant transformation.

The telecom industry teaches us the importance of adaptation and seizing opportunities to stay ahead. ■



Bharti Airtel implements large-scale VoLTE for disaster recovery

Bharti Airtel, which offers mobile, wireless, fixed line and high-speed broadband to consumers and businesses throughout India, has one of the world's largest voice over LTE (VoLTE) services in the world.

Dedicated to providing a world-class experience, Bharti Airtel turned to Nokia to help ensure a seamless and uninterrupted service experience for its customers.

A unique solution

Nokia Core Networks Global Services was able to implement the largest VoLTE geo-redundancy disaster recovery solution rapidly and cost-efficiently for the 155 million subscribers of Bharti Airtel in India.

When deployed as a cloud solution, VoLTE uses the data capacity of the 4G/LTE network and a cloud-based IMS (internet multimedia services) server that is located in the core network to provide a full range of voice and, potentially, video communications. The quality of voice calls is much higher than traditional circuit-switched voice services and, as a result of Nokia's implementation, is now supported by all of today's generation of Android and Apple smartphones.

VoLTE voice services are also capable of delivering highly flexible services to enterprise customers that integrate with enterprise unified communications systems. They can support field agents with the ability to combine data and video exchanges seamlessly into the call.

Moreover, services such as the Bharti

Airtel Emergency Alerts Service, which allows subscribers to alert up to 10 loved ones with one call, also rely on the availability of the system during disaster situations. It is critical, therefore, that these business- and mission-critical applications are highly reliable and secure, even in the case of disaster.

Creating redundancy

"Nokia and Airtel together designed and deployed a unique disaster recovery (DR) solution specific to Airtel, which uses N+1 mode with a single DR hub able to support multiple active hubs," said Rashim Kapoor, senior vice president – core networks, Bharti Airtel.

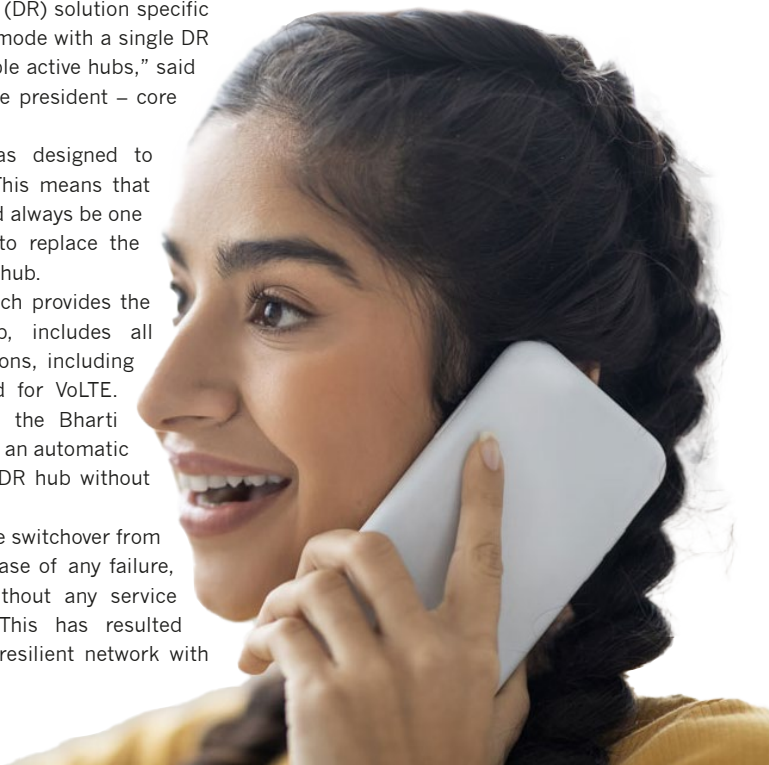
The Nokia solution was designed to create N+1 redundancy. This means that for all 12 hubs, there would always be one additional core available to replace the failure of a single regional hub.

This 12+1 DR core, which provides the disaster recovery backup, includes all Nokia core network functions, including the IMS functions needed for VoLTE. In the case that one of the Bharti regional hubs fails, there is an automatic cutover to the redundant DR hub without service interruption.

"The best part is that the switchover from active hub to DR hub in case of any failure, happens automatically without any service impact," said Kapoor. "This has resulted in a highly available and resilient network with

much better customer experience as the services remain available even in case of any partial or complete failure of any of the hubs. As a result, Airtel is confidently moving faster to convert the entire circuit-switched voice network to Nokia's VoLTE IMS solution, thus improving VoLTE uptake in the Indian market."

As a result of the collaboration, Bharti Airtel's 155 million subscribers across the continent now have access to more high quality, resilient communications via voice than ever before. ■



Turbo-charging communications restoration post-typhoon

Massive devastation caused by a life-threatening super-typhoon bringing torrential rains, flooding, landslides, and 160mph winds included severe physical damage to Globe's charging site in Vizmin, resulting in 23 million people being suddenly cut off from communications.

Repairing the site would take months to complete. However, Globe and Amdocs managed to successfully restore essential mobile and data services in under eight hours, giving back critical connectivity at a time when it was needed the most.

Modernising disaster recovery

Globe set out to build a comprehensive disaster recovery plan – including a strong 4G network – and worked with Amdocs to design an innovative infrastructure that would provide Globe with geographical resilience.

Although the main objective of the modernization project was to extend Globe's charging capabilities to support 5G, Globe now had access to extensive disaster recovery capabilities built into the new version of the Amdocs Turbo-Charging system. The original Turbo-Charging technology enabled service providers to support massive subscriber growth without substantial hardware investment, leading to significantly reduced hardware costs and lower total cost of systems ownership.

With the newest version, Globe was able to respond effectively in the face of the typhoon thanks to its comprehensive disaster recovery plan with innovative fall-back capabilities which had been designed and operationalized together with Amdocs Delivery and Managed Services (SmartOps) experts as part of the Amdocs Turbo-Charging update project. This afforded Globe



both the opportunity and tools to effectively counter the Philippines' significant environmental and geographical challenges resulting from facing approximately 20 typhoons a year.

Splitting up subscribers

With the new disaster recovery capabilities, Globe's entire 86 million subscribers (who were all located on a single charging site) could now be divided and migrated across three separate charging sites located in different geographical regions to reduce the potential impact of any outages.

"It's important because we know communication is aid," said Emmanuel Estrada Globe Telecom SVP, technology strategy & service integration. "It's like water and electricity. You need to be able to reach your loved ones and find out what's going on around you. To do that you need connectivity."

In addition to splitting their subscribers geographically, Globe also established a fallback

disaster-relief charging site to be operationalized if any of the three main sites should fail. To ensure that the disaster relief site could be put into operation as quickly as possible, there was continual real-time synchronization of data between the production sites and disaster relief site using a virtualization management layer to run servers, storage, and software programs. The virtualization enables Globe to route critical platforms nationwide to ensure that essential mobile and data services remain available even during crisis situations.

In addition, Globe and Amdocs activated on-ground teams to carry out practice drills and disaster preparedness as part of the recovery plan.

100% recovery of essential services

As soon as the Vizmin site failed due to extensive physical damage from the super-typhoon, Globe and Amdocs disaster recovery teams across the world were activated and immediately began the process of operationalizing the disaster relief site.

Thanks to efficient, thorough preparation combined with the extensive disaster recovery capabilities embedded in Amdocs Turbo-Charging and the fact that the disaster relief site already had all the data because it had been continuously replicated in real-time beforehand, the site was fully operational in less than eight hours.

Globe and Amdocs's disaster recovery efforts resulted in 100% recovery of essential mobile and data services. Considering the technical complexities involved in achieving this, this was a major success for the multiple teams working on recovery assistance, across different time zones and countries. ■



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Expanded NTN capabilities to connect the underconnected

Skylo Technologies has announced a strategic partnership and ongoing collaboration with Rohde & Schwarz to reinforce and expand the testing capabilities for non-terrestrial networks (NTN), ensuring that chipsets, modules, and devices using the NTN NB-IoT protocol integrate seamlessly with Skylo's network and are 3GPP Release 17 compliant. The two companies will integrate state-of-the-art testing methodologies to guarantee

that Skylo's groundbreaking connectivity solutions meet the highest standards of quality and efficiency.

Skylo's NTN is designed to bridge the digital divide by providing reliable and affordable connectivity to under-connected industries, such as agriculture, maritime and logistics. The network leverages advanced satellite and terrestrial technologies to allow real-time data transmission, thereby transforming

industries that have previously been limited by a lack of connectivity.

The Rohde & Schwarz NTN device acceptance test framework is built on the market-leading R&S CMW500 wideband radio communication tester. This framework is the go-to solution for all stages of terrestrial and now non-terrestrial IoT testing, from R&D and GCF/PTCRB certification to carrier acceptance tests. With the powerful R&S CMW500 software

stacks, this framework guarantees reliable and repeatable results in a single box, ensuring that the whole ecosystem can achieve the highest levels of performance. It comes with NTN Release 17 features as well as support for different orbits. Customers can leverage their investment in R&S CMW500 testers with a single software update, which enables them to verify NTN NB-IoT as well as legacy NB-IoT devices.

Iridium GO! premium fixed install antenna kits connect mobility users on the go, on land and at sea

Iridium Communications has released Iridium GO! exec Premium Dual Mode and LITE Antenna Kits for fixed-install applications.

The new kits allow users to enjoy all the features of the device while in-cabin, below deck, or in-vehicle on-the-move both on land and at sea. The Premium Dual Mode kit includes a combined GNSS and Iridium antenna, Iridium certified extended antenna cables, and a variety of device mounts for boats, vehicles, and fixed locations like cabins. The LITE version of the kit offers a dedicated Iridium omnidirectional antenna, extended cable, and a fixed rail mount.

Iridium GO! exec operates off Iridium's global network, keeping users' favourite personal devices such as smartphones, tablets, and laptops connected anywhere in the world. With Iridium's weather-resilient L-band network, voice calling, two-way messaging, emailing, social media posting, internet access, and emergency SOS can all be completed, even in adverse weather conditions. This delivers the market a dependable and one-of-a-kind personal communications experience for those needing to use their own devices while outside cellular coverage.

"The high mobility and easy pole-mount installation system



of the Iridium GO! exec and external antenna kits deliver a robust, portable personal device connectivity experience," said Josh Miner, vice president, land mobile, Iridium. "A fixed external antenna kit paired with an Iridium GO! exec is a must-have for all types of remote workers, yachters, and off-grid travellers like RV'ers."

Consumers can choose between the two external antenna kit options, one with a premium dual mode antenna, and one without GPS and similar GNSS services built in, but at a significantly reduced cost. These options allow users to choose the kit best tailored to their specific communication needs. Equipment in both kits feature an IP68 rating, ensuring durability to withstand adverse weather conditions.

Industrial SMEs to benefit from compact private wireless connectivity

The new Nokia DAC PW Compact has been announced, featuring a new configuration optimised to meet the private wireless connectivity needs of small-and mid-sized industrial sites.

As more industries move toward digital transformation to improve their business processes, a compact version of Nokia's private wireless solution delivers the rigorous security and reliable connectivity that ensures even the smallest enterprise sites can benefit from the transition.

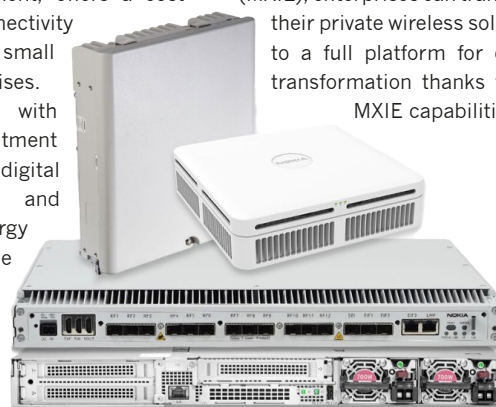
The Nokia DAC PW Compact is designed to address the growing demand for small-medium size campuses. Based on the Nokia AirScale small cells, it delivers pervasive connectivity for both human and machine in the toughest industrial environments. Its smaller form factor aligns to the coverage requirements of small industrial sites, and with zero upfront investment, offers a cost-effective connectivity option for small industrial premises.

In keeping with Nokia's commitment to accelerate digital transformation and green energy adoption, the Nokia DAC PW Compact is up to 60% more energy-efficient than

WiFi, resulting in much lower energy footprint.

The platform is suitable for small enterprises within ports, manufacturing, mining, petrochemical, retail, and many more industrial segments. It is easy to use with plug-and-play deployment and IT native operability, and provides configurations for indoor, outdoor, and mixed radio coverage. Larger enterprises deploying the Nokia DAC PW Compact in small facilities will have the confidence of a single multi-site private wireless solution deployed across all their campuses.

As enterprises expand their private wireless deployment over time, there is an easy upgrade path to add incremental capacity, users, and radio configurations, as well as allow for the addition of WiFi technology. Additionally, by converting the deployed edge to Mission Critical Industrial Edge (MXIE), enterprises can transform their private wireless solutions to a full platform for digital transformation thanks to the MXIE capabilities.



Sitetracker adds GIS for towerco design

Sitetracker has launched new capabilities to its solution to help network operators, engineering, and construction companies accelerate the rollout of fibre broadband by layering construction plans with geographic information systems (GIS) data.

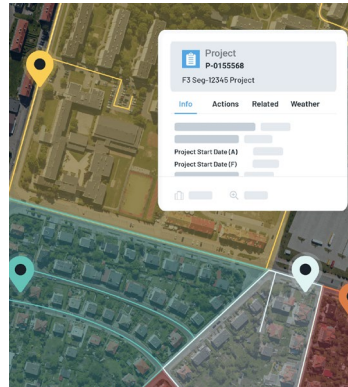
The new solution, Sitetracker GIS Link, connects geospatial data from web GIS systems such as Esri's ArcGIS within Sitetracker's deployment operations suite. GIS Link will also support new functionality within Sitetracker that will provide network operators enhanced visibility into deployments by rolling up key metrics such as homes passed by market and servicing area. These new capabilities will allow GIS data to be shared more efficiently, driving improved collaboration between internal and external parties, and enabling broadband to reach rural and underserved communities faster.

"We're excited to be among the first to roll out Sitetracker GIS Link! With fibre work continuing to ramp up, GIS-enabled workflows are vital to improving collaboration while reducing inefficiency," said Rob Reynolds, chief information officer and chief administrative officer at Congruex. "Aligning geospatial data with projects is a logical evolution that enables Sitetracker to remain

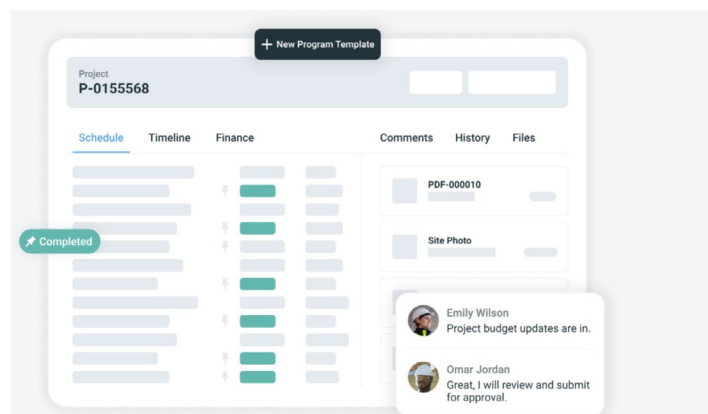
a key and core system in our overall architecture."

Sitetracker GIS Link will also benefit telecom towercos, solar developers, EV companies, and other infrastructure companies by enabling multiple map layers, so companies can reduce swivel-chair analysis of wireless site candidates or solar developments and instead use proprietary site data within their deployment operations management functionality.

With fully integrated geospatial data, GIS Link makes it easy to align planning, engineering, and construction work. The solution offers a unified, real-time workflow between stakeholders allowing them to keep network plans aligned with construction progress and enabling more efficient handoffs. For project managers, engineers,



and construction managers still relying on paper copies and ad hoc collaboration tools, the software simplifies the ability to receive GIS-based work plans, organize and schedule work, accurately capture production progress, and quickly report – all without manual processes or duplicate data entry.



Look out for...

AI comes to wireless comms

2023 is the year of artificial intelligence (AI). With generative AI coming into its own among consumer, enterprise and government spheres, AI is inching its way into every industry on the planet – and mobile is not immune.

One way that wireless performance is optimised is by providing accurate channel state information (CSI), which is used in real-time throughout a wireless system to adapt transmissions as best as possible to current channel conditions with the goal of maintaining the best performance. This is a crucial component to achieving reliable communications with high data rates and multi-antenna systems.

Traditionally, calculating and reporting accurate CSI is computationally and resource intensive making it a good candidate to begin integrating AI and ML into the network. Accordingly, wireless researchers at University of Malaga (UMA) – in partnership with Keysight – developed an AI / ML model for CSI feedback enhancement for 6G systems.

Keysight developed a digital twin platform to emulate the performance of ML models in real world conditions. Building an interface layer that connected to Keysight's PathWave System Design (SystemVue) modelling tool, UMA researchers were able to evaluate the model under a wide array of fading profiles and other test conditions to prove this method outperforms traditional approaches.

The interface allows any AI/ML algorithm that adheres to the most common AI/ML APIs and frameworks can now be imported into Keysight's SystemVue and used by the entire industry.

To assist in this process, Keysight and UMA are working together to bring this to the 3GPP RAN-1 standards body for Release 18.

Cloud-based 5G roaming laboratory enables MNOs to try before they buy

Tata Communications has launched a global, cloud-based 5G Roaming Laboratory, enabling mobile network operators to trial 5G standalone network use cases before introducing the service to their subscribers.

The cloud-based 5G Roaming Lab trials the international mobile roaming experience by closely monitoring traffic movement and network usage for giving the highest quality of experience to mobile phone users while roaming. Its tests get an objective performance assessment across networks, connected in the exchange process while a user is roaming. This also includes onboarding and

internet trials on the high-speed, high-reliable and low-latency 5G standalone network.

The new 5G Roaming Lab is designed with safety at the heart of its operations. It is equipped with hi-tech server applications that provide high-speed and seamless 5G roaming connectivity along with network security. Agile and secure network is critical considering 5G adoption is accelerating globally with GSMA predicting 5 billion 5G connections by 2030.

"Connectivity is a key ingredient in today's fast-paced digital world. An internet that is fast, secure and available at all times is of paramount

importance to customers, whether they are individuals or an enterprise. We are excited to introduce our newest capability in 5G roaming testing ensuring MNO customers are receiving proven services," said Mysore Madhusudhan, executive vice president, collaboration and connected solutions, Tata Communications. "By ensuring that the tests can take place across geographies, enhances the flexibility available to MNOs for delivering superior and agile services. Armed with fast and uninterrupted connectivity, this generation will accelerate a lot faster than its predecessors!"

02 Czech Republic launches 4G/5G in all 61 Prague Metro stations for consumers and critical comms

 02 Czech Republic has launched 5G services in Jiriho z Podebrad metro station in Prague. With the launch, 4G/5G broadband services are now accessible in all 61 Prague Metro stations, including tunnels.

The initiative to provide high-speed internet coverage in all Prague metro stations is a collaboration between a consortium of operators: T-Mobile, O2, Vodafone, and CETIN. After the

cable replacement, installation of new technologies, connection of distribution with radiation cables throughout the tunnel section, and increasing the number of antennas to 16, all customers can now experience uninterrupted services and enjoy high-speed internet.

The network enhancement not only provides users with increased security in situations where emergency communication is necessary, but also


enhances travel comfort for passengers, making life easier with connectivity available throughout the journey.

"This marks the end of one of the most important joint investment projects of the three largest Czech mobile operators. Thanks to it, the people of Prague have coverage of all metro stations with the fastest mobile internet, which allows them to be online, listen to music or even watch their favourite shows during the entire journey

to work, school or for entertainment," said O2 Czech Republic in a statement.

The operators are continuing their cooperation with the Prague Public Transit Company (DPP) and have already installed technologies and antenna systems as part of the project documentation for the construction of the new D metro station. The expansion of coverage to the new sections will occur concurrently with the construction of the stations.

Batelco launches MENA's first 'Mobile Peering' service

 Batelco has introduced 'Mobile Peering,' a service available on Manama IX (MN-IX) for platform members, making it the first in the Middle East and Northern Africa (MENA) region to provide this service.


The Mobile Peering service is a secure and open interconnecting solution facilitating the exchange of

global mobile roaming data between mobile operators and Internet Packet Exchange (IPX) providers.

The advantages of this service include improved network efficiency and reduced latency through direct connections between mobile providers on MN-IX. This direct exchange of mobile traffic with

other mobile networks enhances the roaming experience for the mobile operators' end-users. The service eliminates the need to pay a third party to carry mobile data traffic, resulting in overall cost savings that can be passed on to end-users, leading to more competitive mobile roaming data plans.

LLA to sell 1,300 mobile towers to PTI

 Liberty Latin America (LLA) will sell 1,300 mobile tower sites across Panama and various Caribbean islands to Phoenix Tower International (PTI) in a deal valued at \$407 million.

PTI will acquire LLA's tower sites in Panama, Jamaica, the Bahamas, Puerto Rico, Barbados and the British Virgin Islands. LLA will continue to use the sites under long-term master lease agreements for each market included in the transaction terms. The \$407 million figure also includes an agreement by LLA and PTI to build another 500 towers in those markets over the next five years.

PTI CEO Dagan Kasavana said that the deal will strengthen its presence in existing markets and enable new market expansion in the Bahamas, British Virgin Islands and Barbados. Meanwhile, LLA president and CEO Balan Nair, said that the company will use the proceeds from the PTI deal to reduce debt and further invest in its businesses.

"The long-term lease agreements and ongoing coverage extension will enable us to continue delivering leading mobile services to our customers and support network expansion including future 5G deployment plans across the Caribbean and Latin America, while lowering capital costs associated with these assets," said Nair.

Telespazio gains access to Sparkle Sicily Hub

 Sparkle has signed an agreement with Telespazio for fibre-optic access to Sparkle's Sicily Hub in Palermo.

The Scanzano Space Centre - operational since 1989 and located near the artificial lake of the same name about 47km away from Palermo - is specialized in providing hosting and housing services for large international satellite operators using low earth (LEO), medium earth (MEO) and geostationary (GEO) orbit constellations. These services require resilient and stable connections with a high level of performance.

Under the agreement, the Scanzano Space Centre is connected via its own fibre optic ring to Sparkle's Sicily Hub in Palermo - a state-of-the-art neutral

data centre and key internet hub in the Mediterranean thanks to the presence of content platforms and cloud applications of the world's major players and the connection of all international cables landing in Sicily - with the consequent opportunity of offering its customers high-speed and reliable connections worldwide.

With the activation of Sparkle's new BlueMed submarine cable - connecting Italy with France, Greece and several countries bordering the Mediterranean all the way to Aqaba in Jordan - the Scanzano Space Centre will be able to count on connections at multiples of 100-400Gbps to Europe, Asia and the Middle East.

In Italy, where the cable is active since September, BlueMed increases


the resilience of Sparkle's network by offering a safe and diverse route between Sicily and Milan, with a latency reduced by 50% compared to the terrestrial backbones connecting the two capitals.

"With access to Sparkle's Sicily Hub, the Scanzano Space Centre consolidates and expands its capacity to connect to the global network, enabling Telespazio to offer its customers connectivity services with increasing speeds and high reliability. This is essential to promote the Scanzano centre as a Mediterranean satellite hub, enhancing its geographical position," said Alessandra Farese, SVP satellite systems and operations of Telespazio.

"We are very pleased with this agreement with Telespazio, a company of international relevance with which we share the mission of offering global services," said Enrico Bagnasco, CEO of Sparkle. "This agreement is a new confirmation of how, also thanks to BlueMed, the Sicily Hub in Palermo is strengthening its success as a strategic asset for the digitalisation of the country and a key hub for data traffic in the Mediterranean."



Intelsat and AMN to deploy 1,340 rural satellite antennas in DRC, Rwanda and Madagascar

 Intelsat and Africa Mobile Networks (AMN) have deployed more than 3,000 rural base satellite antennas across several countries in Africa since 2018, providing new telecommunication services to more than 8 million people.

AMN's largest network is in Nigeria and now features more than 1,350 sites. With more than 450 sites added just since June 2023, the collaboration now provides phone and internet services to more than 3.5 million people in previously unconnected Nigerian communities.

"Through this commitment to bridging the digital divide, we've made a significant impact and we look forward to furthering our mission of connectivity, ensuring that more communities can access the benefits

of telecommunication services," said Jean Philippe Gillet, SVP of global sales for networks and Media at Intelsat. "Together with AMN, we aim to make a lasting difference in Africa's digital landscape."

Intelsat and AMN are planning additional operations in Madagascar, Rwanda, and DRC. AMN expects to build more than 1,340 rural base stations across the three new markets.

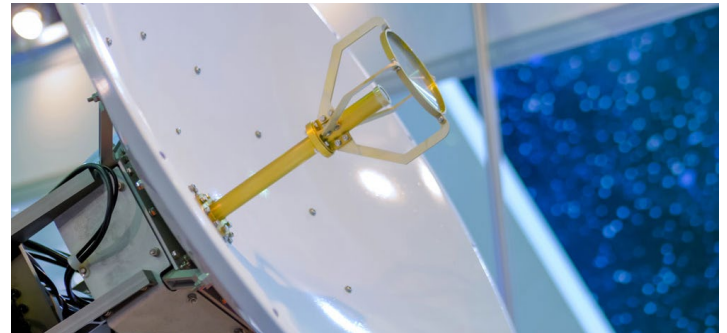
Combining Intelsat's multi-satellite African coverage with AMN's solar-powered tower solution means that citizens and businesses in virtually any community can now have access to the education, social and economic benefits of telecommunication services.

AMN specializes in connecting communities, reducing upfront and


ongoing equipment costs while allowing cell services to be extended into areas where traditionally it was not economically viable to do so. The use of satellite to provide backhaul connectivity to remote cell towers is integral to this business model. The location and terrain of these towers often do not allow backhaul

solutions like fiber-optic cable and microwave to be used.

"Intelsat is a very important partner to AMN. Our strategic partnership has provided essential telecommunication services to 8 million people across Africa, and we look forward to growing that number over the coming years," said AMN CEO Mike Darcy.



Somalia prioritises emergency telecommunications

 The Somali government has launched the National Emergency Telecommunications Plan (NETP) with technical assistance from the International Telecommunications Union (ITU), which aims to establish a unified and effective communications framework to streamline communication and disaster response efforts.

The launch of the NETP comes as Somalia has been facing, since October a flood episode of a magnitude that, statistically, is only likely to occur once in 100 years, according to the Bureau of

the United Nations Coordination of Humanitarian Affairs (OCHA). The floods have already caused around 30 deaths, as well as the displacement of nearly half a million people. In total, this disaster disrupted the lives of more than 1.2 million people.

"In the face of unpredictable emergencies, our collaboration on the National Emergency Telecommunications Plan strengthens Somalia's resilience. Together, we are building a safer and better connected nation," said Jama Hassan Khalif, minister of communications and technology.



UScellular wins \$5.8 million from Missouri Cell Towers Grant Program

 UScellular has been awarded over US\$5.8 million from the Missouri Cell Towers Grant Program to improve mobile and in-home connectivity in multiple counties across the state.

The Missouri Cell Towers Grant Program is dedicated to investing in the expansion of cellular service throughout the state. With this funding, UScellular has announced plans to construct 11 new cell sites, thereby expanding wireless coverage in the following 19 counties: Adair, Audrain, Clark, Howell, Knox, Laclede, Lewis, Marion, Monroe, Oregon, Ozark, Pike, Ralls, Randolph, Schuyler, Scotland, Shelby, Texas, and Wright.

UScellular expects the new towers to be constructed and operational late in 2025. Building and maintaining a new cell tower in rural areas can cost twice as much as building one in an urban centre, meaning programs like this play a crucial role in enabling wireless carriers to quickly and efficiently connect residents.

Moreover, UScellular will be discontinuing its CDMA network in 2024 and reallocating the network for 4G/LTE services. The company CEO said that "of note regarding our network initiatives, we will be shutting down our CDMA network at the beginning of 2024. Our team has done an excellent job migrating the customer base away from CDMA-dependent devices. Less than 42,000 customers are left and that's down from 386,000 just 18 months ago. We believe we're going to continue to see more customers migrate over the next several months. We intend to reform that spectrum to support our LTE network. And we expect to see additional systems operation savings once that CDMA network is fully shut down in 2024."

UScellular utilises the 800MHz and 1900MHz spectrum to provide CDMA services. The company anticipates that by the end of 2024, approximately 50% of data traffic will be handled by sites equipped with mid-band spectrum.

Orange Spain to prevent fire in agri-food plants with 5G+ network



Orange Spain has commenced testing a solution designed for the prevention and early detection of fires in agri-food plants and large warehouses.

This initiative leverages edge computing and 5G SA technology, Orange 5G+. Orange will invest Euro 4 million in the project, with almost Euro 1.3 million being subsidised by the Single Sectoral 2023 Program launched by the Ministry of Economic Affairs and Digital Transformation.

The project is based on an application that collects real-time

data from IoT sensors, drones, and autonomous robots using Orange Spain's 5G SA Network. This information is processed with the help of AI, which can predict a fire before it occurs by detecting thermal anomalies. Additionally, it generates immediate automatic responses through ultra-low latency.

"This project is an example of the great potential of edge computing technology, supported by a 5G+ network, in the business world. These two technologies allow data processing to be carried out very close to the place where

they are generated, which is key in all applications that require immediate response times, such as industrial automation, security services or the development of smart cities with the aim of improving the quality of life in urban environments," said Orange in a statement.

Orange said that 5G+ will allow the definite development of IoT, thanks to advantages such as ultra-low latency, maximum connections at maximum speed, better indoor coverage, and longer battery life provided by 5G SA networks.

Prospecta Utilities to deploy mmWave 5G SA network



Airspan Networks has partnered with Prospecta Utilities to deploy a state-of-the-art 5G mmWave Fixed Wireless Access Network (FWA) across Australia.

The deployment is expected to transform the way citizens and enterprises will connect and communicate. Prospecta Utilities aims to transform the telecommunications infrastructure within its home campus, GemLife. The company's investment in its own telecommunications infrastructure will not only enhance the overall business case but also reduce the fixed fees paid to service providers.

Airspan's mmWave AIO Outdoor Small Cell will power the project. With the deployment of Airspan's AIR5G 7200 5G solution, embedded with CU/DU (centralised unit/ distributed unit) running SA software, Prospecta Utilities will be able to deliver a real alternative to fibre-based solutions, said the company in a statement.

With the deployment of this infrastructure, residents will gain access to a range of triple-play services, including high-speed data, voice, video, and even video-on-demand. The 5G mmWave Fixed Wireless Access network project across Australia under the collaboration will begin pilot testing by March 2024, marking Airspan's first mmWave Standalone deployment.

REALLY expands DeWi network across the US



Optiva has been selected by REALLY to power and grow its new mobile phone service nationwide, powered by Optiva BSS on Google Cloud. REALLY is on a mission to bridge the digital divide by introducing a nationwide decentralized wireless (DeWi) network across the U.S., commencing in Austin, Texas.

The REALLY DeWi network is powered by the people, bringing the sharing economy to the telecom industry. The network is fueled by strategically positioned cell site radios hosted on rooftops and balconies, making increased speeds and seamless roaming available to all customers on the

network. Recognizing connectivity is a necessity, its decentralized network is about providing service and creating community through its G.O.A.T. program, honoring people and causes while offering free and discounted services to qualified first responders, teachers, veterans, and other deserving individuals to make quality mobile connectivity universally accessible.

"Optiva is inspired by REALLY's vision to bridge the digital divide and enable better coverage and faster speeds for consumers across the US," said Robert Stabile, CEO of Optiva. "We are proud that our Optiva BSS will bring the functionality needed to achieve their goals. Optiva's mission

is to power innovation in the telecom industry, and REALLY is a shining example of that goal."

REALLY will be empowered by Optiva's full suite of comprehensive BSS features, pre-integrated carrier APIs, third-party services, dual-network provisioning and turnkey managed services and support.

"Our mission is unique, and we needed a BSS platform that delivers a broad range of functionality and integrations, plus a rapid launch with the scalability to support nationwide growth," said Adam Lyons, founder and CEO of REALLY. "Optiva's comprehensive software, telecom expertise and dual-network support were key to choosing Optiva."

DAT and Clipfeed join forces on mobile gaming



Côte d'Ivoire's Digital Afrique Telecom (DAT) has teamed up with e-sports entertainment company Clipfeed to provide mobile gaming solutions for African telecoms operators.

The partners will collaborate on the development of Africa Gaming Box, a white label platform for mobile carriers to deliver e-sports services to subscribers across the continent.

GlobalData forecasts that the e-sports market would be worth \$1.64 billion in 2023 and will increase at a compound annual growth rate of 16.7% until 2030. e-sports acceptance in Africa will be supported by increased mobile and

PC gaming usage, high accessibility and inclusiveness, and the growth of 5G connectivity.

"The continent has a young and growing population, with more than half of Africans under the age of 25. This is the group most likely to be interested in e-sports," said DAT and Clipfeed in a joint statement. "Over 500 million Africans had internet connection in 2022, and this figure is predicted to rise to over one billion by 2025."

"This partnership will allow us to reach a wider audience and help to grow the e-sports community in Africa," said Michael Whelan, CEO and founder, Clipfeed.

"E-sports remains a very large opportunity in Africa, and we are extremely pleased to partner with Clipfeed to open the doors for

the continent's mobile operators to reap the benefits of this booming industry," said Simplice Anoh, CEO, DAT.



Q&A

Jerome Perret,
CEO,
IT-Development,

**Who was your hero when you were growing up?**

Since my childhood, I have been inspired by: Jean-Paul Belmondo, a French actor, famous in the 1970s. His roles evoked in me a unique blend of sportive spirit, sense of humor, and charisma. Jean-Paul Belmondo embodied a spirit of adventure and cheerfulness, qualities that have deeply influenced my journey. These traits have shaped how I approach challenges, seamlessly combining professional seriousness with friendliness. Thus, in leading my team, I strive to embody these values, creating an environment conducive to growth and success.

What was your big career break?

My significant career breakthrough came with my initial role in the telecommunications industry. Taking that opportunity propelled me forward. It led me to Belgium, where I became the pioneering site acquisition consultant and one of the first two negotiators for Orange Belgium.

What did you want to be when you were growing up?

As a child, I aspired to be a police commissioner. I am driven by a deep affinity for order and justice. I relish action. While my path led me in a different direction, that early desire for law enforcement continues to inform my commitment to integrity and responsibility in all endeavors.

If you could dine with any famous person, past or present, who would you choose?

If I could share a meal with any famous figure, past or present, it would unquestionably be

Napoleon Bonaparte! After assuming his regnal title, he emerged as a prominent figure in the midst of the French Revolution. He distinguished himself as a formidable French military strategist and a pivotal political figure, achieving notable triumphs in the Revolutionary Wars. He stands as a monumental conqueror, illuminating his nation and leaving an indelible mark on history. His legacy extends far beyond his military conquests; he authored a multitude of laws that continue to serve as cornerstones in numerous countries worldwide. Napoleon's influence resonates in the bedrock of our modern world, shaping the way societies operate and thrive. Dining with such an influential figure would be an honor and a profound opportunity to gain insights into the mind of a visionary who helped forge the path of our contemporary civilization.

The Rolling Stones or the Beatles?

Given the choice between The Rolling Stones and the Beatles, I'd have to go with the Beatles! Their music provided the soundtrack to my youth, and unlike the Rolling Stones, they exuded a certain elegance and sophistication (it is a very personal opinion, I have to admit it!). I greatly admire the swiftness with which they achieved such immense success.

What's the best piece of advice you've been given?

The deepest advice I've received is to 'help others and love thy neighbour.' This principle has guided my openness and genuine enjoyment of meeting new people. For instance, I relish the chance to engage with taxi drivers

in most places where I go, finding their stories and perspectives endlessly fascinating. This advice has not only enriched my personal interactions but has also shaped my approach to leadership. It enforces me of the importance of empathy, connection, and understanding in both professional and personal spheres.

If you had to work in a different industry, which would you choose?

If I were to embark on a different career path, there are two industries that have always intrigued me. The first is the world of sports. Becoming an agent for surfers, football players, or motocross riders would be an exhilarating journey. It aligns with my passion for these sports, for negotiation, adrenaline, competition, and the dedication that athletes embody. The second industry that has always beckoned me is the culinary world. I've nurtured a long-standing dream of opening an American-style steakhouse with an in-house BBQ, reflecting my love for cooking.

What would you do with £1 million?

With £1 million in my possession, my immediate inclination would be to invest it in my burgeoning startup, BuildAndRun, and my eponym software, 100% dedicated to smart contractors who want to upgrade their project management. This infusion of capital would bypass a fundraising campaign that we've been strategically planning. With a firm grasp of the industry, a strong IT presence, and our existing relationships with contractors,

such as Camusat, we're well-positioned to make significant strides in our expansion. This investment would not only foster the development of our innovative enterprise but also contribute to the ever-evolving landscape of technology and business, allowing us to harness the full potential of our entrepreneurial vision.

Where would you live if money was no object?

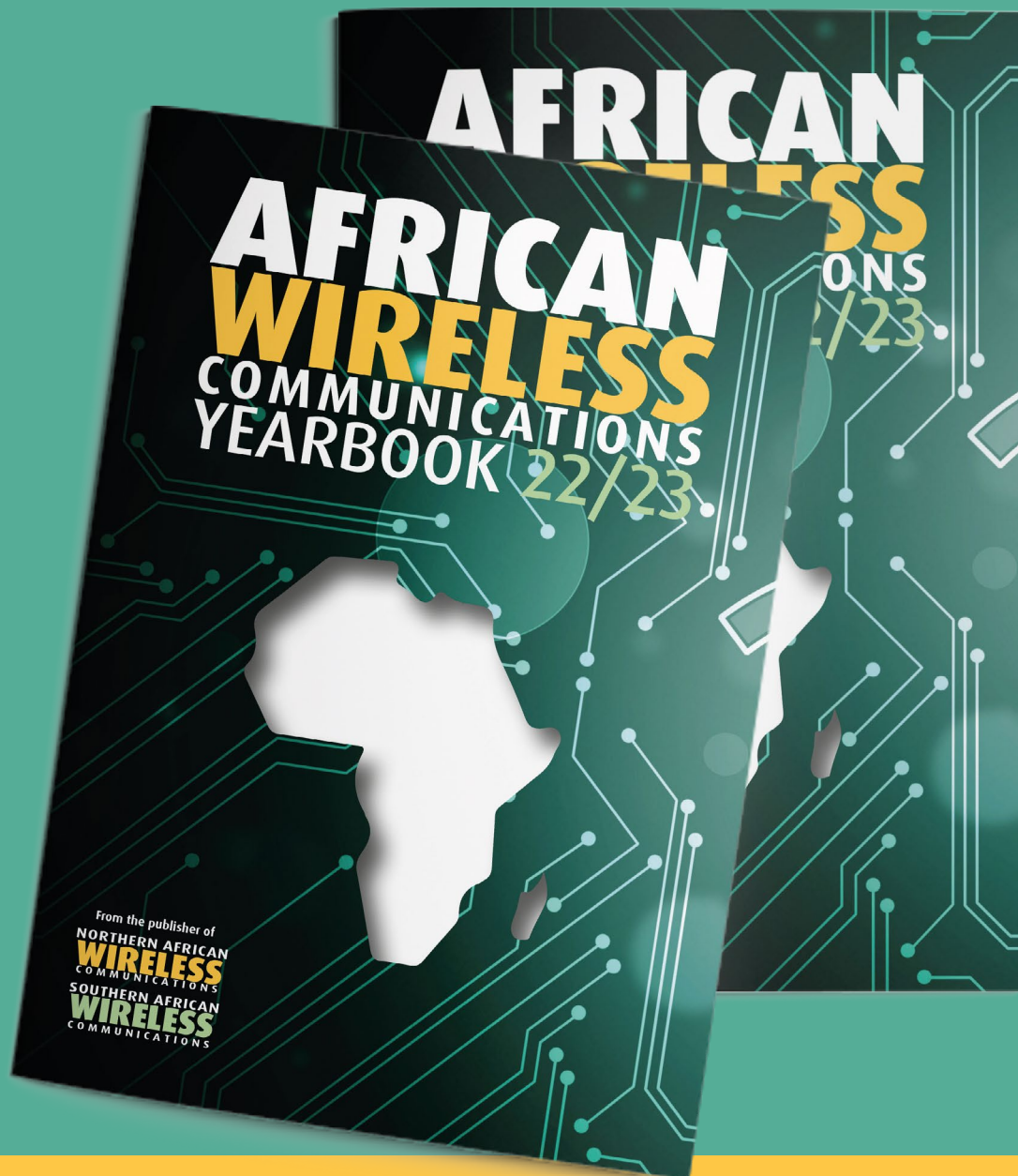
If money were no object, I'd choose to reside in several different places. This way, I'd have the opportunity to travel extensively and spend more time in Asia, like Vietnam (for its cuisine and to meet with our team more often), Egypt (for its rich history and the unique atmosphere of Zamalek), or even Abidjan in Ivory Coast (for the vibrant nightlife and the extreme kindness of the locals). Moreover, I'd allocate a month each year to Florida, reminiscent of my student days, where I could leisurely surf with friends and enjoy cold beers at Coconuts on the Beach not far from the 13th. And, of course, I'd maintain a residence in Europe, close to my roots.

What's the greatest technological advancement in your lifetime?

The most monumental technological leap in my lifetime has undeniably been the advent of the internet. Its transformative power has reshaped how we communicate, access information, and conduct business on a global scale. Following closely behind is the revolution of ChatGPT, a true amplification of capability. Together, these advancements have propelled us into a future brimming with limitless possibilities. ■

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