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Patrick Johansson,
President of Ericsson Middle East and Africa

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Patrick Johansson, President of Ericsson Middle East and Africa

Ericsson's Century of Excellence: Shaping Next-Generation Networks

Under the leadership of Patrick Johansson, the newly appointed President of Ericsson Middle East and Africa, Ericsson is on a mission to build a world where digitalization is transforming the ecosystem, driving sustainable development, and creating opportunities for all.

Telecom Review conducted an exclusive interview with Patrick Johansson, President of Ericsson Middle East and Africa, to learn more about his vision for the company, Ericsson's journey within the region, the impact of forging strong collaborations, and the gaps the entity is addressing as a leading telecom vendor.

Congratulations on your new leadership role within Ericsson MEA. What strengths and vision will you bring to lead the business in the region?
The MEA region, with its incredible talent and opportunities, has become one of Ericsson's most exciting markets. We have a rich history here that speaks volumes. We have always been at the forefront of driving

technological innovation, supporting digital transformation, providing reliable connectivity, and having a positive impact on society. As much as we have accomplished, I believe there is still so much potential out there waiting to be tapped—And that's what thrills me the most about this new role.

With accelerated digitalization and emerging technologies, we are at an exciting time in our industry as we advance our journey towards programmable, differentiated networks. I believe that our mission to strengthen our leadership in mobile networks, expand into enterprises and drive a culture transformation with ethics and integrity at the heart of every decision will enable us to capture future value for our customers and stakeholders.

My main focus in the short term is to meet our customers and people, listen to their needs and challenges, and align them with the opportunities that lie ahead. If our customers succeed, we will succeed; so, it's very important that we share joint visions on how to accelerate growth by focusing on key opportunities, executing projects flawlessly and fostering strong collaborations with the ecosystem to spur innovation.

As for my strengths, I have been in this industry long enough to understand that visions are not enough; we have to always be ready for the next big thing. Nobody knows the unknown but it's our daily actions, our collaboration, and joint mission to drive connectivity and leverage it towards spurring business and opportunities to the world that will make a difference.

I also find it truly motivating to be surrounded by such a passionate and talented team, and I am confident that we will accomplish great things together.

During the first half of the year, Ericsson has been actively collaborating with industry players in the GCC region. How will this impact the company's footprint and continuous success in the region?
At Ericsson, we are on a mission to build a world where digitalization is
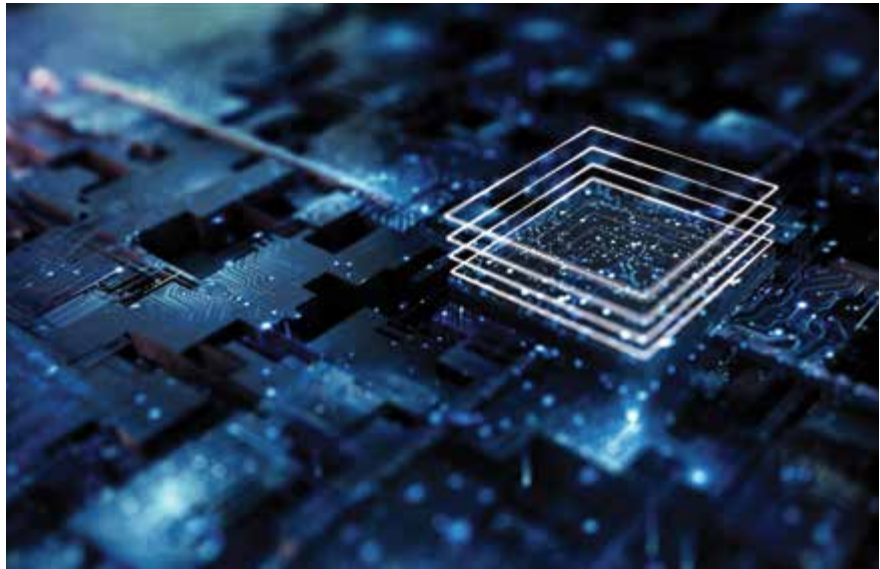
transforming the ecosystem, driving sustainable development, and creating opportunities for all. We have been connecting the MEA region for over 100 years and have built wireless networks for every generation—from early 1G networks to advanced 5G networks.

In Saudi Arabia, we demonstrated the world's first deployment of automated radio resource partitioning (ARRP) on a 5G standalone (5G SA) network slice in partnership with stc. This pioneering advancement improves resource allocation efficiency and user experiences, enabling the communication service provider (CSP) to harness the full benefits of 5G-Advanced capabilities. We also achieved the highest data uplink speed worldwide in terms of 5G New Radio Dual Connectivity (NR-DC) gNB in a live network environment. Together, we are building a ready-to-deploy ICT network for 2030 that will be able to provide connectivity for mega events set to take place in the Kingdom, such as Expo 2030 and the 2034 FIFA World Cup.

At LEAP 2024, we signed a memorandum of understanding (MoU) with Etihad Etisalat (Mobily) to boost its 5G network capabilities through customizable application programmable interfaces (APIs). This initiative will leverage our dual-mode 5G Core, enhancing service programmability for enterprises and developers in Saudi Arabia while

supporting innovative use cases, like Quality on Demand (QoD).

We also entered another agreement with Mobily to drive network evolution in Saudi Arabia using Open RAN principles with a focus on 5G implementation. This collaboration explores opportunities for flexible network segmentation between purpose-built RAN and Cloud RAN, identifying optimal locations for Cloud RAN deployment to boost network flexibility and efficiency.

Furthermore, we are working on a joint Gaming Research Lab with King Abdulaziz City for Science and Technology (KACST) in Riyadh. The initiative seeks to foster a culture of innovation, creativity, collaboration, and entrepreneurship to unlock Saudi Arabia's technological and economic potential.

Earlier this year, we completed the first 5G trial in Egypt in partnership with Telecom Egypt, covering key spots in the country's New Administrative Capital. Furthermore, we collaborated with Vodafone Egypt to modernize and expand the capacity of its mobile network by introducing Ericsson's triple-band radio 4466 which reduces tower load, shortens deployment time, and supports sustainability efforts through lower energy consumption. We also supported Moov Africa Bénin in handling the data flow for around 45,000 attendees at the WeLovEya

music festival in the city of Cotonou in Benin. In addition, we joined forced with MTN Uganda to boost financial literacy for women entrepreneurs in Kampala. The initiative aimed to drive financial and gender inclusion and empower African women to reach their full potential.

In the UAE, we secured several new achievements in collaboration with e&. For example, we established a strategic partnership to elevate its 5G capabilities through the modernization of charging systems. The upgrade resulted in a significant enhancement by introducing over 85 new features, including differentiated charging for innovative services, such as Voice over New Radio (VoNR) and Video over New Radio (ViNR), ultimately improving customer experience and operational efficiency.

Together with e& UAE, we also successfully conducted a 5G data call using our Cloud Radio Access Network (RAN) architecture in a lab environment. This was one of the first Ericsson Cloud RAN demonstrations worldwide and the first of its kind in the MEA region.

More recently, the successful implementation of our Reduced Capability (RedCap) software solution on e& UAE's 5G standalone network— the first in the MEA region and one of the first in the world—marked a significant milestone in Internet of Things (IoT) expansion. This innovative solution allows for the development of a wider array of IoT devices by reducing complexity and enhancing battery life, thus, unlocking new monetization opportunities for various applications.

In line with the UAE's digital transformation initiatives, we embarked on a partnership with du to provide private 5G networks for the government and enterprise sectors in the country. This collaboration facilitates the integration of Industry 4.0 technologies and smart services, significantly advancing digital capabilities across various sectors.

Together with du, we conducted a trial with 10 aggregated carriers on their 5G standalone network, attaining remarkable download speeds of up to 16.7 Gbps. This landmark achievement showcases the potential for enhanced fixed wireless access (FWA) experiences and opens new avenues for applications in augmented reality/virtual reality (AR/VR) and cloud gaming.

In addition, we formalized a multi-year global patent cross-license agreement with OPPO that includes essential patents for cellular technologies, including 5G. The move fosters collaboration on numerous 5G-related projects, enhancing our joint efforts to develop the UAE's telecom landscape.

In Oman, we started the year by conducting the full migration of Ooredoo's prepaid and postpaid subscribers to our consolidated online charging and mediation system, empowering the CSP to provide its customers with a next-level digital experience. We also closed a mobile broadband deal with Omantel to help the CSP expand, transform and modernize its 4G RAN network and pave the way for 5G growth. Our latest project involved upgrading Vodafone Oman's core and cloud with the aim of preparing the CSP to deploy 5G standalone and 5G services to its consumer and enterprise customers.

Going forward, we will continue to play a crucial role in building networks of the future across the GCC. Driven by the nations' national visions, digitalization plays a central role in enabling those visions and we are proud to partner with our customers (the CSPs) to realize the full potential of digitalization in the different countries we operate across the GCC and

beyond. Our dedication to excellence and proactive engagement positions us as a pivotal driver of transformation in the telecommunications industry and a key contributor to building a connected and sustainable future for all.

The MEA region is one of the most dynamic and technologically advanced areas in the world. How will Ericsson maximize this potential and leverage it for long-term growth?
With its commitment to digital transformation and economic diversification, reflected in ambitious national initiatives, such as We the UAE 2031 and Saudi Arabia's Vision 2030, coupled with the growing broadband internet access in Africa, the MEA region is witnessing increased demand for robust telecommunications infrastructure.

As the region's telecom sector develops, customers expect solutions that not only meet current requirements but also anticipate future needs. Thanks to our early and significant investment in R&D, around 19 percent of Ericsson's annual global revenue is invested in research and development (R&D), totaling tens of billions of dollars over the past few years. Ericsson has the world's leading patent portfolio in cellular technology, with more than 60,000 granted patents and over 100 signed licensing agreements. This is a crucial element to enable faster innovation in the market and to continue supporting our customers and the development of societies with the right innovation.

We shall continue to innovate, leveraging AI, automation, and strategic investments to stay competitive while solving our customers' specific challenges and addressing their evolving expectations. Our primary focus is on enhancing the accessibility and affordability of communication infrastructure while driving sustainable economic growth.

Through our technology and expertise, we are implementing new (and expanding existing) programs to help tackle some of the most pressing issues of our time, including climate change and inequality.

By leveraging a future-oriented mindset and keenness to embrace the latest technologies, I believe that the MEA region is, and will, continue to serve as a key innovation hub for us, our customers, and our partners.

Despite the progress, what are the technology and innovation gaps within the region that Ericsson will continue to address moving forward?
One of the most significant trends in the MEA region is the rapid adoption of technology and innovation across various industries. The technology sector, in particular, has experienced substantial growth, with countries like the GCC and South Africa leading the way. Investments in new technologies like artificial intelligence, cloud and cybersecurity are on the rise, creating a fertile ground for startups and established companies alike.

At the same time, we are currently seeing a widening gap in terms of companies' digital transformation ambitions and readiness to translate these ambitions into reality, and this is of course driven by many factors be it macroeconomic challenges delaying investments in the sector or

lack of ecosystem collaboration to spur innovation. Collaboration is key considering the pace and breadth of change; things are moving fast and on several fronts.

We believe that we can play a role in addressing those gaps. As the MEA region embraces the digital era, digital literacy is crucial, and it will spur innovation. Many in the current workforce require continued efforts to upskill the new generation and build Industry 4.0 expertise. To advance our efforts in this space, we launched our flagship digital education program, Connect To Learn, in 2010. To date, we have provided access to digital learning and skills development programs for 485,000 children and young adults in 43 countries.

Ericsson partnered with the United Nations International Children's Emergency Fund (UNICEF) and was the first private sector partner to make a multimillion-dollar commitment to Giga. The Giga initiative—a partnership between UNICEF and the International Telecommunication Union (ITU)—aims to connect every school in the world to the internet by 2030 to help bridge the

digital divide. We recently celebrated the closure of the project together with UNICEF in Kenya. In addition, we extended our global skills program to Africa in cooperation with the Smart Africa Digital Academy (SADA) to offer digital upskilling opportunities to 100 policymakers and regulators from 19 countries.

To foster innovation, we recently launched the Flash Forward Hackathon in Saudi Arabia in partnership with stc, Vonage and King Saud University. Empowering young talent to actively participate in achieving the goals of Saudi Vision 2030, the initiative aims to support the development of digital infrastructure, promote the adoption of advanced technology and drive research and innovation.

In the UAE, we recently kicked off the Excelerate& Program in collaboration with e&, which seeks to develop local tech talent. The initiative provides young Emiratis with exposure to global best practices and cutting-edge technologies, enabling them to master telecom technology, foster a culture of innovation and maximize learning opportunities. This way, we are inspiring a new cohort of leaders to carry on our legacy of excellence. The educational sessions conducted by our experts at Ericsson will culminate in a two-day visit to our headquarters in Stockholm—an invaluable opportunity to experience the epicenter of innovation firsthand.

In Oman, we have joined forces with Vodafone to build digital skills among local youth in line with the sustainable development goals (SDGs) of Oman Vision 2040. We are leveraging the Ericsson Educate online platform to provide young talent with access to learning material on advanced technologies. The self-paced digital skills portal features a wide variety of learning material on key technologies, such as 5G, AI and machine learning (ML), automation, blockchain, cloud computing, data science, IoT and telecommunications.

At the regional level, we introduced the Ericsson Gen-E Graduate Engineer Program, tailored for Market Area Middle East and Africa (MMEA). Gen-E, short for Generation Ericsson, has been designed to hone the technical skills of engineering graduates through comprehensive training on our technology, solutions, and delivery methods, alongside the knowhow of our processes, tools and methodologies.

In your opinion, will 5G/5G-Advanced adoption accelerate in the MEA region? What are the key contributors to achieving a full transition?
Yes, absolutely. According to the

latest edition of the Ericsson Mobility Report, the Middle East and North Africa (MENA) region is poised for the most rapid growth in 5G subscriptions with a projected annual increase of 51%. By 2029, 5G is expected to dominate the market with a 50% share of total subscriptions. Meanwhile, 5G subscriptions in Sub-Saharan Africa are anticipated to exceed 320 million, accounting for 28% percent of all mobile subscriptions by 2029.

This accelerated adoption is a result of expanding network coverage and the availability of more affordable 5G-enabled smartphones. Among other key factors driving this trend are regulatory reforms that encourage investment in the telecom sector and promote competition within the region. In addition, several industry players are already taking steps to apply AI-powered tools across a variety of use cases.

Given the high demand from businesses and consumers, what are the top challenges and opportunities for telcos in the MEA region? How is Ericsson responding to these demands and opportunities?
The main challenges across the region include ensuring seamless 5G integration, providing access to FWA in areas with limited fiber infrastructure, and keeping pace with rapid technological advancements.

In Africa, we are facing a specific set of challenges. The main issue here is the lack of adequate ICT infrastructure, especially in rural areas. This challenge varies across countries due to factors such as income disparities, regulatory environments, geographical size, political instability, and population density. Income disparities affect affordability, while regulatory policies impact investment and competition. Geographical size and distribution of the population can make infrastructure deployment difficult. Political instability and governance play a crucial role, as do digital literacy and education. Economic development influences resource allocation. Addressing these challenges through infrastructure development, regulatory reforms and digital literacy programs is crucial for improving connectivity rates across the continent.

Another challenge is intermittent power supply, which, once again, is the most prominent in rural areas. At Ericsson, we firmly believe that embracing the latest 5G technology is pivotal in curbing energy costs and breaking the energy curve. To initiate this process, we place high focus on modernizing hardware. The latest equipment can yield remarkable benefits, including a ten-fold improvement in capacity and more than 30% in energy savings. Additionally, implementing 5G's energy-saving software can bring considerable gains.

We are actively engaged in the development of intelligent RAN, energy-saving software features. These innovations enable operators to achieve marked reductions in energy consumption while optimizing network performance. Through efficient monitoring and AI-supported tracking, we have identified areas for optimization, which can result in up to 12% annual reduction in RAN energy use.

Given the increasing demand for 5G capabilities, we have seen a significant opportunity arising from the similarity in the air interface shared by 4G and 5G technologies. This similarity allows for a more efficient repurposing of spectrum compared to other technologies. We are currently focusing on assisting CSPs in reusing their 4G spectrum for 5G deployments through the Ericsson Spectrum Sharing (ESS) solution.

While all eyes are on 5G at the moment, 6G is already waiting in the wings. We are conducting intensive research into 6G networks in partnership with the Scientific and Technological Research Council of Türkiye (TÜBİTAK) and King Abdullah University of Science and Technology (KAUST) in Saudi Arabia.

One facet that presents a challenge as well as an opportunity is addressing the escalating capacity requirements of mobile networks in many markets that come with the exponential growth of mobile data consumption. Long-haul microwave links are ideal for high capacities at longer distances and fit well with the need to connect rural areas.

Ericsson is committed to pioneering a connected and sustainable world. What role does 5G play in advancing the company and the MEA region's sustainability goals?
At Ericsson, we believe that ICT can empower other industries to move towards the low-carbon economy. According to Ericsson research, the sector has the potential to reduce total industrial emissions worldwide by up to 15%, even though it is responsible for only 1.4% of the global carbon footprint.

In this context, 5G technology has become a critical enabler of sustainability across industries. With their energy-efficient design, 5G networks optimize infrastructure, reduce operational costs and lower carbon emissions for telecom operators. We continue to work closely with stc, e&, and Zain Group to integrate advanced 5G technologies that not only enhance connectivity but also contribute to energy efficiency and environmental sustainability, positioning these operators as leaders in the transition toward a more sustainable digital future.

In our "Breaking the Energy Curve" report, Ericsson offers updated advice to communications service providers (CSPs) about how they can become more energy-efficient, sustainable, and cost-effective as they scale with 5G, while also achieving their business goals and sustainability targets.

Our ongoing R&D efforts underscore the transformative potential of 5G in advancing sustainable business practices. Innovations like our triple-band, tri-sector radio significantly cut down on energy consumption and minimize site footprints, offering cost-effective solutions that align with environmental goals.

Through collaborations with our customers across the region, we shall continue to drive initiatives aimed at achieving Net Zero emissions and fostering climate action. **TR**

Umniah: Fortifying Defenses Against Cyberattacks in Jordan

In today's digital age, the cybersecurity landscape is constantly evolving, with new and more sophisticated threats emerging every day. As cyberattacks become increasingly complex, organizations worldwide are facing mounting challenges in protecting their data and networks.

Iyad Jabr, Chief Business Officer, Umniah

In an exclusive interview with Telecom Review, Iyad Jabr, Chief Business Officer, Umniah, delved into the rising costs of data breaches, the most effective strategies to secure defenses, and the unique challenges organizations face in navigating the fast-paced world of cybersecurity.

Industry reports show an uptick in data breach costs for organizations globally, with the average breach in 2023 accounting for USD 4.45 million—a 2.3% increase from 2022. What does this development reflect about the changing cyber threat landscape?
The rise in data breach costs, now averaging USD 4.45 million in 2023, reflects the increasingly complex and dangerous nature of the global cyber-threat landscape. This increase is due to several significant factors. First and foremost, cyberattacks have grown more sophisticated, with criminals employing advanced methods that make it challenging for organizations to defend against these threats and mitigate risk. The value of data continues to rise, turning it into an even more lucrative target for cybercriminals.

Additionally, evolving regulations such as the National Data Privacy Law

and the GDPR have imposed stricter compliance requirements. These regulations come with heavier fines, thereby increasing the financial burden on organizations in case of a breach. The surge in ransomware attacks is also a driving force behind the rising costs, as these incidents often involve extortion and financial loss. A shortage of skilled cybersecurity professionals further exacerbates the situation, as many businesses struggle to find and maintain the right talents to safeguard their systems.

Given these complexities, organizations must prioritize cybersecurity now more than ever. A robust security strategy, frequent updates in compliance with international frameworks, zero-trust access controls, and regular employee training are essential. Companies should also conduct security assessments and have a well-prepared incident response plan to mitigate the impact of potential breaches, which directly impact their businesses and brand's reputation.

What are the best cybersecurity strategies that public and private organizations can implement to secure their defenses? What are the most common challenges for such goals, and how can Umniah help?
For public and private organizations

aiming to strengthen their cybersecurity defenses, implementing a comprehensive security strategy is paramount. This involves robust access control systems that include multi-factor authentication, strong password policies, and role-based access control. Equally important is providing ongoing cybersecurity awareness training for employees, as human error remains one of the weakest links in organizational security. Another essential approach is adopting a zero-trust security model, where no user, whether inside or outside the organization, is trusted by default, and continuous verification is enforced.

Regular security assessments are necessary to identify vulnerabilities, and businesses should be vigilant in keeping up with the latest cybersecurity threats. Having a well-defined incident response plan is also critical in ensuring quick and effective action when breaches occur.

However, achieving these goals is not without its challenges. Many organizations face budgetary constraints that limit their ability to invest in the latest security technologies. There is also a shortage of cybersecurity skills in the market, making it difficult to find qualified professionals to maintain and manage security strategies. Many businesses still rely on adopting the

most needed technologies, which present vulnerabilities and gaps to fulfill the strategies that modern cybercriminals can easily exploit. Additionally, organizations often grapple with internal cultural issues that hinder the adoption of stronger security practices. Finally, compliance with the ever-evolving regulatory landscape adds another layer of complexity to managing and operating security controls.

Umniah offers a wide range of solutions to address these challenges, from managed security services to security consulting, assessment, and incident detection and response. Umniah also provides threat intelligence and specialized security training to help organizations stay ahead of the latest cybersecurity risks and trends.

Please tell us about Umniah's Security Operations Center's (SOC) core offerings and how it is helping organizations in Jordan build a robust defense against cyberattacks.
Umniah's Security Operations Center (SOC) plays a crucial role in helping organizations across Jordan fortify their defenses against cyberattacks. One of the key services offered is 24/7 monitoring and alerting, ensuring that any unusual activity or potential threats are identified and addressed in real time. The SOC also provides security events and logs management and analyzes these logs based on the enterprise nature of business and international frameworks to detect anomalies that could signal a breach. In the event of an incident, Umniah's incident response and management services enable swift action to mitigate the risk. The roadmap's focal point is being developed regularly with a clear path to introduce the first Managed Detection and Response (MDR) center in Jordan.

Threat intelligence is another vital component, as it helps organizations stay ahead of emerging cyber threats by continuously analyzing and sharing insights on potential risks. Umniah's SOC also offers a "clean pipe" service, which includes protections like Anti-DDoS, advanced Web Application Firewall-as-a-Service (WAFaaS), and Next Generation Firewall-as-a-service (NGFWaaS). Vulnerability

assessments and penetration testing, along with other information security assessment services, are provided to identify weaknesses in systems and prevent attackers from exploiting them. Additionally, Umniah offers information security consultancy and advisory services to help businesses develop a robust cybersecurity framework and strategy. Detailed reporting is provided to clients, offering a clear picture of their security posture and areas for improvement.

By offering such a comprehensive suite of services, Umniah's SOC helps businesses stay proactive in their defense strategies, minimizing risks and strengthening their overall cybersecurity infrastructure.

Shortage of the right talent is a practical challenge when it comes to cybersecurity. In what ways is Umniah addressing this critical issue?
The shortage of skilled cybersecurity professionals is a pressing challenge, particularly in Jordan. To tackle this issue, Umniah has developed a resilient organizational structure that allows different teams to step in and cover for each other when necessary. This cross-training approach ensures that no single team is overwhelmed or under-resourced in times of need. Umniah also invests heavily in continuous training and knowledge transfer programs, ensuring that employees are always up-to-date with the latest industry practices and technologies.

Additionally, Umniah has initiated a Fresh Graduate Training Program in partnership with local universities and the Jordan Engineers' Association. This program provides practical training and mentorship to new graduates, helping to bridge the skills gap and prepare the next generation of cybersecurity professionals. By addressing the talent shortage through education and internal resilience, Umniah is ensuring that its team remains capable of delivering top-tier cybersecurity services.

In a fast-evolving technological landscape, how does Umniah maintain a competitive advantage over its competitors in the cybersecurity market?

In the rapidly evolving field of cybersecurity, maintaining a competitive edge requires constant adaptation and innovation. Umniah stays ahead of the curve by regularly reviewing and updating its cybersecurity strategy and roadmap. This ensures that the company remains responsive to new threats and technological advancements. Continuous education and skill development are key components of this strategy, as the team must be prepared to tackle emerging challenges.

Proactive threat intelligence and analysis also play a critical role in Umniah's approach, enabling the company to anticipate risks and act swiftly. Umniah's incident response capabilities are designed to be robust, allowing for quick and effective action in the event of a breach. Additionally, Umniah has built strong partnerships with various cybersecurity vendors, industry peers, regulators, and the broader cybersecurity community. These relationships allow Umniah to leverage the latest technologies and insights, ensuring that it remains a leader in the cybersecurity market.

By combining a forward-thinking strategy with strong partnerships and continuous improvement, Umniah is well-positioned to maintain its competitive advantage and deliver top-notch cybersecurity solutions.

As the cyber threat landscape grows more intricate and dangerous, organizations must remain vigilant and proactive in their cybersecurity efforts. Umniah's comprehensive approach, from its around-the-clock Security Operations Center to its emphasis on continuous talent development, highlights the company's commitment to fortifying Jordanian businesses against cyberattacks. By offering cutting-edge solutions, fostering collaboration, and staying ahead of industry trends, Umniah is playing a pivotal role in shaping a safer digital future. As the conversation around cybersecurity continues to evolve, one thing remains clear: organizations must prioritize resilience and adaptability to protect themselves in an increasingly connected world. **TR**

Noman Waheed,
CTO for Middle East, Nokia

Nokia: Unlocking the Middle East's Full Potential as a Thriving Tech Hub

In an exclusive interview with Telecom Review, Noman Waheed, CTO for Middle East, Nokia, shared details regarding the state of technological progress across the MEA region, the importance of collaboration, the impact of the 5G-Advanced revolution, and Nokia's strategy for leveraging MEA's potential.

Given Nokia's wide presence within the Middle East, which particular areas have the most promising technological integration? Which areas require more innovation?

Nokia's extensive presence across the Middle East is helping drive digital transformation in various sectors. However, some areas show more advanced technology integration, while others still need to be boosted for further innovation.

The Gulf Cooperation Council (GCC) countries are leading in 5G rollouts, with the UAE and Saudi Arabia having some of the highest 5G adoption rates globally.

We also see a strong push towards private 5G networks as CSPs look to explore additional revenue streams. Sectors like oil and gas, logistics, smart ports and manufacturing can benefit by using private 5G networks to drive efficiency, safety, and automation.

The Middle East has tremendous potential for further innovation, with promising areas like smart cities, telecom infrastructure, private networks and energy already experiencing high levels of technology integration. Nokia's continued investments in 5G, IoT (RedCap), automation, AI/ML, energy efficiency (as part of ESG), and cloud technologies, along with strategic partnerships across industries, can help unlock innovation and further propel the Middle East as a global technology leader.

The UAE is pioneering the use of mmWave technology. How does Nokia's FastMile FWA product cater to this demand, and how can it be further utilized in the coming years?

The UAE is among the first country in Middle East to allocate mmWave spectrum to CSPs for 5G commercial deployments. mmWave spectrum is valuable as it can provide up to 3 GHz of spectrum that can be used for deployments by the CSP to address demands for consumers and private users (private networks).

5G Fixed Wireless Access (FWA) has been highly successful, connecting millions worldwide with mid-band 5G. The Nokia FastMile 5G mmWave Receiver enhances this by overcoming challenges like signal attenuation, obstructions, and line-of-sight limitations. Its advanced antennas and intelligent algorithms enable connectivity from any direction, even in non-line-of-sight conditions, making mmWave broadband accessible in more scenarios.

How important is 5G collaboration beyond evolution? What characteristics does Nokia look for in a partner and potential solutions as a leading telecom vendor in today's age?
There is an African proverb that goes, "If you want to go fast, go alone; if you want to go far, go together."

Collaboration is crucial in the evolution of 5G and beyond due to the complexity and scope of next-generation networks. No single company can address all the technological, operational, and regulatory challenges associated with 5G on its own.

Collaboration among telecom vendors, cloud providers, application developers, and industry players is essential to create a broad ecosystem that leverages 5G's full potential. Moreover, collaboration among industry players, regulatory bodies, and standard-setting organizations is critical to ensure that 5G networks are interoperable globally.

The evolution to 5G and beyond (6G) demands massive investments in research and development (R&D). Collaborative efforts between telecom vendors, universities, startups, and industry bodies foster innovation in areas such as AI, edge computing, network slicing, and low-latency applications.

Nokia is working closely with regulators across Middle-Eastern countries to achieve their spectrum outlook and strategy.

As a leading telecom vendor, Nokia's collaborative approach focuses on building a strong partner ecosystem

that accelerates innovation and ensures seamless 5G deployments. Some of our key partner characteristics and solutions include:

Cloud-Native and Open Architecture Partners: Nokia works with cloud-native infrastructure providers like AWS, Google Cloud, and Microsoft Azure to build flexible, scalable 5G solutions. These partnerships enable cloud-based network services, allowing for more efficient network management, faster deployment, and innovation in edge computing.

Enterprise and Industry Verticals: Nokia partners with enterprises in various verticals to develop industry-specific solutions like private 5G networks, mission-critical applications, and automation systems. These collaborations help enterprises leverage 5G for greater efficiency and innovation.

Open RAN and Standardization Partners: As a strong advocate of Open RAN (O-RAN), Nokia works with technology partners to ensure an open, interoperable network architecture. This collaboration drives competition and innovation while reducing dependency on single-vendor solutions.

R&D and Innovation Partners: Nokia collaborates with research institutions and universities to develop future network technologies like 6G, AI-driven network management, and quantum computing. This helps position Nokia

at the forefront of telecom innovation, ensuring its solutions remain cutting-edge.

In conclusion, Nokia's extensive partner ecosystem, characterized by a focus on innovation, openness, security, and interoperability, ensures that it remains a key player in the global telecom landscape.

From your perspective, how will 5G-Advanced continue to impact the networks in the Middle East?
The 5G-Advanced evolution continues through Release 19 and beyond. Often seen as the next evolutionary step in 5G, this technology will significantly impact networks in the Middle East by enhancing capabilities, driving innovation, and opening new opportunities across industries.

Aligned with this, we've been engaging with multiple operators across the region, including du, to test 5G-Advanced capabilities like Reduced Capability (RedCap) for 5G IoT; and Etisalat by e&, to explore MEA's first Cloud RAN trial based on Nokia AnyRAN solution.

As pictured in Figure 1, 5G-Advanced is expected to offer improved **Experience** for people and machines, **Extensions** for new use cases, and **Expansions** to offer new services beyond pure communication. This is powered by innovations that provide operational **Excellence.**

Figure 1

The domain of enhanced Experience aims to lift 5G end-user experience to the next level, including better support for extended reality (XR), further development of MIMO, and improvements in mobility and flexible duplexing.

The Extensions domain aims to extend the reach of 5G connectivity and make it available to new market segments while the Expansions domain targets the expansion of 5G services beyond traditional communication. By introducing enhanced positioning with sub-10cm accuracy consistently both indoors and outdoors, as well as time synchronization as a service, it offers valuable benefits for diverse use cases.

5G-Advanced will be powered by operational Excellence that aims to enhance and optimize the 5G platform and its operation through the gradual introduction of artificial intelligence (AI) and machine learning (ML) enablers, network slicing enhancements, wireline and wireless convergence, network coordination and energy efficiency enhancements.

What makes the Middle East a thriving technology ground, and how will Nokia continue to maximize the region's potential for the rest of 2024 until 2025?
The Middle East's combination of visionary leadership, robust infrastructure investments, and a tech-savvy population make it an ideal environment for continued technological innovation. As a leading telecom vendor, Nokia is well-positioned to help the Middle East achieve its technology goals by leveraging its portfolio of 5G, cloud, and AI-driven solutions, supporting the region's ambitions through 2024 and 2025.

By focusing on expanding networks, fostering smart cities, supporting industrial transformation, and advancing sustainability, Nokia will help unlock the full potential of the Middle East as a thriving technology hub.

Visionary Government Initiatives: Many countries have launched ambitious digital transformation plans. Saudi Arabia's Vision 2030, for example, aims to foster a digital economy and create a robust technology sector. The UAE has similar initiatives focused on artificial intelligence, blockchain, and 5G.

Nokia's Smart City offerings, such as smart lighting, traffic management, and public safety, will be integral to the success of projects in the Middle East.

Strong Investments in 5G and Telecom Infrastructure: The Middle East is one of the fastest-growing regions for 5G deployments. The UAE is leading Ookla's rankings of the fastest 5G download speeds in the world. Governments in the region are actively working with telecom operators and vendors such as Nokia to ensure the efficient allocation of spectrum and the smooth deployment of new technologies. This creates a fertile environment for telecom innovation.

Nokia's AirScale Radio Access solutions are designed to help operators scale their networks while improving efficiency and performance.

High Demand for Advanced Digital Services: The Middle East has a large (and growing) population of young, tech-savvy consumers who demand the latest in mobile services, entertainment, and e-commerce. This trending demographic drives innovation and the adoption of new digital services.

In response, Nokia will enhance network automation across the region with AI-driven solutions, enabling telecom operators to manage complex networks more efficiently. This will be crucial for handling the growing number of connected devices and high data demand.

Innovation in Energy and Sustainability: The region is also focusing on diversifying its economy and addressing sustainability challenges. Governments are investing in renewable energy and smart grid technology as part of their sustainability goals. This creates opportunities for technology companies to provide solutions in energy management, IoT, and green technology.

Nokia offers energy-efficient network solutions to reduce the environmental impact of telecom infrastructure, while helping operators meet their sustainability targets.

Investing in Skills and Innovation: Nokia is supporting the region's talent development initiatives by collaborating with local universities, startups, and governments on innovation programs, research, and development. This will be key to ensuring that the Middle East can sustain its growth as a tech hub.

As part of Nokia's commitment to the region, we recently launched the Open Innovation Lab in the UAE, aiming to drive regional innovation and accelerate the adoption of new technologies such as AI/ML for network automation and optimization in the MEA region. **TR**

> **Nokia is well-positioned to help the Middle East achieve its technology goals by leveraging its portfolio of 5G, cloud, and AI-driven solutions, supporting the region's ambitions through 2024 and 2025**

Tamer Bdran, Senior Vice President, Business Unit Head
Telecom Services, Digital Government & MD of UAE Office, NEC

Change with a Purpose: Reflections from Tamer Bdran and NEC GCC's Journey of Transformation

Change is the driving force behind meaningful evolution, and it is through change that NEC GCC has continued to carve out its presence in the region. In this context, Telecom Review conducted an exclusive interview with Tamer Bdran, Senior Vice President, Business Unit Head Telecom Services, Digital Government & MD of UAE Office, NEC.

NEC is celebrating its 125th anniversary with a focus on "creating what's ahead." How is this reflected in its Middle East operations, particularly in the GCC?

In July 2024, the NEC Corporation celebrated its milestone anniversary of 125 years, however, we have been operating in the region for more than 40 years. We have built a proud history in cooperation with our customers, partners, shareholders, employees and all our stakeholders.

Today, we continue to move forward with our stakeholders and strive to be a company that is essential for society.

We express our gratitude to all our stakeholders with whom we have built our history together. Since our inception, we have been delivering new value to society by leveraging the most advanced technologies of each era and adapting as we go.

Today, we utilize a wide variety of advanced technologies, including biometric authentication, AI technologies, cybersecurity solutions, and networks. By combining these technologies, we are promoting digital transformation (DX) for our customers and society.

Telecommunications technologies have been at the core of our history, but our corporate image has always been evolving. It is precisely because we have continued to change what we are and where we are today—and that corporate identity will never change.

How important is NEC's contribution to advancing the digital transformation of customers and communities within the GCC?

NEC Corporation started by importing telecommunications equipment, then adopted it, and through research and development (R&D), introduced advanced technologies and began to produce a variety of equipment in-house.

Through the vision, "Better Products, Better Services," our founders in Japan contributed to the development of modern society in the field of telecommunications. The second phase of the company's evolution as an information and communications technology (ICT) company began in 1977.

NEC has been contributing to the development of ICT around the world through technologies that have included personal computers, semiconductors, cell phones, and other products.

Today, as we accelerate DX for our customers and society through various advanced technologies, we are transforming into a company that creates social value and must be defined as more than just a manufacturer or system integrator.

In the GCC, our breakthrough occurred through partnerships with telecom companies and major digital government projects in the UAE and Saudi Arabia. We have aligned our digital transformation vision with major telecom companies and government entities in the region. Some of the major projects we are currently deploying are touching the lives of every individual in the region.

NEC has been recognized for its robust sustainability strategy and execution. What are the key initiatives being implemented within the GCC that align with this?

NEC encapsulates the social values of safety, security, fairness, and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential.

NEC GCC has reshaped its organizational structure, accelerated investment in promising business fields, implemented data-driven management, expanded its diversity, changed its internal culture, and promoted its own DX using the most advanced technologies. Through the constant information sharing among various NEC subsidiaries, NEC GCC has developed the know-how, human resources, and technology for corporate transformation, including DX.

Change is the driving force of meaningful evolution, and it is through change that NEC GCC has continued to carve out its presence in the region. With our robust strategy and execution, we are confident that this will lead us to a meaningful period of creation in the future. **TR**

> *Today, we continue to move forward with our stakeholders and strive to be a company that is essential for society*

AI-Powered CapEx: Smarter Investments for Telecom Operators

In today's fast-paced telecommunications environment, operators face more than just the challenge of maximizing return on investment (ROI); they must do it at the right time and place. A solid ROI is crucial, but achieving it efficiently and smartly has become a critical factor for success, particularly with investments in technologies like 5G and edge cloud.

At YUVO, our Smart CapEx approach leverages all the available network data (configuration, control plane, and user plane data) through our Network Intelligence tool to enable timely decisions that ensure a consistent ROI, while still modernizing infrastructure.

The Smart CapEx Process

Our Smart CapEx solution begins with exploratory data analysis, ensuring that all data points across cells and KPIs are complete. During this exploration, we often encounter the following issues:

- **Limited Scope:** Historical data is often insufficient.
- **Outliers:** Spikes in data can skew results.
- **Missing Data:** Some KPIs may lack complete information.
- **Inorganic Shifts:** Unexplained changes in data may arise, affecting forecasts.

Once identified, we address these issues in different ways:
For missing or null data, if the gaps are small, we apply polynomial interpolation to fill them by using natural variations in the real data. If the amount of missing data is too large, we may exclude the affected cells or KPIs from further processing to maintain data integrity.

Inorganic shifts in the data, such as abrupt changes that could stem from configuration adjustments or specific network conditions, require close collaboration with the customer to understand their cause. To address these shifts, we scale the historical

data pre-shift to normalize it and drop unreliable data points. We then re-fill any missing data using tools like the FEDOT library's ModelGapFiller component.

Data Spikes are another common challenge that can distort predictions. To mitigate their impact, we apply convolutional smoothing techniques. This reduces the noise in the data and helps the forecasting models perform more accurately.

Our Smart CapEx solution is built on two key components: a predictive system and a prescriptive system.

Predictive System

The predictive component analyzes historical data to forecast future network demands. It takes into account trends, seasonality, and external factors,

allowing for more accurate long-term projections.

- **Trend Analysis:** Identifies consistent growth patterns, such as a 5% annual increase in traffic that might indicate the need for additional capacity within six months.
- **Seasonality:** Takes into account temporary spikes in usage, like a 20% rise in data demand during holidays or tourist seasons.
- **External Factors:** Accounts for market disruptions, events, and other external variables that may influence network usage.

The model's accuracy improves over time as it learns to recognize patterns in the historical data. During training, it adjusts internal weights and parameters to minimize errors between predicted and actual outcomes, continuously refining its ability to provide reliable forecasts.

Selecting the right model is crucial, as no single model fits all scenarios. YUVO's Smart CapEx solution automates this process by allowing multiple models to compete, selecting the one that best fits the unique data patterns of each network site. This ensures that operators receive the most reliable forecast for every specific network element.

Prescriptive System

After forecasting future demands, the prescriptive system helps operators determine the best course of action by solving a mathematical optimization problem. Its goal is to maximize objectives such as return on investment (ROI) or network performance while adhering to operational and investment constraints like budget limits, regulatory requirements, and capacity constraints.

Given the complexity and number of possible investment decisions, our optimization models help operators navigate these decisions, recommending optimal scenarios.

Integrated Dashboards for Actionable Insights

Our Smart CapEx solution provides three key dashboards, each tailored to different aspects of the decision-making process:

Figure 1 - YUVO Smart CapEx - Executive Dashboard
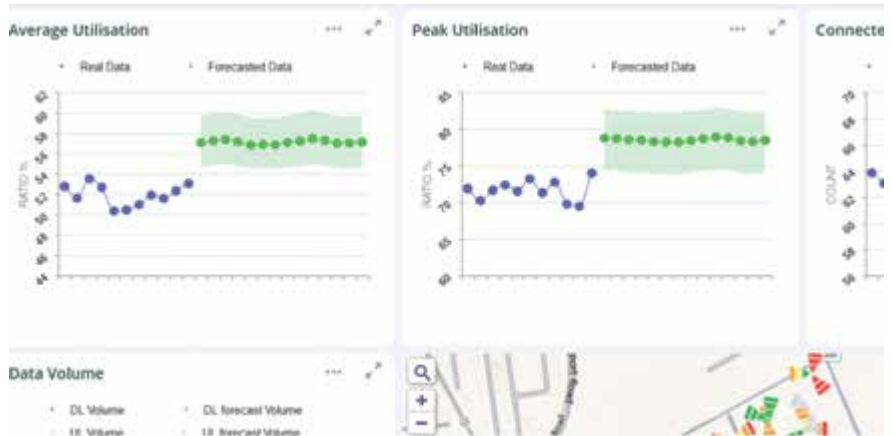
Figure 2 - YUVO Smart CapEx - Technical Dashboard

Figure 3 - YUVO Smart CapEx − Financial Dashboard

1. **Executive Dashboard:** Offers a high-level overview of network performance and investment opportunities, including both real and forecasted revenue per cell. This dashboard integrates geographical information, allowing users to easily pinpoint areas with better investment potential.
2. **Technical Dashboard:** Provides detailed insights at a granular level, including real-time and forecasted data on metrics such as average and peak utilization, connected users, and data volume.
3. **Financial Dashboard:** Identifies top and underperforming sites and cells, highlighting recommended actions for improving ROI.

With YUVO's Smart CapEx solution at their disposal, telecom operators can leverage cutting-edge technology to make smarter infrastructure decisions, ensuring high ROI while advancing their network capabilities. **TR**

Huawei Accelerates Industrial Digitalization and Intelligence at GITEX Global 2024

Huawei, a leading global provider of information and communications technology (ICT) infrastructure and smart devices, will participate as a Diamond Sponsor at GITEX Global 2024, taking place in Dubai from October 14th to 18th.

Under the theme "Accelerate Industrial Digitalization and Intelligence," Huawei will showcase its latest innovations and engage with industry leaders to explore the transformative power of intelligent technologies.

A Showcase of Innovation and Collaboration

Spanning over 1,400 square meters, the Huawei booth (B10 and B20) in Hall 22 will offer visitors a firsthand look at the company's vision for an intelligent future. The booth will feature two key areas:

- **Industrial Digitalization and Intelligence:** This area will showcase Huawei's reference architecture for intelligent transformation, highlighting real-world applications across industries such as public utilities, finance, transportation, energy, manufacturing, and more. Visitors can explore scenario-based solutions for the commercial market and learn about HUAWEI eKit, designed for small- and medium-sized enterprises.

- **Innovative Digital and Intelligent Infrastructure:** This area will feature Huawei's leading products and portfolios for data communication, all-optical networks, data storage, smart campuses, data centers, and Huawei Cloud. These offerings are designed to empower customers at every stage of their digital and intelligent transformation journeys.

Driving Industry Dialogue and Thought Leadership

Beyond showcasing its latest technologies, Huawei will actively participate in discussions shaping the future of industrial intelligence. The company will host the Industrial Digital and Intelligent Transformation Summit, along with numerous forums, talks, and speeches. These events will bring together thought leaders, industry professionals, technical experts, and partners from around the world to exchange ideas and explore a wide range of topics related to the pan-enterprise market, industry intelligence trends, and best practices.

To gain more insight into Huawei's participation at GITEX Global 2024, Telecom Review sat down with Leo Chen, Corporate Senior Vice President and President of Enterprise Sales at Huawei.

What will Huawei be showcasing at GITEX Global 2024? What highlights can we expect?

GITEX Global provides a unique platform for engaging in meaningful dialogues with industry peers about the trends and perspectives on industrial intelligence. We look forward to sharing our insights, learning from others, and collectively exploring the endless possibilities of industrial digital and intelligent transformation.

At GITEX Global 2024, Huawei will showcase innovative practices in digital and intelligent transformation and engage in meaningful discussions with global customers, partners, and industry leaders. Our booth will offer immersive experiences, highlighting real-world applications of our technologies across various industries.

We will also actively participate in thought leadership forums and summits, sharing our insights and exploring the potential of intelligence to drive progress.

The key highlight is our commitment to showcasing the tangible benefits of digital and intelligent transformation across industries. Visitors can experience firsthand how our technologies are being applied to solve real-world challenges and create new opportunities.

AI has taken center stage in our lives, and it's no surprise that the theme of GITEX Global 2024 is 'AI Everything.' How is the rapid advancement of AI technologies influencing your industry sector? How is Huawei adopting this trend?

From a commercial application standpoint, no other technology has had such a profound impact in such a short amount of time. Overall, ongoing advancements in AI are driving more in-depth intelligent transformation across industries, laying the groundwork for All Intelligence.

AI is rapidly becoming the most impactful technology across industries, driving profound intelligent transformation. At Huawei, we have embraced an "All Intelligence" strategy, leveraging our years of experience in intelligent transformation to help industries worldwide embrace this shift. We envision future intelligent enterprises characterized by six key features: Adaptive User Experience, Auto-Evolving Products, Autonomous Operations, an Augmented Workforce, All-Connected Resources, and an AI-Native Infrastructure.

How does Huawei view the concept of the 'intelligent world'? What innovations, beyond AI, will shape the future of the industry?

The intelligent world is rapidly becoming a reality, with digital and intelligent technologies revolutionizing our lives and work. Huawei's full-stack technical capabilities in network, storage, computing, and cloud uniquely position us to support industries in building AI-ready infrastructure. We are committed to working with global

partners to lay a solid foundation for this intelligent era.

How is Huawei's business adopting and integrating AI innovation?

Over the past six years, we have steadily pressed ahead with strategic AI development, culminating in our All Intelligence Strategy. At Huawei, we are fully committed to integrating AI into our internal operations for enhanced efficiency and user experience. This two-phase approach involves applying AI to repetitive, large-scale tasks for increased efficiency, followed by leveraging AI foundation models to streamline cross-departmental collaboration, information sharing, decision-making, and execution. We are also building large corporate AI models using our Pangu models and high-quality data to reshape the way we work. **TR**

> Beyond showcasing its latest technologies, Huawei will actively participate in discussions shaping the future of industrial intelligence

NOKIA

Kamal Nagpal,
Head of Sales, Middle East & Africa,
Cloud & Network Services (CNS),
Nokia

2024: A Year of Innovation in Nokia's Cloud & Network Services

In an exclusive interview with Telecom Review, Kamal Nagpal, Head of Sales, Middle East & Africa, Cloud & Network Services (CNS) at Nokia, discussed the business group's journey through 2024 in detail, and expanded on the strategic areas it will be pursuing in 2025, among other insights.

We're in the last quarter of 2024. What are some of your key observations from 2024 so far? 2024, for me, has been a year of innovation in the Cloud & Network Services business group at Nokia. AI and the telco cloud have played a big part in our innovation journey. We have infused AI into a variety of our products—cybersecurity, customer experience management and overall network management—which brings a higher level of automation and efficiency to CSPs. And there has been considerable interest and discussions with our customers in the Middle East to incorporate such solutions. That's the first one.

The second one is monetization. Our customers are challenged with newer ways to monetize their networks, particularly 5G, in which they have invested significant CapEx. One of the shifts in the year has revolved around

migrating from a 5G Non-Standalone network to a 5G Standalone Core network, which brings a lot of new features (like network slicing) that enable new use cases... Think cloud gaming enthusiasts that want better latency, which can be provided through network slicing.

To put the growth of 5G SA Core into perspective, at the end of Q2 2024, Nokia had the most 5G Standalone Core operator customers, with a total of 116, and the most live deployments at 34, according to industry data. Furthermore, Nokia was named a Leader in the 2024 Gartner® Magic Quadrant™ for CSP 5G Core Infrastructure Network Solutions. And the reason for being highly rated is because our portfolio offers a fully automated and scalable software model, with near zero-touch automation and ultra-low latency capabilities. In the Middle East, I've had multiple discussions with CSPs to begin this transition, which makes for an exciting 2025 and beyond.

And I'd say the last one is energy efficiency. The importance of sustainability is at the forefront of agendas for countries and companies, particularly for CSPs, given the rising costs of energy and the need to reduce their CO2 emissions. Many of my discussions with customers end with: 'How big will the impact of my carbon footprint be?'. I'm glad that everyone is thinking about our impact on the planet. In fact, our AVA Energy Efficiency portfolio helps our customers reduce their energy consumption by using AI to monitor the different network elements and suggest an alternative path forward.

There are many other moments, but these are the key ones so far!

The Open Innovation Lab in Dubai was opened during Q2 2024. How will Nokia utilize this facility to drive innovation in the region?
One of my favorite reasons for being a part of a global company (Nokia) is our ability to bring learnings from across the globe and apply them to the MEA region. Bringing newer technologies is the first step, but the next one is the

most important. The next step involves adapting these technologies to local requirements and addressing local use cases. One of the initiatives undertaken by Nokia is the Open Innovation Lab.

There are three important areas of the lab that benefit operators and enterprises. The first area aims to drive further innovation in the Cloud RAN space with Nokia's technology partners, such as Dell and HPE, as well as market-leading hyperscalers and other ecosystem players. The second area focuses on private wireless and industrial networks, where the lab will showcase innovative Industry 4.0 use cases and industrial edge applications on Nokia's market-leading MX Industrial Edge (MXIE) platform to help enterprises accelerate their transition to Industry 4.0 in the region. The third area focuses on network intelligence. Nokia aims to accelerate the adoption of artificial intelligence (AI) and machine learning (ML) solutions for network automation and optimization.

Could you compare the overall performance of networks in the region with the top-performing networks across the world? What must countries in the Middle East do to get better?
If you take a look at the latest Ookla reports, which is the go-to for network KPIs, you will find that the top three best performing networks primarily come from the Middle East region. Surprised? I am not! The general performance and availability of networks in the Middle East is quite strong, however, networks are really tested, or taken to the limit, when there are high congregations of people that are densely concentrated in small areas. For example, the Expo in Dubai, FIFA world cup in Qatar or Hajj in Saudi Arabia place a lot of pressure on networks and there needs to be 100% availability. I would even say that our success in the region is being replicated in other parts of the world, which makes me proud to be in this region.

However, there are some areas where more attention and focus is needed. The primary one is cybersecurity. The number of cyberattacks

being witnessed across the world is alarming. Every day, people, enterprises and governments are being targeted. The attacks are also getting more sophisticated. Nokia is working with partners like Microsoft to offer a telco-specific solution—such as the Netguard Cybersecurity Dome—that is infused with AI and automation and is integrated into multiple pre-built 5G security use cases for the core, RAN and transport domains. The platform offers Extended Detection and Response (XDR) capabilities that collect, aggregate, analyze, and correlate security data from a variety of sources, enriching it with telco specificity to help security operations teams assess business risks, improve decision making, and control costs.

> Nokia maintains the strong stance that AI systems should be fair and reliable; it should be environmentally and socially sustainable; and it must protect privacy

And secondly, the Middle East needs to get more bullish on automation. Everyone's talking about it; but there is a sense of reluctance. They first think about its impact on cost structure and then the actual benefits. While there is a cultural connotation to it, the benefits of automation, especially when combined with AI and machine learning, are undeniable.

Additionally, AI should be used ethically and responsibly. Nokia maintains the strong stance that AI systems should be fair and reliable; it should be environmentally and socially sustainable; and it must protect privacy. In fact, Nokia has defined principles to guide all our AI research and development in the future. Keeping these principles in mind, our Digital Operations Centre enables CSPs to manage the entire lifecycle of their services from design to deployment on a large scale.

A lot of your solutions can be deployed in the cloud. Have you seen a lot of demand from the region for your solutions as a service?
Software as a Service, or simply, SaaS, has been a part of the IT world for a while now. The telco world was in catch-up mode, but not anymore. Today, a large number of solutions are being delivered through the SaaS model and our customers are realizing its benefits. These include faster time-to-value, better cost-effectiveness when switching to a subscription service, better agility to scale up or scale down quickly depending on the business requirements, and a more secure environment.

Being based on a fully cloud-native environment, we employ an anyCloud strategy, which means our software can operate on a public cloud of big hyperscalers, or a private cloud built by CSPs, or a hybrid cloud that combines public and private. In fact, Nokia offers analytics, cybersecurity, charging and even 5G Core as a Service to customers, and there has been strong interest across the MEA region and particularly in the Middle East.

The biggest challenge is the regulation and storage of information.

Considering that the data linked to a software that is offered as a service may not be stored in the country where the service is offered, there is great concern regarding data privacy and security. We still have some way to go before SaaS becomes mainstream in the telco world, but I am confident that we will demystify the concerns of policy makers and companies can then take full advantage of SaaS business models.

Where do you forsee the Middle East region heading as we enter 2025? What are some of the key strategic areas that will drive telco growth in the region?
I think the Middle East region is a mix of countries at various maturity levels in their technology journey. There are countries, like the UAE, Saudi Arabia and Qatar, that are far ahead in their 5G journey and there are others that are still investing. Irrespective of the journey, all CSPs are realizing that investing in 5G is not enough; they need to have a clear path to monetization. As many are planning their modernization strategies, they are also thinking about ways to monetize their investments.

Heading into 2025, one of the most promising monetization strategies in the Middle East lies in network APIs (Application Programming Interfaces). These APIs enable application developers to seamlessly integrate advanced 5G network capabilities into their applications. APIs are essentially standardized interfaces that allow developers' applications to communicate with and leverage features within telecom networks. Imagine the possibilities of new digital experiences!

Nokia has developed a platform, called Network as Code (NaC), that is the heart of this system and is the interface between the application developers and CSPs' APIs. We've drawn inspiration from industry efforts—like the GSMA Open Gateway and the Linux Foundation's CAMARA project—to create a two-way ecosystem that simplifies network complexities, providing developer-friendly access to powerful network functionalities, monetizable opportunities to telcos, and fresh product and service possibilities for enterprises.

Let me give a recent example. In Antwerp, our Network as Code platform was used to provide the captains of shipping vessels passing through the narrow channels with high-definition video, particularly on tricky turns, or when loading and unloading cargo—essentially, when it was needed. This situational awareness enabled quicker journey times and better safety.

While there are many more areas where I believe we will see growth in the Middle East, I believe this is going to be the most interesting area that's leading engaging discussions with customers. **TR**

> Heading into 2025, one of the most promising monetization strategies in the Middle East lies in network APIs

Red Hat at GITEX 2024: Driving the Future of Open Innovation

Red Hat is once again set to play a central role in driving discussions on open-source technologies, cloud innovation and digital transformation at GITEX Global 2024, one of the world's most influential technology events. As an industry leader in enterprise open-source solutions, Red Hat's participation at GITEX 2024 underscores its commitment to empowering organizations through open collaboration, scalability and innovation.

Showcase of Innovation
At this year's GITEX, Red Hat will showcase its expansive portfolio, spotlighting the ways in which open-source solutions can transform business operations and help enterprises adapt to the fast-evolving technological landscape. Red Hat's solutions are designed to meet the needs of the most demanding IT environments of the current world, from leveraging the hybrid cloud, to optimizing workloads, to enhancing security with automation, to harnessing artificial intelligence (AI) and machine learning (ML).

In line with its participation, Red Hat will offer live demonstrations, deep dives into product offerings and the chance to interact with its experts to explore customized solutions that drive operational efficiency, agility, and innovation.

Expanding the Open Hybrid Cloud Vision
Central to Red Hat's participation will be its open hybrid cloud strategy, which continues to reshape the future of IT. Built on Red Hat Enterprise Linux (RHEL) and powered by technologies such as OpenShift, Red Hat's hybrid cloud platform enables businesses to seamlessly integrate their on-premises infrastructure with public cloud environments, ensuring consistency, scalability and enhanced security.

During GITEX, Red Hat will also explore the ways in which the hybrid cloud enables businesses to future-proof their operations, reduce costs and ensure they remain competitive in an increasingly digital-first world. Visitors can learn about the potential of Red Hat's solutions in empowering businesses across industries—including the finance, healthcare and telecommunications industries—to embrace their respective cloud journeys with confidence and control.

Driving Automation and Security
As businesses move to the cloud and digitalize their operations, automation and security have become key concerns. In line with this, Red Hat will highlight its open-source automation tools, such as the Ansible Automation Platform,

which plays a substantial role in helping organizations automate repetitive tasks, streamline workflows and improve operational efficiency.

In addition, Red Hat will exhibit its commitment to ensuring that security remains a priority in every layer of an organization's IT infrastructure. With solutions that integrate security as part of the development process (DevSecOps), Red Hat helps enterprises safeguard their digital assets while enabling the faster delivery of applications and services.

The Power of Collaboration
Red Hat's open-source philosophy is not just about technology; it is about building ecosystems of collaboration. At GITEX, Red Hat will shed light on its partnerships with both customers and industry leaders and its role in driving co-creation and innovation. From contributing to upstream open-source projects to working hand-in-hand with partners in various sectors, Red Hat's collaborative approach is redefining the way technology is developed and deployed.

This year's event will include a range of sessions and will feature panel discussions bolstered by the active participation of Red Hat executives and partners. During the sessions, they will share their expertise on the latest technological trends, customer success stories, and the future of IT infrastructure. These engagements are designed to inspire businesses to adopt open-source strategies that fuel long-term innovation.

Empowering the Middle East's Digital Transformation
The Middle East continues to be a pivotal region for digital transformation and Red Hat is dedicated to helping organizations in this region embrace the future of technology. As governments and enterprises in the Middle East ramp up their digitalization efforts, Red Hat's open-source solutions offer a path to modernization that fosters economic growth, operational excellence and security.

During the event, Red Hat will be highlighting the pivotal role its solutions play in helping industries in the Middle East build the digital infrastructures they need to thrive—a testament to its

unwavering commitment in developing the region. With the rise of initiatives such as smart cities, digital governance, and a cloud-first approach, Red Hat is well positioned as a key partner in the region's journey towards technological advancement.

Join Red Hat at GITEX 2024
As one of the most highly anticipated technology events of the year, GITEX 2024 promises to be a platform for groundbreaking discussions, networking, and innovation. Red Hat's presence at the event reaffirms its role as a leader in enterprise open-source solutions. Red Hat remains committed to driving technological advancements and helping businesses embrace a future powered by open innovation.

Whether you are a CIO, developer, or IT architect looking to accelerate your cloud journey, automate critical processes or build more secure and scalable IT infrastructures, visit Red Hat's booth at GITEX 2024 to explore how open-source technology can transform your business. **TR**

By Adrian Pickering, Regional General Manager, Red Hat

> Visit Red Hat's booth at GITEX 2024 to explore how open-source technology can transform your business

In the age of digital transformation, cloud services are helping global organizations modernize their applications, migrate their workload to the cloud and innovate with data, analytics and artificial intelligence (AI). Consequently, data center development has become vital for processing high-quality data to enhance operational efficiencies.

xFusion's Innovative Liquid Cooling Solution Redefines Data Center Operations

However, in this data-center-operations growth story, a stark reality prevails. According to a new International Data Corporation (IDC) report, AI data center energy consumption is forecast to grow at a CAGR of 44.7%, reaching 146.2 Terawatt hours (TWh) by 2027, with AI workloads consuming a growing portion of total data center electricity usage. The IDC expects global data center electricity consumption to more than double between 2023 and 2028, demonstrating a five-year CAGR of 19.5% and reaching 857 Terawatt hours (TWh) in 2028. Moreover, climate conscious investors and regulators are keen to ensure that such spikes in power do not trigger a huge rise in greenhouse gas (GHG) emissions.

Turning to Liquid Cooling
There is an urgent need to find solutions that can increase data center efficiency in both a sustainable and cost-effective way. Given that data centers operate 24/7, consuming

vast amounts of electricity to power the servers and process data, a lot of heat is generated. If this heat is not removed, the electrical components can overheat and fail.

This evolving trend poses newer challenges for the telecommunications industry as fragmented construction of intelligent computing services can drive up costs. For instance, a single 8-card GPU server consumes nearly 10 kW, resulting in extremely low rack space utilization, making air cooling increasingly unfeasible. To combat these effects, experts suggest introducing technological solutions such as improving chip efficiency and introducing liquid cooling solutions, as well as rethinking data center design to increase data center efficiency.

Liquid cooling has become the necessary (and preferred) choice for managing data center temperatures. Building large-scale, low-cost, liquid-cooled intelligent computing centers can optimize computing power and ensure energy-efficient computing networks, significantly reducing costs and improving efficiency.

xFusion's Solution for Telecommunications
xFusion's flagship product, the FusionPoD for AI—a rack-scaled, liquid-cooling server—has become the ideal choice for experts and practitioners in the telecommunications industry engaged in AI research and application development. China Telecom's Hangzhou Intelligent Computing Center is a prime example of FusionPoD's successful deployment.

xFusion provides an end-to-end complete liquid cooling solution for data centers, featuring a comprehensive secondary side integration delivery scheme. The FusionPoD for AI server can be used for large-scale deployment, significantly enhancing delivery efficiency.

Leveraging a native liquid cooling design, it incorporates measures such as splash protection, liquid leakage

diversion, and shut-off to ensure the reliable operation of high-value equipment, adding an extra layer of protection. This further helps clients save electricity, achieving exceptional energy efficiency and ultra-low PUE.

Through collaborative innovation, the FusionPoD has been thoroughly validated and operates stably in intelligent computing centers.

International Recognitions
In addition, FusionPoD for AI server has received international acclaim for its innovative features, including prestigious certifications and awards. Critically, its liquid cooling system has earned TÜV Rheinland certification for its leak-proof design, addressing a key concern in liquid cooling technology. Furthermore, FusionPoD boasts the TÜV SÜD Certification for its exceptional power usage effectiveness (pPUE) of 1.06 – the lowest in its class – and its intelligent data center (DC) server capabilities. Its industry-leading design and efficiency were further recognized with the 2023 Interop Tokyo Best of Show Award Grand Prize and the IDA Design Award Gold Winner 2023. The FusionPoD servers have been deployed in over 70,000 nodes globally.

Future Innovations
On September 24, Intel unveiled its groundbreaking Intel Xeon 6 processors with Performance-cores (P-cores), revolutionizing the high-performance computing (HPC) landscape. As a key strategic partner, xFusion announced its full support of these new processors, which form part of its FusionServer lineup.

This collaboration between xFusion and Intel has set the stage for advanced HPC and energy-efficient solutions. Powered by the Intel Xeon 6 processors with P-cores, the next-generation FusionServer offerings will introduce transformative upgrades across the following niches: AI, HPC, liquid cooling, and general-purpose computing products.

The FusionPoD servers are known its efficiency during peak performance,

exceptional energy efficiency and ease of maintenance ideal for data-center performance and the development of green data centers.

In Conclusion
The growing global digital economy is expected to drive a substantial increase in demand for data centers, making them a key area for investment and expansion. However, to ensure cost-effective and sustainable growth, there will be a strong focus on energy-efficient solutions. Innovations like xFusion's FusionPoD for AI servers will play a crucial role by enabling the integration of high-performance computing power with energy-efficient networks, helping to reduce both operational costs and environmental impact. **TR**

Ramakrishna P., CEO, India Mobile Congress (IMC)

India Mobile Congress: Shaping the Future of Technology

In an exclusive interview with Telecom Review, Ramakrishna P., CEO, India Mobile Congress (IMC), gave an overview of the IMC's evolution to becoming Asia's largest technology expo and discussed its role as a key player in global digital transformation.

With the 8th edition of India Mobile Congress approaching, could you elaborate on the evolution and milestones of this event over the years?

Over the past decade, India has witnessed massive growth due to the data revolution, which has been driven by the rapid expansion of 4G networks, and now, 5G, affordable smartphones, and low-cost data plans. This digital surge has transformed the country into one of world's largest data consumers, fueling innovations in the industry. Aligning with this transformation, the journey of the India Mobile Congress (IMC) over its previous seven editions has been a remarkable evolution as well, solidifying its position as Asia's largest technology expo and a key player in global digital transformation.

Since its inception, IMC has consistently seen a growing participation from global leaders, startups, and industry experts. Each year, the event has expanded its scope, and the last edition of IMC in 2023 witnessed over 1.5 lac attendees, CXO-level delegates and speakers, 600+ exhibitors, and participation from over 67 countries. IMC 2024, held from 15-18 October in New Delhi, India, will continue on this trajectory, serving as a vibrant platform where India leads the charge in shaping the future of technology, underscoring its role as a global digital powerhouse.

What are the key highlights of this year's India Mobile Congress, and how do they reflect the advancements and trends shaping both the Indian and global technology industries?

IMC 2024 will spotlight over 1,100 exhibitors and participation from 120+ countries, featuring various discussions and showcases on AI, 6G, semiconductors, cleantech, quantum, SATCOM, electronics manufacturing, IoT, broadcasting and other emerging areas in the tech and telecom sector. The event also aims to showcase more than 900 technology use-case scenarios and host 100+ sessions and talks by more than 600 global speakers.

Through the second edition of 'Aspire'—a pioneering startup program—we aim to enable more than 500 one-on-one meetings and interactions for startups with more than 1,000 potential investors, angels, incubators and VC funds. With participation from various countries, IMC 2024 underscores India's commitment to global technology leadership and collaboration. The forum will serve as a live demonstration of India's technological prowess and its pivotal role in becoming a global leader in these domains.

India has recently seen significant reforms in the technology and telecom sectors, driven by government initiatives. How do you perceive the industry's response to these changes, and how does the IMC serve as a platform to showcase and support this evolving landscape?

There have been various initiatives from the Indian government on the fronts of AI, 5G, and quantum, which have really enabled the industry to innovate, invest in R&D, and witness transformative progress in the last few years. In line with these developments, the IMC 2024 is going to put a major focus on AI- and GenAI-based discussions, and will showcase and delve into themes like 'AI in networks', 'AI in Chipsets', and 'Ethical AI'. The Aspire program will also witness over 140 startups focusing on AI-based applications in different industries.

The IMC is happening alongside the World Telecommunication Standardization Assembly (WTSA) this year. How do you think the platform will shape thought leadership and aid in the evolution of future technologies?

The India Mobile Congress (IMC) 2024 is happening concurrently with the World Telecommunication Standardization Assembly (WTSA) 2024, which presents a unique opportunity for India that is poised to significantly shape thought leadership and drive the evolution of future technologies. India is set to host the WTSA-24 from October 15-24, which occurs every four years to "define the work program, working methods, and structure of study groups" for the ITU's Telecommunication Standardization Sector (ITU-T). The WTSA-24 forum is expected to witness over 1,800 delegates from 193 member countries, global standardization bodies, and the telecom/ICT industry.

By bringing together a diverse group of technology leaders, policymakers, innovators, and industry experts, IMC 2024 will also add immense value to thought leadership, global standards, and foster a collaborative environment where new ideas can be explored and transformed into real-world applications.

The Middle East and India maintain strong trade ties. Will there be participation from the Middle East this year? Are there any special highlights?

As IMC is happening parallel to WTSA-24, we are anticipating participation from 120+ countries, including the Middle Eastern nations. We will have telecom ministers, regulators, policymakers, and other key stakeholders coming together to discuss advancements in areas like artificial intelligence (AI), SATCOM, broadcasting, etc., through various significant programs like AI for Good, the Global Summit 2024 and the Global Regulators' Conference. Moreover, we have received keen interest from Middle Eastern countries, which wish to collaborate with Indian startups that are leveraging 5G technology in the field of agritech. **TR**

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> IMC 2024 is happening concurrently with the World Telecommunication Standardization Assembly (WTSA) 2024, which presents a unique opportunity for India
> "

UAE Ranks First in the UN-DESA's Telecommunication Infrastructure Index

In the recently released E-Government Survey from the United Nations Department of Economic and Social Affairs (UN-DESA), the United Arab Emirates (UAE) ranked first globally in the Telecommunication Infrastructure Index (TII), scoring 100%.

The report also included the Human Capital Index (HCI), which increased the UAE's rank from 44th to 10th, reflecting the UAE government's concerted efforts in skills development to accelerate digital transformation. This feat positions the country as the first in Asia and the Arab world in the HCI.

In the E-Government Development Index (EGDI), the UAE scored 95%, solidifying its position as one of the world's most developed countries.

Additionally, the UAE became the first country to achieve a perfect score in both the content provisioning and institutional framework standards, as well as the E-Government Literacy (EGL) index—two sub-indices of the Online Service Index (OSI).

We the UAE 2031

Telecommunications and Digital Government Regulatory Authority's (TDRA) Chairman, Talal Humaid Belhoul Al Falasi, celebrated the efforts of the minds behind the UAE's milestones, highlighting how the UAE is now reaping the rewards of solidifying the foundations of a digital knowledge society and economy and leveraging cutting-edge technologies such as artificial intelligence (AI).

"The UAE's progress in digital government is an outstanding model in integrating human creativity with technology to facilitate people's lives. The UAE government has been proactive in investing in the telecommunications sector as part of a forward-looking vision in line with the directives of the wise leadership. For over more than two decades, major investments have been made in telecommunications infrastructure. This, accompanied by the upskilling of government cadres has reflected on our country's progress in this vital sector, which represents the basis of sustainability and creating the future," he stated.

Furthermore, TDRA's Director General, Eng. Majed Sultan Al Mesmar, underscored the TII as one of the most important pillars in global competitiveness and sustainable development initiatives, reflecting the level of progress by countries in adopting modern technologies.

He stressed the significance of the UAE's journey in achieving a digital economy and smart city based on an inclusive government, customer centricity, business continuity, and proactivity.

Oman Launches National AI and Advanced Digital Technologies Program

His Excellency Said bin Hamoud Al Maawali, Minister of Transport, Communications, and Information Technology (MTCIT), announced the official launch of Oman's National Program for Artificial Intelligence (AI) and Advanced Digital Technologies, highlighting information and communications technology (ICT) as one of the strategic foundations driving the economy.

Under the framework of Oman Vision 2040, the initiative will extend from 2024 until 2026. This initiative serves as an upgrade to the Executive Program for Artificial Intelligence and Advanced Technologies launched in 2022.

Emphasizing the importance of implementing and localizing AI technologies, His Excellency and the MTCIT remain steadfast in building a digital economy that promotes sustainable development by establishing a national program.

National Program Pillars

The MTCIT's program aims to harness the transformative potential of AI to drive the country's economic and developmental sectors. The program aligns with Oman's ambition to rank among the top 50 countries in the Government AI Readiness Index.

The program includes the following pillars:

- **Enhancing and Adopting AI in Economic and Developmental Sectors:** This supports the application of AI across various sectors, enhancing quality and operational efficiency.
- **Localizing AI Technologies:** Through the promotion of public-private partnerships, the program aims to cultivate local capabilities and talents, strengthen technical infrastructures, and support cutting-edge, AI-driven research and developments.
- **AI Applications Governance with a Human-Centered Vision:** This pillar is central to creating legislative and regulatory frameworks, ensuring the safe use of AI technologies, and protecting data.

Kuwait Telecom Companies Gear Up for 5G Services Roll Out

Kuwait's Communication and Information Technology Regulatory Authority (CITRA) has revealed that telecommunication companies are preparing to launch the latest generation of network technology— 5G—in the country by the end of 2024.

Within the next three months, telecommunication companies in Kuwait will be launching the 5G service on the same date following completion of the preparations and approval from the CITRA.

Mobile telecom operators can obtain a license to operate 5G services for a fee of USD 1 million (approximately KWD 305,410), payable within six months after issuance.

New 5G Frequencies
In preparation, mobile operators have been allocated the 2600 MHz and 2300 MHz bands for the 5G frequency channels.

Given that the allocation leverages a dual access system with time division, telecom operators must comply with the terms, conditions, and obligations in addition to the settled annual licensing fees of the frequency channels.

CITRA's decision comes after phasing out 3G services by 2025 and introducing new frequencies prior to the rollout of 5G-Advanced in the country, accelerating Kuwait's global position in adopting the latest innovations.

The strategic move was initiated in line with Kuwait's Vision 2035 to enhance the country's user experiences and digital services across various sectors.

From Role Models to Evolving Players: Assessing Arab States in the ITU's GCI 2024

Countries around the globe are improving cybersecurity efforts, but stronger actions are needed to meet evolving cyberthreats, according to ITU's Global Cybersecurity Index 2024. On average, countries have taken more cybersecurity-related actions and improved their cybersecurity commitments since the last index released in 2021.

"Building trust in the digital world is paramount," said Doreen Bogdan-Martin, ITU Secretary-General. "The progress seen in the Global Cybersecurity Index is a sign that we must continue to focus efforts to ensure that everyone, everywhere, can safely and securely manage cyberthreats in today's increasingly complex digital landscape."

Arab States' Assessment
The ITU's Global Cybersecurity Index 2024 (GCI 2024) assesses national efforts across five pillars, representing country-level cybersecurity commitments:

legal, technical, organizational, capacity development, and cooperation.

The GCI 2024 also refers to a new five-tier analysis, a shift that allows a greater focus on each country's advances in its individual cybersecurity commitments and consequential impacts.

Tier 1, the highest of the five tiers, is reserved for "role modelling" countries which demonstrate a strong commitment to all five cybersecurity pillars. This is followed by "advancing" (Tier 2), "establishing" (Tier 3), "evolving" (Tier 4), and "building" (Tier 5) countries.

Out of the 46 countries in Tier 1, 8 countries from the Arab States were included. Egypt, Qatar, Saudi Arabia, and the United Arab Emirates excelled in all pillars.

Among the Tier 3 countries are Algeria, Kuwait, Libya, and Tunisia, all of which boast varying scores in legal, cooperation, technical and capacity development measures.

The majority of the Arab States fall within the Tier 4 segment, exhibiting largely expanded digital services and connectivity, and demonstrating a need to integrate

cybersecurity measures. These include Comoros, Djibouti, Mauritania, Palestine, Syria, Iraq, Lebanon, Somalia, and Sudan.

Yemen's score highlights that it needs to work on all five cybersecurity pillars, together with Afghanistan, Korea, the Maldives, Micronesia, and the Vatican, among others.

Key Cybersecurity Findings
Amidst the progress, a "cybercapacity gap"—characterized by limitations in skills, staffing, equipment and funding—was evident in many countries and across all regional groups.

"The Global Cybersecurity Index 2024 shows significant improvements by countries that are implementing essential legal measures, plans, capacity-building initiatives, and cooperation frameworks, especially in strengthening incident response capabilities," said Cosmas Luckyson Zavazava, Director of ITU's Telecommunication Development Bureau.

Legal measures emerged as the strongest cybersecurity pillar, with 177 countries having at least one regulation on either personal data protection, privacy protection, or breach notification in place or in progress.

Investors Flock to Data Centers: GCC Emerging as Global Leader

In 2023, data centers saw the second-largest investment year in the past decade globally. According to a report by global law firm, Linklaters, investment in data centers reached USD 36 billion in the past year, with USD 22 billion invested in the first five months of 2024.

Data centers are typically owned and operated either by large companies, such as cloud vendors, banks, or telecommunications firms, for their own purposes, or by co-location companies. Investors are drawn to data centers due to their steady, utility-like cash flows and attractive risk-adjusted yields.

The GCC data center market alone is expected to reach over USD 7 billion in investments by 2029.

The Middle East Landscape
The Middle East is witnessing substantial growth in the data center sector, driven by increased internet access and digital adoption. According to Turner and Townsend, the region currently boasts USD 1.2 billion in active data center projects and a future pipeline of USD 433 million, making it one of the fastest-growing industries.

The GCC data center market is emerging as a global leader, with significant investments from both existing operators and new entrants. In 2023, the GCC accounted for over 30% of the total data center investments in the Middle East. The rise of advanced technologies like AI, 5G, and digitalization, along with expanding undersea cable connectivity and government initiatives, are driving market expansion.

The presence of global cloud providers such as AWS, Oracle, and Google Cloud further boosts data center investments. The UAE, with its robust fiber connectivity and high internet usage, is a significant hub, led by Dubai and Abu Dhabi.

The UAE also has the largest concentration of data centers in the Middle East and is now more open to foreign direct investment and M&A activity. An example of this was witnessed in early 2024 when the UAE and Kazakhstan signed an agreement to explore investment opportunities in data centers and artificial intelligence (AI).

From a telco perspective, du and e& Carrier & Wholesale are expanding their state-of-the-art facilities, thus, enhancing regional digital infrastructure. UAE-based Khazna also announced its plan to enter the Egypt market with Benya Group in May 2023 by building a USD 250 million state-of-the-art data center set to be Egypt's first hyperscale data center.

In Saudi Arabia, stc's center3 is among the largest operators, with plans for significant data center development by 2025-2026. The country's strict data protection laws and smart city initiatives are further fueling demand. International players like Infobip are also entering the market, contributing to local economic growth and job creation.

Initiatives like New Kuwait 2035 and Digital Oman 2030 are contributing to data center growth across the MENA region. Iraq has also made strides with the inauguration of its National Data Center, and Jordan's Aqaba Digital Hub is expanding its capacity, improving data exchange efficiency.

Why is the Data Center Market Attractive to Investors?
As the demand for advanced data processing and storage solutions continues to grow, several key advancements in the data center market are poised to attract significant investor interest. These advancements cater to the evolving needs of modern businesses and technologies, making data centers a lucrative investment opportunity.

Edge Computing: Investors are interested in data centers that can support edge computing infrastructures because they reduce latency by processing data closer to the source, enhancing real-time data handling. This capability is critical for emerging technologies like IoT and autonomous vehicles, offering faster response times and improving overall performance, which can drive higher demand and revenue growth.

In line with this, Rosenberger has introduced Lyra, an intelligent micro data center solution for edge computing environments. Lyra

consolidates essential infrastructure components like power distribution, cooling, UPS, backup systems, cabling, and environmental monitoring into a standardized cabinet.

AI and Machine Learning (ML) Integration: Investors are interested in data centers that integrate AI and machine learning because these technologies enhance operational efficiency, improve predictive maintenance, and optimize resource utilization. This leads to cost savings, increased reliability, and the ability to offer advanced analytics services, making the data centers more competitive and profitable.

Data center network technologies empower telcos to provide flexible and scalable services, harness the potential of edge computing and embrace AI and ML for network optimization, among other functions.

Renewable Energy Integration: Investors are interested in data centers powered by renewable energy because they reduce operational costs, meet growing regulatory and environmental standards, and appeal to socially conscious customers. This sustainability focus not only lowers energy expenses but also enhances the data center's marketability and long-term viability, driving higher returns on investment (ROI).

Sustainable financing mobilizes capital for environmentally-beneficial projects—such as reducing greenhouse gas (GHG) emissions and promoting renewable energy—by facilitating partnerships with capital providers, innovators in data center infrastructure, and developers of solar and wind farms. This approach helps data center operators and investors align with global climate goals, fostering innovation, competitiveness, safety, and growth in the industry.

Investors' interest in data centers powered by renewable energy is reflected in several recent initiatives. Huawei and DEWA pioneered the largest solar-powered data center in the MEA region, while Moro Hub and Huawei are collaborating on a

similar project. Additionally, MIS and Abunayyan Holding Group have signed an MoU to develop green data centers in Saudi Arabia.

Hybrid and Multi-Cloud Environments: Investors are interested in data centers that support hybrid and multi-cloud environments because they offer flexibility, scalability, and resilience. Businesses can optimize their IT infrastructure by seamlessly integrating private and public clouds, reducing dependency on a single provider, and ensuring better performance and cost-efficiency. This adaptability meets the diverse needs of modern enterprises, making such data centers highly attractive for investment.

For example, in May 2024, one of the most prominent national banks in the UAE selected HPE GreenLake, hosted in du's hyper-connected and Tier III Certified data centers, to accelerate CBD's hybrid cloud journey.

Security and Compliance: Investors are interested in data centers that prioritize robust cybersecurity measures and compliance with data protection regulations because they ensure the protection of sensitive data, minimize the risk of breaches, and avoid costly legal penalties. This focus on security and compliance builds trust with clients and enhances the data center's reputation, leading to increased demand and a more stable investment.

Cisco's plan to establish an edge datacenter for cloud security in Saudi Arabia (KSA) aligns perfectly with the growing investor interest in data centers that prioritize robust cybersecurity measures and compliance with data protection regulations.

Infrastructure-Ready: Investors are interested in data centers prepared for the increased data processing demands of networks driven by faster data speeds, lower latency, and support for a massive number of connected devices. Data centers capable of handling these demands are positioned to benefit from the expected surge in data traffic and futuristic applications, leading to higher revenue potential and growth opportunities.

Rosenberger's data center cabling solution leverages patented, unique PreCONNECT® Trunk connection technology, equipped with various MPO/MTP-LC, MPO/MTP-MPO/MTP modules and patch cords. This allows stakeholders to upgrade smoothly to 40G/100G/400G/800G systems.

Data Center Transformation in the AI Era

As AI continues to evolve and integrate into various sectors, the demand for data centers equipped to handle AI workloads is expected to surge. To meet this growing demand and attract investors, data centers must undergo significant transformations.

Data centers need to enhance their computational power. By incorporating high-performance computing (HPC) capabilities, including GPUs and specialized AI accelerators, they can efficiently process the complex algorithms that AI applications require. This increased computational power must be complemented by expanded storage solutions to accommodate the massive volumes of data generated and processed by AI.

The Dell'Oro Group highlighted that AI networks will drive the transition to higher speeds, with Ethernet remaining the foundation of most enterprise data center networks. Significant investments are being made in Ethernet as it rapidly evolves. By 2025, 800 Gbps is expected to dominate AI back-end network ports, just two years after its latest product introduction.

Improving network infrastructure is another crucial step. Upgrading to support high-speed data transfer and low-latency connections is essential for real-time AI processing. Scalability is equally important, as data centers must implement architectures that allow for the seamless expansion of resources to keep pace with growing AI demands.

Rosenberger's MTP® connector interface, particularly the MTP® Pro connector, plays a pivotal role in supporting the rapid evolution of data centers, enabling them to harness the full potential of AI technology.

Energy efficiency is a significant concern given the substantial power requirements of AI workloads. Data centers can optimize energy consumption by adopting advanced cooling technologies and integrating renewable energy sources. Additionally, robust security measures are imperative to protect the sensitive data involved in AI applications. Strengthening cybersecurity and ensuring compliance with data protection regulations can mitigate risks and build trust with clients and stakeholders.

Furthermore, data centers can leverage AI-driven management for predictive maintenance, resource optimization, and enhanced operational efficiency. Utilizing AI within the data center itself showcases a commitment to cutting-edge technology and operational excellence, further attracting investors. **TR**

The Middle East is witnessing substantial growth in the data center sector, driven by increased internet access and digital adoption

The Strategic Blueprints Governing Telcos' Successful Transition to Techcos

Achieving a successful telco to techco transformation is a complex and multifaceted process that requires a holistic and strategic approach. It involves not only technological upgrades but also significant changes in culture, operations, and customer engagement strategies.

Delivering digital, personalized experiences on-demand is now a top priority for telcos turned techcos. CSPs must surpass the standards set by digital natives and manage vast amounts of data across business, technology, processes, and product performance.

Case Studies and Universal Blueprints
S&P Global Ratings predicts double-digit growth for tech companies as they explore new avenues for expansion and diversification. This trend highlights the evolution of UAE telecom operators into prominent tech sector players.

S&P noted that e&'s goal—to generate 40% of its revenues through tech-related businesses by 2030—is attainable through a blend of organic growth and external expansion.

As a pioneer of the telco-to-techco phenomenon, e&'s transformation into a global technology group represents the entity's ambition, innovation and commitment to growth. When asked about what inspired e&'s transition from a telco to a techco, Group CEO, Hatem Dowidar said, "I think the key reason for our transformation and transition is a search for customer intimacy and shareholder returns."

As part of e&'s transformation, the company has established five distinct business verticals: etisalat by e&, e& international, e& enterprise, e& life, and e& capital. This strategic approach allows them to manage each vertical effectively, enhance agility, and maximize value creation.

etisalat by e& CEO, Masood M. Sharif Mahmood, told Telecom Review that this enables e& to "attract strategic partners and investors who align with the specific objectives of each vertical, resulting in a more significant impact." The company has adopted a growth mindset and developed a future-ready business model to fulfill promises, add value for shareholders, seize opportunities and accelerate growth.

On the other hand, du's historic financial performance in 2023 has demonstrated its unwavering commitment to digital transformation and accelerated growth. In line with its commitment to customer experience, network expansion, and continuous innovation, "du is dedicated to meeting the evolving market demands and needs of our [its] valued customers," stated CEO, Fahad Al Hassawi.

As a result, the company has not only maintained its AAA- rating but has also risen to become the third-strongest brand in the UAE and seventh-strongest in the Middle East. This significant growth has propelled du into the Global Top 25 Telecom brands, driven by du's proactive approach to integrating cutting-edge technologies and customer-centric services.

Following its successful merger with Hutchison 3 Indonesia, Indosat has become one of the top global telcos, emerging as Indonesia's second-largest mobile network operator. Indosat President and CEO, Vikram Sinha, proudly explained their strategic transition from a telco to a techco.

He stated, "During the merger, Indosat focused on transforming rather than integrating, aiming to empower Indonesia and pivot towards becoming an AI-native techco. By leveraging scale and investing in technology and human capital, Indosat aims to deliver a superior customer experience and build trust in its brand."

As part of its telco-to-techco transformation, Omantel has formed high-profile international partnerships in the sectors of AI, cloudification, and digital transformation, including collaborations with Huawei and AWS. Their ambitious diversification strategy, leveraging Oman's unique location, has positioned Omantel as an industry leader and a key wholesale provider to telecom operators, hyperscalers, and content providers locally and globally.

Vodafone Oman COO, Aneth Guerra, also shared the telco's vision, which encompasses being rooted in "creating a connected tech-telco ecosystem that equips businesses to excel in today's dynamic digital environment."

Vodafone Oman is also at the forefront of transforming Oman's business landscape with its digital-native foundation and NEXT-LEVEL solutions which support not only Oman's economic diversification goals but also enhances technological advancements crucial for sustained growth.

Bassam Al Ibrahim, CEO, Ooredoo Oman previously mentioned to Telecom Review that "ICT will be a main driver for businesses." Hence, moving from a telco to a techco will be "more disruptive," as the company transitions from offering basic services to the next level through consistent investments, collaborative partnerships with businesses, and the continuous development of advanced technologies.

Telecom Egypt is now focusing its efforts on transitioning from a telco into a techco, following its transformation into an integrated telecom operator and the first digital operator in Egypt. Sharing Telecom Egypt's outlook for 2024, CEO, Mohamed Nasr Eldin, stated "we have many opportunities to pursue and will continue executing our strategy, focusing on our core strengths to better serve our customers, and increase shareholders' value."

> A vital aspect of the telco-to-techco transformation is applying AI to optimize network traffic, manage data patterns, reduce latency, enhance user experience, and save energy

As a trusted CSP partner, Netcracker noted that the journey from a telco to a techco will bring about advantages but telcos need to blueprint strategic plans and solutions to seize opportunities similar to those exhibited by tech companies (techcos). These opportunities include the possibility to innovate more easily; simplify, streamline and increase automation; and collaborate at scale much more effectively.

The Netcracker Digital Platform (NDP) provides the right technology foundation to help CSPs take the next step in digital transformation to become techcos and redefine themselves for what's ahead.

Similarly, TIMWETECH works with telecom operators across the region and the world to offer a digital platform that takes telecom operators to the next level of digitization in their environment as well as their customer experience paradigm.

A Key Modern Component: AI
The biggest challenge in becoming an AI-driven techco is overcoming the conservative "telco trap mindset," which requires extensive validation and incremental improvements, stifling rapid experimentation and deployment.

In response to this, as telcos evolve into techcos, AIOps has become essential for E2E service management. Applying automation and AI to service operations can significantly benefit telecom providers by enhancing assurance, proactively communicating with customers, and improving performance with GenAI.

e& international CEO, Mikhail Gerchuk, pointed out during a Telecom Review Leaders' Summit fireside chat that as an evolving global techco, e& has implemented the most sophisticated AI tools to analyze data in order to provide the most suitable recommendations at any given time, aiming to optimize customer experience. "As a result of this, we were able to improve our upsell numbers three-fold," he explained.

In an emerging trend, telcos are developing small language models (SLMs) tailored for various verticals to drive business. Their scale and trusted security gives them a reliability advantage over startups, positioning them as leaders in AI-driven services.

As a techco company, Omantel is harnessing the benefits that AI and other 4IR technologies are offering to different domains as they work to enable the digital transformation in the Sultanate of Oman.

Realize is dedicated to nurturing its client's digital transformation journey, known as the shift from a telco to a techco. The company's core competencies include AI/ML-based operational automation which consists of autonomous network monitoring with anomaly detection, root cause determination and streamlined remediation.

According to Dr. Lidia Stępińska-Ustasiak, Public Affairs Advisor, Polish Chamber of Commerce for Electronics and Telecommunications, the most important driving force behind the growth of the telecommunications sector will be the transition from telcos to techcos. "Telecoms will be more focused on responsible and effective applications of AI on innovations, new business models, agility, and new investment models."

A vital aspect of the telco-to-techco transformation is applying AI to optimize network traffic, manage data patterns, reduce latency, enhance user experience, and save energy.

The Future of Telco-to-Techco Transformations
The combination of market pressures, technological advancements, strategic initiatives, and evolving customer expectations will likely drive more successful telco-to-techco transformations in the future.

As traditional telecom markets become saturated, telcos are motivated to diversify their services and revenue streams. Transitioning to techcos allows them to tap into new markets and offer innovative services like IoT, cloud computing, and AI.

Many telcos are significantly investing in digital transformation initiatives. This includes modernizing their infrastructure, adopting new technologies, and retraining their workforce to support new tech-driven services.

Telcos are also increasingly forming strategic partnerships and acquiring tech companies to enhance their technological capabilities and service offerings. These collaborations can accelerate their transformation into techcos.

More importantly, customers are increasingly expecting integrated digital services and seamless connectivity. Telcos that can meet these expectations by offering innovative tech solutions will likely see greater success. **TR**

> "The combination of market pressures, technological advancements, strategic initiatives, and evolving customer expectations will likely drive more successful telco-to-techco transformations in the future"

Designing Child-Safe AI: Balancing Innovation and Digital Safety

Children make up one-third of internet users worldwide, clearly implying that this generation will be the first to grow up with digital devices having a constant presence in their lives. With this in mind, national AI strategies and the deployment of AI systems should be designed to accommodate the needs and potentials of children.

UNICEF highlighted the urgent need to study the impacts of generative AI on children. In November 2021, UNICEF's Policy Guidance on AI for Children was published, citing requirements that governments, policymakers and businesses must meet in developing, implementing or using child-centered AI.

In the long run, AI systems must be equitable and inclusive, catering to children from all backgrounds, especially marginalized communities. To support children's development and well-being, AI initiatives must also protect data and privacy, and ensure safety. They should provide transparency, explainability, and accountability; empower stakeholders

with AI knowledge; prepare children for future AI advancements; and create an enabling environment.

Sooner rather than later, children will be highly exposed to AI systems, and if children's data is used, it must be collected and processed responsibly, with clear purposes and safety measures.

Without a doubt, the way AI is shaped today will impact future generations. As noted by UN Secretary General, António Guterres, "present generations have a responsibility to 'halt and prevent developments that could threaten the survival of future generations … [including] new technologies.'"

Ensuring AI Safety for Children

Innovating responsibly also involves creating AI technology that is not only advanced but also safe for everyone, including children. This could be done by implementing strict guidelines and continuously updating protocols to prevent incidents from occurring.

In July 2024, research conducted by a University of Cambridge academic, Dr Nomisha Kurian, identified a significant "empathy gap" in AI chatbots, putting young users or children at risk. Recent incidents showcase the need for emotive AI. For example, in response to a query, Amazon's Alexa instructed a 10-year-old to put a coin inside an electrical plug. Moreover, Snapchat's My AI gave tips to a 13-year-old girl, instructing her on how to lose her virginity to an adult. These instances highlight the urgent need for a proactive approach to creating a child-safe AI environment.

With this in mind, Dr. Kurian proposed a comprehensive 28-item framework to help ensure that AI technologies will be catered to responsibly by stakeholders, companies and educators and will address children's unique needs and vulnerabilities.

"Children are probably AI's most overlooked stakeholders," Dr. Kurian said. "Very few developers and companies currently have well-established policies on child-safe AI. That is understandable because people have only recently started using this technology on a large scale for free."

It is important to bear in mind that even though chatbots have remarkable language abilities, they may not be able to handle the unpredictable or emotional aspects of a conversation properly. This is the reason why it tends to say something out of context, or even harmful, to children using AI without supervision.

AI's Dark Side Requires Parental Vigilance

Given the accessibility of AI nowadays, it is every parent's duty to keep a close eye on what a child is accessing online. If not, they could fall victim to the dangerous tactics lingering within this virtual world. One of the most common is AI-generated child sexual abuse material (CSAM). This refers to the use of AI algorithms to create fabricated, explicit content involving minors.

If unchecked, AI-generated CSAM could amplify sextortion as online predators can utilize these AI-generated images to threaten or coerce children into complying with their demands, whether it be money or inappropriate acts.

To address this, in April 2024, leading AI firms like Meta, Microsoft, Amazon, and OpenAI, signed the Safety by Design pledge to uphold child safety principles. These guidelines aim to combat sexual abuse involving children and the dissemination of AI-generated CSAM. The pledge mandates integrating these safety measures across the entire AI lifecycle, from early development to deployment and maintenance.

Another scenario includes AI-driven online grooming, wherein deepfakes are being used to make a person look unsuspicious or friendly. As algorithms become smarter, it becomes easier to detect a user's behavioral patterns, interests, and even emotional states, making grooming much easier to accomplish (especially in children).

Utilizing parental control tools offered by internet service providers or third-party applications to filter content, monitor online activity, and block access to inappropriate websites could be helpful in navigating this new landscape.

Staying informed about the latest trends and developments in AI technology and online safety, and regularly updating security settings on devices and software used by children, should also be entertained.

Protecting 'Generation AI'
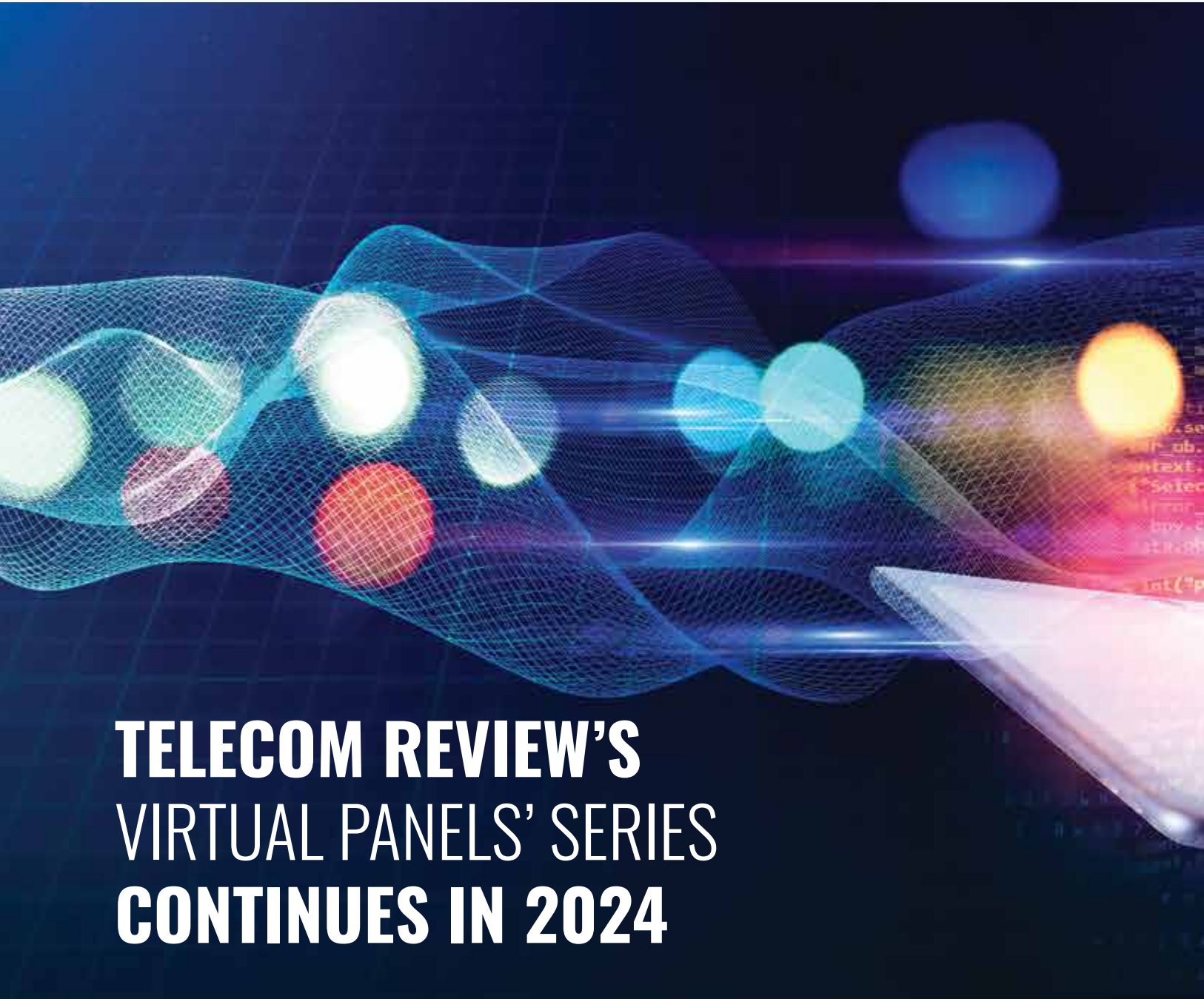
According to UNICEF, parents or caregivers are seen as key stakeholders in children's AI-powered lives. Yet, in the UNICEF-led workshops, some child participants acknowledged that most parents don't have sufficient knowledge on these topics, and expressed that their parents don't respect their privacy.

Once children get used to having AI around them, they could feel more inclined to interact with it. Interestingly, separate research revealed that children are much more likely to open up to chatbots as if they are human. Hence, Dr. Kurian's study suggests that the "friendly and lifelike designs" of chatbots could encourage children to trust them. This trust, when taken advantage of, could bring a child into a toxic situation.

Moreover, research by Common Sense Media found that 50% of students aged 12-18 have used ChatGPT for school, but only 26% of their parents knew that they were using this technology. At present, children are using chatbots informally as underage users cannot create their own accounts.

On a more positive note, Virginia Tech researchers are working to build and train AI-powered chatbots and help children and teens identify and avoid cyber predators. However, there is a lack of authentic cybergrooming conversation data—which is used to train the chatbots.

Despite this challenge, the researchers plan to approach the problem using human-centered approaches and establish an ethical platform in which adolescents and their parents can collaborate to generate the required data and enhance their awareness of cybergrooming as part of the data collection process. ▄

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Trash or Treasure? Uncovering the Hidden Value in E-Waste

The UN has revealed that the world's generation of electronic waste is rising five times faster than documented e-waste recycling initiatives. Embedded in this e-waste are over 30 billion kilograms of metals valued at USD 91 billion.

Seen as the new source of "green gold," e-waste shows a lucrative opportunity when processed right. In 2022, only 22.3% of e-waste was properly collected and recycled, leaving USD 62 billion worth of recoverable natural resources unaccounted for, posing increased pollution risks to communities globally.

Bearing this in mind, there is significant economic potential in the world's electronic waste, as discarded items contain valuable materials such as copper, gold, iron, aluminum, and other minerals and rare earth elements (REE) that can be extracted.

Why E-Waste Should Be Handled Better

Combatting climate change and powering modern innovation will require a significant amount of metals. Mining these metals harms ecosystems and communities due to the damage and pollution they cause.

This is why it is important to address a valuable source we're overlooking: the enormous amount of electronic waste produced each year.

Two of the most recyclable metals in e-waste are aluminum and copper, both of which are crucial for low- and zero-carbon technologies and the energy transition. However, in 2022, only 60% of the estimated 4 million metric tons of aluminum and 2 million metric tons of copper in e-waste were recycled.

On the other hand, REEs are crucial metals due to their supply risks and increasing demand across many industries. The IEA estimates that the demand for neodymium alone could reach 850,000 tons by 2030. If supply doesn't keep up with this demand, we can expect price spikes for neodymium, which could, in turn, increase the cost of wind power and electric vehicle batteries.

It is estimated that there were 7,248 metric tons of neodymium locked away in e-waste in 2022.

According to UNITAR's Kees Baldé, "No more than 1% of demand for essential rare earth elements is met by e-waste recycling. Simply put: 'Business as usual' can't continue."

This issue stems from underdeveloped recycling technologies and the high costs and difficulties of collecting these components from old tech.

Thus, recycling precious metals from e-waste is crucial for sustainable development, as it reduces the environmental impact of mining and helps conserve natural resources.

Innovations in E-Waste Recycling and Rare Earth Recovery

Currently, only about one-fifth of the world's e-waste is recycled. This amount has nearly doubled over the past 12 years and is expected to rise to 82 billion kg by 2030.

In light of this, a report from the World Economic Forum was released, highlighting the urgent need for systemic change to push industries towards a circular economy.

"Improved e-waste management could result in a global net positive of USD 38 billion, representing a significant economic opportunity while addressing climate change and health impacts," said Ruediger Kuehr, Senior Manager, Sustainable Cycles (SCYCLE) Programme, UNITAR.

The retrieval of valuable metals like gold, silver, platinum, and palladium from discarded electronic devices forms an integral part of recycling electronic waste, and it requires specialized equipment and expertise to extract the metals safely and efficiently.

Working with certified e-waste recycling companies that adhere to best practices in terms of handling and processing e-waste is essential, especially when it comes to ensuring the safe recovery of precious metals while protecting human health and the environment.

The recycling process required to recover precious metals involves collecting and sorting e-waste, then using techniques like chemical leaching, smelting, and electrolysis.

It has been noted that REEs are always found in compound form in natural ores and are hard to separate due to their chemical similarity. Traditional separation methods are very chemical- and energy-intensive and require multiple extraction steps.

In response, scientists from ETH Zürich are developing a process inspired by nature that efficiently recovers europium, a type of REE, from old fluorescent lamps. The approach could lead to the long-awaited recycling of rare earth metals which are indispensable for the modern economy.

The team of researchers, led by Victor Mougel, are deliberately focusing on recycling the raw materials, as this makes much more ecological and economic sense. "Our recycling approach is significantly more environmentally friendly than all conventional methods for extracting rare earth metals from mineral ores," says Mougel.

> It is important to address a valuable source we're overlooking: the enormous amount of electronic waste produced each year

A recent study by ETH Zürich presents a simple method for efficiently separating and recovering europium from complex mixtures of rare earth metals. The team is now working on adapting this process for other rare earth metals like neodymium and dysprosium (found in magnets).

Additionally, The Department of Energy's Pacific Northwest National Laboratory (PNNL) used a simple mixed-salt solution to separate valuable minerals in flowing reaction chambers. In February 2024, they successfully separated neodymium and dysprosium, which are typically hard to distinguish. This breakthrough could create new opportunities for recovering these essential rare earth elements from e-waste.

Apart from that, innovative recycling techniques like hydrometallurgy and pyrometallurgy help recover precious metals from circuit boards while reducing environmental impact compared to traditional mining.

Without a doubt, technology is, and will continue, to transform e-waste management. For instance, blockchain can track e-waste throughout its lifecycle, and new AI-driven advancements like automated sorting systems and eco-friendly extraction methods improve resource recovery and reduce waste.

From Disposal to Responsibility

Sustainable e-waste management is crucial for reducing environmental harm and protecting human health, preventing the problems caused by improper disposal and promoting the responsible handling and recycling of electronics.

For companies, adopting these practices is important for cutting emissions and building a strong brand reputation through corporate social responsibility (CSR).

For example, as part of its CSR strategy, Zain KSA has recently signed a strategic partnership with Ertiqa to roll out the second phase of its e-waste management and recycling campaign which aims to boost investment in the electronic waste management industry by recycling over 5,000 electronic devices.

Additionally, as part of its environmental sustainability action, Zain KSA was one of the first companies to support the "Recycle Your Device" e-waste recycling campaign launched by the Communications, Space & Technology Commission (CST), previously known as CITC.

Similarly, Ericsson's global product "Take-Back Program" aims to further its collaboration efforts to drive the responsible disposal and recycling of e-waste across the Group's network.

The best way to address e-waste is to reduce its generation. Encouraging a "buy less, use longer" mindset and promoting durable, repairable devices can cut e-waste significantly. Manufacturers should also focus on eco-design, creating products that are easier to disassemble, repair, and upgrade to extend their lifespan.

As part of sustainable approaches, there must be programs dedicated to refurbishing and repurposing electronics, making them available to individuals or organizations in need.

Research indicates that the UAE is among the leading producer of e-waste, but the government has launched several initiatives to manage its volume through secure channels, in collaboration with private sector organizations. In line with this, the Waste-to-Zero initiative, introduced at COP28 UAE, is set to be a joint effort between the Ministry of Climate Change and Environment (MOCCAE) and Tadweer (Abu Dhabi Waste Management Company) through which both entities strive to decarbonize waste.

In Egypt, the E-Tadweer mobile app already addresses e-waste by allowing users to drop off old appliances at designated points in exchange for vouchers to buy new electronics from participating stores, while in Saudi Arabia, CST partnered with ITU in a landmark global initiative to develop E-Waste Management Regulations. ᴛʀ

Unleashing the Power of Open-Source Solutions

Mobile service users are becoming increasingly selective and eager to try out service applications that are worth their time and money. For Communication Service Providers (CSPs), apps can maximize ARPU (Average revenue per user) by retargeting their users with add-ons and enriching their in-app experience.

To do so, apps need to diversify their monetization strategies beyond subscriptions and one-time purchases. Interestingly, adding AI features has resulted in increased revenue for service providers.

Moreover, the introduction of Application Programming Interfaces (APIs) has contributed immensely to the acceleration of the digital transformation journey across industries, including retail, healthcare, education, and finance among many others. CSPs need to identify APIs that can add value by enabling new applications and services and exposing them to the developer community. Bundling them into different business models and offering them at the right price are key ingredients needed to enhance profitability.

Facilitating Interoperability

Telecom networks are complex and require significant customization to meet diverse and evolving needs. To leverage 5G investments and improve return on investment (ROI) while providing better experiences for consumers, the industry must generate growth from new revenue sources through new services.

The open-source model, which promotes decentralized software development and open collaboration, has been crucial to the tech industry's development. In the communication industry, inclusivity is essential, making it imperative for startups and individuals to use free software to build solutions with minimal capital expenditure.

Open-source software is found everywhere. According to the latest annual survey by software support company, Red Hat, 90% of large companies use open-source software extensively in their operations. Indeed, the very reason that companies such as Facebook, Amazon, Microsoft and Google came to fruition is because of open-source solutions.

Open-source solutions can serve as valuable resources for training smaller

models used in various applications. Startups, enterprises, and governments should build customized models tailored to their specific goals. A key aspect of open-source solutions is that they are developed by experts, yet the framework allows anyone to scrutinize and improve the backbone. This collaborative approach fosters rapid innovation and ensures high-quality results.

Given the multi-faceted and highly distributed nature of telecom infrastructure, open-source solutions offer a unified approach that enables CSPs to address current and future use cases, including OpenRAN, next-generation Core (5G and beyond), cloud, and AI at the edge.

Additionally, open-source software powers Android, the world's most widely used smartphone operating system, and is utilized in video games and automotive software.

Embracing Open Collaboration

By leveraging open-source projects, telecom operators can tap into the latest advancements and best practices developed by a global community of experts. In the UAE, e& UAE has consistently embraced these standards through the Open Digital Architecture (ODA) presented by TM Forum.

To streamline operations, minimize manual errors, and boost the quality of services, e& UAE launched a state-of-the-art Developer Portal, which provides free access to a suite of well-defined, standardized, and interoperable APIs. The portal serves as an arsenal for digital innovators to discover, explore, and utilize an extensive range of APIs in service management, customer management, product catalog, billing, and network exposure, creating cutting-edge solutions that drive the future of connectivity.

e& UAE's broader ODA journey focuses on system decoupling and application simplification. By adopting open APIs, e& UAE is achieving simplified integration and interoperability within its systems, facilitating secure, standardized access to data and functionalities.

Similarly, in 2022, UAE telecom operator, du, launched open-source solutions to develop a cutting-edge blueprint for a private 5G network based on Open RAN (ORAN) technology. This initiative aims to revolutionize 5G private wireless deployments for operators and foster industry collaboration for edge infrastructure and application deployment, thereby unleashing the full potential of 5G.

The Open Compute (OCP) Telco Project collaborates with telecom companies and carriers as well as sub systems, software, board and semiconductor suppliers seeking to use data center infrastructure to deliver IT services. Technologists across industries participate in this community to create and improve designs to help companies transition from traditional or existing proprietary solutions to OCP solutions with interoperable, multi-vendor supplier support. Leading vendors, such as Huawei, Ericsson and Nokia have been long-term proponents of open-source solutions, contributing immensely to the developer community.

According to research conducted by McKinsey, GSMA Open Gateway and others, network API initiatives will unlock significant value for the telecommunications industry and businesses using 5G networks over the next six years. It's forecast that, if operators can expose more of their network APIs and innovations to enterprise developer and cloud provider communities, then they can unlock a potential USD 300 billion market opportunity by 2030. The GSMA Open Gateway initiative is focusing on how it can help members ramp up developer engagement in 2024 through new services and a focus on three go-to-market commercial channels for open API adoption.

For the next generation of technology, AI and VR are critical components. Ensuring access to leading AI solutions involves building them and establishing them as industry standards through sharing and ecosystem development. GitHub, the Microsoft-owned collaborative developer community,

exemplifies this approach by enabling over 100 million developers to become AI engineers and build with industry-leading AI models. Developers can access models like Llama 3.1, GPT-4o, GPT-4o mini, Phi 3, and Mistral Large 2 via a built-in playground to test different prompts and model parameters, all while maintaining a commitment to privacy and security.

Considerations for Open-Source Architecture Implementation in the Telecom Sector

Cost Efficiency: Since licensing fees are non-existent in open-source solutions, software components tend to cost less.

Flexibility and Customization: Open-source architecture allows for greater flexibility, enabling telecom operators to adapt and innovate quickly by modifying the software according to their requirements.

Low-Risk Vendor Lock-Ins: As opposed to proprietary solutions, where operators become dependent on a single supplier for updates, support, and integration, open-source architecture minimizes this risk by providing alternatives and enabling greater control over the technology stack.

Security and Transparency: With increased scrutiny of the code, vulnerabilities can be identified and addressed, facilitating transparency and trust-building among stakeholders.

Regulatory Compliance: In a highly globalized ecosystem, in some regions, regulations may favor or require open standards and transparency. Open-source solutions can help telecom operators comply with such regulations more easily.

In Conclusion

In an increasingly digital-first world, open-source architecture in the telecom sector supports cost efficiency, customization, interoperability, and innovation while reducing vendor lock-in and enhancing security. Open-source solutions enable operators to stay competitive and agile amidst the dynamic and evolving nature of telecom networks. **IR**

Next-Gen Optical Networks: Record Speeds and New Capabilities

Researchers have set a new data transmission record of 402 terabits per second (Tbps) using standard optical fiber. These fibers are indispensable to modern communication infrastructure, and are criticial in addressing the capacity demand needed to support networks in the 5G-Advanced and 6G eras.

D ue to their capability to transmit light signals over long distances with higher bandwidth, optical fibers are becoming increasingly valuable. Notably, the market was valued at around USD 7.4 billion in 2023.

The demand for high-speed internet and continuous advancements in telecom infrastructure are major factors driving this market's growth. In addition, the increasing 5G and cloud adoption highlights the essential role of optical fibers, apart from its application in fields such as medical imaging, automotive systems, and various industrial use cases.

The Optical Communication Infrastructure

Optical communications act as the basis for transformative information exchange. The transmission capacity per optical fiber can generally be increased by using wavelength division multiplexing (WDM), in which the wavelength of light is slightly changed for multiplexed transmission.

With this in mind, research and development (R&D) efforts worldwide are enhancing cable capacity with technologies like multi-core fibers, hollow-core fibers, and space-division multiplexing. As a result, the boundaries of data transmission capabilities are tested and extended, and more cost-effective and easier-to-install fiber-optic cables are emerging due to material and manufacturing enhancements.

In optical communications, spectrum refers to the operating range of an optical fiber. Multiple bands such as O, E, S, C, L and U are utilized to achieve varied ranges. Each wavelength within this range carries a distinct data stream, capable of traveling over long distances.

Similar to lanes on a highway, an expanded spectrum allows multiple wavelengths to transmit data simultaneously, increasing the number of data channels that can operate in parallel. Moreover, optical technology lacks an electromagnetic field, ensuring data remains secure from interception, signal degradation, or interference with other signals.

Huawei suggests that carriers must replace copper lines with optical fibers and implement fiber-to-the-home (FTTH) solutions to achieve all-optical coverage and provide 100 Mbps of home bandwidth. Additionally, carriers should gradually upgrade to 10G PON, extend optical transport networks (OTN) down to metro networks, and develop 3D-mesh backbone networks that are ready for 400G capacity.

Optical Fiber Deployment

Optical fiber networks have advanced to support modern technology needs, leading to a rise in FTTH connections in fixed broadband. As explained by Nokia, initially, C+L band networks were used by operators with high traffic and limited long-haul fiber capacity, similar to hyperscalers that built "super-highways" across continents.

Others, such as operators in Japan and Italy, used L-band solutions to enhance WDM capacity over Dispersion Shifted Fiber (DSF) networks. Consequently, those operators struggled to scale in the C-band due to four-wave mixing.

Currently, C+L band solutions are being widely deployed in metro and long-haul networks by various operators, including CSPs, cable operators, and enterprises to effectively double network capacity and prevent fiber capacity exhaustion.

Ultimately, by expanding available spectrum from the C-band to include the L-band and S-band, operators can access up to 60nm of usable spectrum, further boosting fiber capacity.

Momentum in the Middle East and Globally

The UAE has emerged as a global leader in FTTH connectivity, alongside Singapore, Hong Kong, China and South Korea. In line with this, several Middle-Eastern operators in countries including Bahrain, Jordan, Qatar, and the UAE, are increasingly deploying gigabit packages, which has significantly boosted their speed rankings, according to Ookla's Speedtest Global Index.

In Q1 2024, the UAE ranked first in the Middle East for fixed broadband performance, with a median download speed of 270.91 Mbps and an upload speed of 124.37 Mbps. Bahrain and Qatar also showed notable gains in both download and upload speeds, while Jordan's median download speed quickly increased from a low base, overtaking Saudi Arabia.

In 2022, Nokia, in collaboration with e& UAE, demonstrated the first 100 Gbps fiber broadband speed—the fastest PON speed in the MEA region at that time.

Due to this relentless demand, ISPs are addressing indoor performance bottlenecks with modernized consumer premises equipment. In addition, ISPs have started deploying fiber-to-the-room (FTTR) for ubiquitous gigabit wireless access indoors, with Omantel being the first ISP in the Sultanate to offer this technology. This solution guaranteed enhanced customer experience in every room.

> The demand for high-speed internet and continuous advancements in telecom infrastructure are major factors driving this market's growth

At the Telecom Review Global Excellence Awards 2023, Bahrain Network (BNET) won the "Best Fiber Infrastructure Deployment – Global" award. Its national broadband all-optical network provides diversified telecom services and covers 95.4% of households.

In Asia, KDDI, Sumitomo Electric, Furukawa Electric, and OFS recently achieved a high-capacity transmission of 115.2 THz using a high-density 12-core optical fiber and O-band coherent DWDM technology, which reduces inter-core crosstalk.
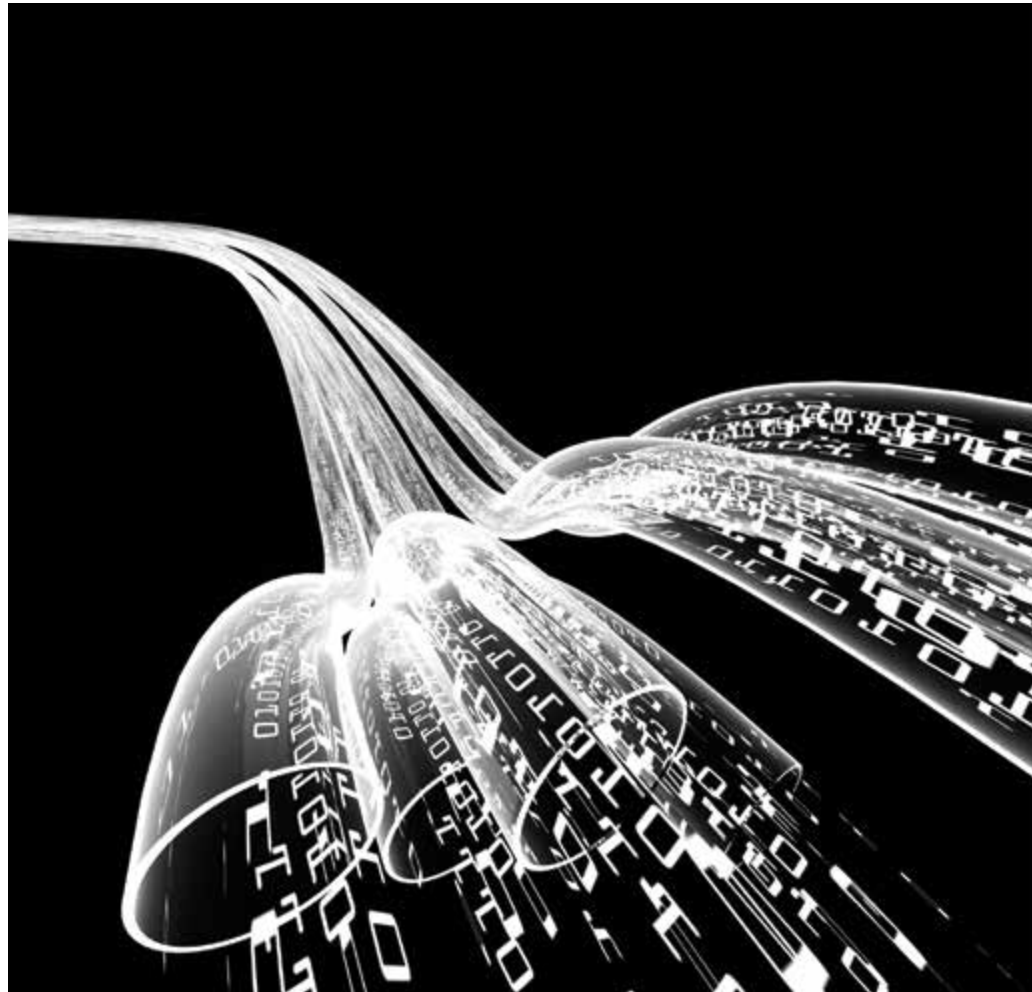
Meanwhile, researchers from the National Institute of Information and Communications Technology (NICT), along with Nokia Bell Labs, Aston University, and Amonics PLC, set a record data rate of 301 terabits per second in standard optical fiber. To put this into perspective, this speed is over 100 million times faster than Netflix's recommended 3 Mbit/s for HD streaming.

Nokia has also set two world records in submarine optical transmission, highlighting the potential of future optical networking equipment. In March 2024, NEC and NTT completed the world's first transoceanic transmission over 7,280 km using a 12-core multicore fiber, which could be key to future high-capacity optical networks via submarine cables.

A Positive Outlook
Beyond the Middle East, various other regions are supporting the unfaltering pursuit for next-gen optical network expansion with contributory initiatives. The EU has implemented several R&D initiatives focusing on next-gen optical networks. Projects like PASSION aim to develop ultra-high-capacity optical networks using photonic technologies. PASSION's research focuses on utilizing novel wavelength-division multiplexing techniques to scale bandwidth while ensuring energy efficiency, supporting the rise of 5G and IoT.

In Asia, The National Institute of Information and Communications Technology (NICT) in Japan is conducting pioneering research on beyond-5G optical networks. Their focus includes space-division multiplexing (SDM), and their experiments have demonstrated the potential for petabit-per-second data transfers, which are essential for data-heavy applications like AI and cloud computing.

In North America, The COSMOS project, funded by the U.S. National Science Foundation (NSF), is focusing on developing next-gen optical networks capable of supporting smart city applications.

As research in the optical fiber communication field continues to advance, we are paving the way for future improvements in global internet infrastructure, potentially leading to faster and more efficient data transmission capabilities in the coming decades. **TR**

> Beyond the Middle East, various other regions are supporting the unfaltering pursuit for next-gen optical network expansion with contributory initiatives

stc Group and New Murabba Bring Smart Tech to Urban Developments in Saudi

stc Group and New Murabba (a PIF Company) have signed a strategic partnership agreement to enhance and facilitate the implementation of advanced communications and information technology at New Murabba.

Under the agreement, stc Group aims to drive more digital and technological transformation across major projects in the Kingdom, enhancing infrastructure and digital services within its real estate sector by leveraging the most advanced solutions.

Eng. Olayan Alwetaid, CEO of stc Group, said, "This strategic partnership reflects stc Group's excellent digital ecosystem and its ongoing commitment to driving digital transformation and being a key enabler of national development. New Murabba represents a major national initiative, and we are deeply committed to supporting it by providing the latest digital technologies."

Michael Dyke, CEO of New Murabba, said, "Our strategic partnership with stc Group will position New Murabba as a pioneering urban development that enhances quality of life and serves as a global example of innovation and sustainability. This collaboration will further establish New Murabba as one of the world's most transformative, modern downtowns."

This strategic alliance covers the potential implementation of all projects related to information and communication technology (ICT) infrastructure. It also includes the utilization of stc Group's diverse and innovative digital solutions, supported by their expertise in smart city development. These solutions will encompass key elements such as the Internet of Things (IoT), artificial intelligence (AI), cloud services, and cybersecurity.

Riyadh: A Global, Modern Metropolis
New Murabba is shaping new standards for urban development in the Kingdom, and championing Riyadh's transformation into a global, modern metropolis. The destination will seamlessly integrate technology with nature and sustainability, driving the capital's evolution and improving living standards. At the heart of New Murabba is the Mukaab, an architectural icon measuring 400 meters in height, width, and length, making it one of the largest urban structures in the world.

Ooredoo Group Secures Largest Investment in Qatar's Tech History

Ooredoo Group has announced a landmark QAR 2 billion financing deal with QNB, Doha Bank, and Masraf Al Rayan, to accelerate the growth of its data center and AI business.

The 10-year hybrid facility, which comprises commercial and Islamic tranches, is the largest transaction—both in terms of value and tenor—ever achieved in Qatar's tech sector, underscoring leading financial institutions' confidence in Ooredoo's strategic vision.

The funds will be strategically allocated to carve out existing data center assets from Ooredoo's telecom operations, with a significant portion directed toward expanding capacity and upgrading infrastructure to support the growing demand for AI, cloud services, and hyperconnectivity in the MENA region.

Aziz Aluthman Fakhroo, Group CEO, Ooredoo, said, "The MENA region is one of the fastest growing markets for data centers worldwide, and there is significant untapped potential in AI, cloud services and accelerated computing. This financing deal marks a major milestone in our strategic vision for expanding our data center and AI business, and we are excited to meet the region's increasing demand while upholding our commitment to sustainable, energy-efficient infrastructure."

Abdulla Mubarak Al-Khalifa, QNB Group CEO, added, "We expect the data center market to grow significantly over the coming years, and by supporting Ooredoo, we are investing in the future of AI and cloud services. This collaboration also strengthens Qatar's leadership in technological innovation. We look forward to working closely with Ooredoo Group as this market evolves."

Fahad Al Khalifa, Group CEO, Masraf Al Rayan, commented, "By partnering with Ooredoo, we are investing in the future of digital infrastructure and supporting sustainable growth through innovation and economic diversification. We are proud to be at the forefront of this significant initiative, which will undoubtedly cement Qatar's position as a leader in the digital economy."

Nokia and Zain Iraq Brace for Data Surge and High Network Demand

Nokia has announced a strategic partnership with Zain Iraq to upgrade its telecom operator network in the south of Iraq. The three-year deal marks Nokia's first entry into the microwave (MW) business with Zain Iraq, enhancing network capacity and modernizing the infrastructure to support future growth and increased traffic demand.

The deployment will begin immediately, with a focus on optimizing network performance and ensuring scalability to accommodate future growth. Nokia's solutions will help Zain Iraq to expand the network capacity and enhance customer experience while paving the way for future innovations in the region.

Zain Iraq has been experiencing increasing demand for its data services and the expansion is necessary to provide the best service to its customers. Nokia will implement its state-of-the-art microwave technology, including its latest E-band solutions, to upgrade Zain Iraq's MW backbone. This upgrade will increase network capacity and prepare the network for the anticipated data surge driven by rising customer usage.

Market-Leading UBT-T XP for Future Growth

This deal involves swapping out competitor equipment and introducing Nokia's high-capacity microwave solutions. Central to this deployment is the UBT-T XP version, which offers the highest transmit power in the market. This technology reduces antenna sizes and tower load, delivering significant capital expenditure (CapEx) and operational expenditure (OpEx) savings.

Mikko Lavanti, Senior Vice President of Mobile Networks at Nokia MEA, said, "This deal underscores our strong local capabilities and expertise. By deploying our advanced microwave solutions, Zain Iraq will benefit from an optimized network that is ready to handle the demands of the future, including meeting the needs of its growing customer base."

Meanwhile, Emre Gurkan, CEO of Zain Iraq, said, "Our partnership with Nokia enables us to overcome capacity limitations and modernize our network infrastructure. With Nokia's advanced microwave technology and E-band solutions, we are not only resolving current challenges but also future-proofing our network for future growth."

touch Achieves New Record in Lebanon

touch has strengthened its leading position in the telecommunications and mobile data sector in Lebanon by documenting a record number in terms of its customer base, the highest in the history of mobile companies in Lebanon.

As of August 2024, touch reached 2.57 million customers, maintaining the largest share of the total number of mobile telecommunications and data users for over twenty years.

In this context, touch confirmed that this distinguished achievement is the result of the efforts and dedication of all employees who shared one goal: to provide the best customer service to all its customers wherever they are.

"We would like to express our sincere gratitude to all our loyal customers, and we are proud that touch is the first choice of the Lebanese as a mobile operator in the Lebanese market, especially since our team works hard to maintain touch's leading position," said touch Chairman and CEO, Dr. Salem Itani.

touch's record-breaking customer base also reflects its constant commitment to diversifying its services and products to meet the needs of different segments of Lebanese society, and providing innovative offers on various occasions.

This is in addition to adopting a continuous and renewed development approach to enhance the network performance and improve the quality of its communications and data services.

Dr. Itani concluded, "We are committed to building on this success, challenging ourselves further to achieve further improvement in customer service, and innovating unique products in order to ensure our customers' satisfaction."

Omantel Successfully Conducts 5G RedCap Trial

Reflecting its unwavering commitment to enhancing Oman's digital infrastructure, Omantel has successfully conducted a laboratory trial of RedCap, an advanced 5G technology. This innovation promises higher speeds and greater efficiency for the 5G network at a lower cost, adding significant value to the services offered to Omantel customers.

This initiative aligns with Omantel's strategic goal of providing unparalleled digital solutions. Developed in collaboration with Huawei, RedCap represents a significant advancement in 5G technology, aimed at improving internet connectivity and expanding the range of applications available to users.

Dr. Ali bin Said Al Hashmi, General Manager of Infrastructure Planning and Design at Omantel, remarked, "We are excited to pioneer advanced technological solutions within the Sultanate of Oman. Our efforts contribute to accelerating the digital transformation process and fostering a knowledge-based economy in line with Oman Vision 2040's objectives for the technology sector. Our goal is to elevate service standards for both business and individual subscribers, ensuring access to world-class services."

Oman's Digital Future

Designed to meet the evolving demands of Internet of Things (IoT) applications, RedCap offers high speeds and energy efficiency, making it ideal for a range of devices, from smart wearables to advanced industrial equipment. This technology ensures fast and seamless user experiences while extending the battery life of connected devices, thereby reducing operational and maintenance costs.

Dr. Al Hashmi further noted, "The successful trials of RedCap's 5G technology mark[s] a significant milestone in our journey toward a thriving digital future for Oman. We believe this technology will revolutionize the telecommunications sector and unlock new opportunities for innovation and business growth."

The benefits of RedCap technology extend beyond superior internet speeds. It paves the way for diverse applications, including remote monitoring, industrial process optimization, and enhanced healthcare solutions, among others.

Through the integration of its operations, processes, and extensive expertise in communications and digital technology, Omantel has established itself as a leading telecommunications company in Oman and beyond. The company's innovative approaches have delivered state-of-the-art solutions to various consumer and business sectors, such as cloud computing, AI, smart solutions, cybersecurity, and more, driving innovation and leadership in new and advanced technologies.

Umniah Teams Up with Sprinklr for AI-Powered Customer Solutions

As part of Umniah's ongoing commitment to improving customers' experiences and enhancing operational efficiency, the company has begun integrating Sprinklr's cutting-edge AI solutions.

Khaldoun Sweidan, Chief Commercial Officer, Umniah, said, "Cooperating with a global company like Sprinklr comes as part of Umniah's strategy for digital deployment and strengthening its position as one of the leaders in the ICT sector in the region. Through these innovative solutions, we aim to improve the level of our services and ensure a quick and effective response to our customers' needs, which enhances our ability to compete in the market and to provide an unprecedented experience."

According to Umniah, intelligent robots are able to understand and respond to customer inquiries in real time, reducing waiting times and significantly enhancing customer satisfaction.

Haitham Elkhatib, Vice President of Sprinklr in the Middle East, Africa and Asia, commented, "We at Sprinklr are pleased to cooperate with Umniah to provide AI solutions that will contribute to achieving a qualitative leap in its customers' experience. Our capabilities to provide comprehensive and integrated solutions for customer experience management, starting from social media analysis to smart chatbots, will enable Umniah to achieve deeper and more effective communication with its customers."

This new AI integration works alongside existing AI and ML capabilities enabled by Ericsson. These include Ericsson's Cognitive Software portfolio for network enhancement and Ericsson's Service Continuity Power Saving solution for cost savings and reduced environmental footprint.

CrowdStrike-Microsoft Outage: A Wake-Up Call for Cloud Dependency and Cybersecurity

Did you see the blue screen of death on July 19, 2024? If yes, then you are one of the 8.5 million Microsoft users that were affected by CrowdStrike's faulty software update.
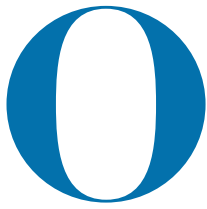
Over the years, software bugs and glitches have been responsible for banking failures, power shortages, and medical device malfunctions, among other circumstances. Also making this list is the CrowdStrike-Microsoft outage, which occurred on July 19, 2024, and cost firms billions due to destructive influence within the cloud.

From rail transportation systems to aviation, small businesses, banking, emergency operations and hospitals, the outage resulted in substantial financial losses. In fact, the downtime not only led to direct revenue loss but also incurred costs related to system recovery and manual intervention.

Long-term consequences on customer trust and operational efficiency are expected following the massive global outage.

Impact of Digital Fiasco
On July 19, CrowdStrike released a Rapid Response Content configuration update for the Windows sensor to gather telemetry on possible novel threat techniques. These updates are a regular part of the dynamic protection mechanisms of the Falcon platform, but due to a bug, it resulted in a Windows system crash.

Telecom Review was fortunately not affected, along with users of Mac and Linux hosts.

CrowdStrike's security code runs at the kernel level in Microsoft Windows, forming a core part of the operating system that provides deep access, giving CrowdStrike's Falcon security software the privilege of better threat detection across a computer system.

However, evidently and unexpectedly, it can crash Windows computers if it faces major issues. All the devices were reportedly "infected" by the faulty update within just a 78-minute-long window before CrowdStrike reverted the update.

When the outage hit, a lot of establishments went 'blue' worldwide.

The incident underlined the critical interdependence between cybersecurity solutions like CrowdStrike and operating systems like Microsoft Windows.

The CrowdStrike-Microsoft outage is expected to cost Fortune 500 companies a total of USD 5.4 billion in direct financial losses, averaging USD 44 million per company, according to data from Parametrix. Approximately 70% of Fortune 100 companies were impacted, and industries such as airlines, banking, healthcare, and media experienced a tough blow.

Moreover, a research report unveiled that the faulty CrowdStrike Falcon Sensor update and subsequent outage resulted in a loss ratio impact of roughly 3% to 10% on current global cyber, totaling USD 15 billion.

This scale of loss could potentially place this global outage as the single largest insured loss event in the history of the cyber insurance industry's operations over the past two decades.

While only 1% of CrowdStrike's total customer base of Windows devices was reportedly impacted, the broad economic and societal impacts highlight the extensive use of CrowdStrike within enterprises' critical services.

In the aftermath, Microsoft is collaborating with other cloud providers and stakeholders, including Google Cloud Platform (GCP) and Amazon Web Services (AWS), to create awareness regarding the state of impact.

"This incident demonstrates the interconnected nature of our broad ecosystem—global cloud providers, software platforms, security vendors and other software vendors, and customers. It's also a reminder of how important it is for all of us across the tech ecosystem to prioritize operating with safe deployment and disaster recovery using the mechanisms that exist," noted David Weston, Vice President, Enterprise and OS Security, Microsoft.

Lesson Learned... The Hard Way
Regulators and researchers have identifed big tech's cloud service consolidation as the root issue. Notably,

Microsoft, a key rival to Amazon, saw its Azure platform's market share reach 25% in Q1 2024, according to Statista.

Along with CrowdStrike, Microsoft also dominates the end-point security market, which ensures cybersecurity for devices like desktops, laptops, and mobile devices. This consolidation led to the connectivity spiral on July 19.

The outage highlighted how fragile our global tech infrastructure is, as well as the testing processes of cybersecurity firms. It underscores the urgent need for rigorous testing and accountability in software updates to prevent future failures.

Brands in critical sectors, such as airlines and healthcare, should prioritize strengthening resilience, optimizing vendor management, and ensuring effective contingency plans to protect themselves against future disruptions.

Without a doubt, the incident served as a wake-up call for businesses worldwide, prompting them to re-evaluate their reliance on single operating systems and urgently diversify their IT infrastructure.

In the cybersecurity realm, the outage is expected to have long-lasting impacts on policies and practices, highlighting the vulnerability of even the most secure systems to unexpected issues, and underscoring the necessity for robust incident response plans and fail-safe mechanisms.

There is also a rising concern that the turbulence might prompt some firms to disable their EDR tools, a risky decision as hackers are currently exploiting the situation and targeting affected companies.

Making matters worse is the consequent increased lack of faith in cyber products. This hesitancy is likely to impact the entire cyber community for months to come. Despite the notion that cybersecurity should protect a system from the outside, an internal flaw could also have a disastrous outcome. CTOs and CIOs, who are already trying to convince boards to invest more in security tooling, will now feel more pressure.

It's important to recognize that no company is ever completely secure; even the largest and most established organizations must remain vigilant, continually updating and fortifying their systems.

The Way Forward

To prevent outages of this magnitude from occurring again, the software development processes that IT professionals are enlisting today are, and should continue to be, proactive and built with zero-trust principles in mind.

Ironically, in 2020, Microsoft and Altran collaborated to develop the Code Defect AI tool to predict the likelihood of bugs in source codes created by developers early in the software development process.

In 2021, Telecom Review spoke to CrowdStrike about the introduction of the Falcon Zero Trust Identity Security solution in the Middle East and ascertained that an identity-centric, zero-trust architecture is key to mitigating cyberthreats targeting telecommunications sector in the region.

In the same context, Microsoft emphasized the importance of zero-trust architecture to Telecom Review, citing it as the emerging "global standard for enterprises." The defining principle of a zero-trust strategy is "never trust, always verify". Hence, every time a user, device or application tries to establish a connection, that attempt should be strictly authenticated and authorized within the system.

CrowdStrike has since shared some measures to prevent the scenario from happening again. These include: software resiliency and testing, Rapid Response Content deployment, and third-party validation.

To improve Rapid Response Content testing, various testing types can be utilized, including local developer testing, content update and rollback testing, stress testing, fuzzing, and fault injection.

More importantly, it is imperative to implement a staggered deployment strategy for Rapid Response Content in which updates are gradually deployed to larger portions of the sensor base, starting with a canary deployment.

This aligns with security experts' recommendations that "a staged rollout procedure" when publishing Rapid Response Content updates could have helped prevent the issue.

For example, when addressing the fault diagnosis phase, Huawei's Telecom Foundation Model employs sophisticated chain-of-thought intelligent analysis capabilities, swiftly pinpointing the root causes of issues and significantly reducing the number of alarms.

In the ICT landscape, testing and assurance has indeed become prevalent, particularly in telcos who are building private networks, because they want to make sure that these networks are very reliable and provide low latency.

Realize has taken the lead in ensuring efficient and reliable network operations. The company provides CSPs with cutting-edge tools, services and expertise to disrupt traditional means of network management, including AI/ML-powered autonomous network monitoring with anomaly detection, root cause determination and streamlined remediation.

As part of the evolution to an agile network architecture, Huawei and stc Group partnered to implement the first CDCT (Continuous Delivery Continuous Testing) validation under the Telco Cloud Partnership program in KSA in 2023.

The CrowdStrike-Microsoft outage magnified the importance of having an up-to-date business continuity plan that emphasizes communication procedures, which can get complicated if systems are down. And it pushed some leaders to figure out whether they have enough contingencies in place to ensure that operations can continue should a situation similar to this occur again.

The Nokia Cybersecurity Dome was highlighted as one of the relevant breakthrough innovations addressing the aforementioned issue during a recent Telecom Review webinar. It is an overarching solution for threat identification, detection, and verification that leverages AI.

MYCOM OSI also works collaboratively with customers to understand their business and economic drivers, processes, people, and ambitions. The company's AIOps solutions offer proactivity and automated analysis, in line with zero-touch assurance and dark NOC programs.

Organizations are also reassessing their emergency staffing, addressing the need for outsourced help, and rethinking the value of storing key recovery data in multiple locations.

From a consumer perspective, a netizen expressed that the global outage is alarming, comparing it to a war situation. "The West goes down (as it did) because we are all using a Microsoft system. Russia and China stay up and ready to go because they don't use a Microsoft system."

Food for Thought

The shift to cloud computing has led many companies to rely on big tech giants for their server needs instead of building their own infrastructure. Fortinet's 2023 State of Zero Trust report shows a growing number of organizations adopting zero-trust strategies to secure their cloud environments. However, challenges remain.

Industry experts have pointed out that the CrowdStrike-Microsoft issue highlighted the risks of dependency on just a few major players. True resilience means ensuring operations can continue, even if failures occur repeatedly.

In reality, this resilience can be achieved by installing multiple process controllers in a distributed mesh, similar to a controller data center. Control methods are no longer limited to a single physical controller. This is merely the first step toward autonomous operations, which will predictably appear in a variety of settings and across a wide range of activities and disciplines. **TR**

Can AI Think Like Us? Unveiling the Science Behind Human Decision-Making

Humans make nearly 35,000 decisions each day, and each decision involves evaluating options, recalling similar past situations, and feeling reasonably confident about the right choice. With its real-life potential, artificial intelligence (AI) is making more human-like decisions and influencing how people do things.

AI significantly enhances human decision-making by providing powerful tools for data analysis, prediction, and automation. However, it does not truly "think" like humans and comes with challenges that require careful management to ensure ethical, fair, and responsible use.

Thomson Reuters describes neural networks as a computational method that mimics the human brain's data processing capabilities. Neural networks, a form of machine learning (ML), utilize interconnected nodes (or artificial neurons) to derive insights from extensive datasets.

Humans Versus Neural Networks

In the study of cognitive processes like human decision-making, extensive research has been conducted. To understand and predict how individuals make decisions, quantitative models of human decision-making have significantly contributed to research in both the social sciences and engineering.

In one of the studies, researchers trained exploratory deep neural networks (DNNs) and found out that predictable decision patterns that are not solely reward-oriented may contribute to human decisions. Importantly, they demonstrated how theory-driven cognitive models can be used to characterize the operation of DNNs, making DNNs a useful explanatory tool in scientific investigation.

Currently, researchers at Georgia Tech are working on RTNet, a neural network that mimics human decision-making by incorporating variability and confidence in its choices. This network not only matches human performance in digit recognition but also improves accuracy and reliability with traits like confidence and evidence accumulation.

When considering whether AI can think like humans, it's important to recognize the fundamental differences. AI can mimic certain aspects of human thinking, such as pattern recognition

and problem-solving, but it lacks true understanding. AI processes data and generates outputs based on learned patterns without genuine comprehension or consciousness. It doesn't experience emotions, self-awareness, or subjective experiences as humans do.

For example, large language models (LLMs) often "hallucinate" by confidently presenting incorrect or unjustified data. Unlike humans, who would admit uncertainty, LLMs may fabricate answers even when it is not precise. Moving forward, developing more human-like neural networks could improve accuracy and prevent misleading information.

After obtaining results from their model, Georgia Tech researchers compared them with those of human participants. Sixty students reviewed the same dataset and reported their confidence levels. The researchers then found that the neural network's accuracy, response time, and confidence patterns closely mirrored those of the human participants.

The research team hopes to train the neural network on more varied datasets to test its potential and apply this model to other neural networks to enable them to rationalize more like humans.

In an effort to understand "AI hallucination," Telecom Review posed the question, "Find the name of an AI Act in the UAE" to LLM, ChatGPT. It responded with, "The United Arab Emirates (UAE) has been proactive in establishing the UAE AI Act aimed at fostering responsible AI usage," citing irrelevant hyperlinked sources. Upon analyzing its answer, the journalists and editors at Telecom Review deemed the information inaccurate (no AI Acts have been established in the UAE thus far) and, ultimately, a fabrication designed by ChatGPT to please the user's initial query.

Could this machine-learned need to please the user be considered a developing conscious ability in AI?
While machine learning can speed up the discovery of predictive models for

human judgments, these models often suffer from limitations such as small datasets and poor interpretability. However, another study suggests that combining large datasets with machine-learning algorithms holds great promise for revealing new cognitive and behavioral phenomena that would be hard to uncover otherwise.

According to one study, decision-making models created by human researchers generally outperform machine-learning models when using data volumes typical of past behavioral research. But this trend shifts when larger datasets are available, suggesting that the complexity of psychological theories has been limited by the scope of data previously used.

As the world begins to move into a regime governed by big behavioral data, theories will need to become increasingly complex to be able to capture the systematic variation that these larger datasets possess.

Currently, AI demonstrates narrow intelligence, excelling in specific tasks but lacking in general intelligence that enables humans to understand and learn any intellectual task. Achieving general AI, capable of thinking and learning as humans do, remains an aspirational goal and is far from being realized.

AI: Enhancing Decision Making Across Various Fields
Cognitive computing blends machine learning, language processing, and data mining to support human decision making. With this in mind, AI-powered systems leverage historical data to predict outcomes with high accuracy, aiding critical decisions. MYCOM OSI, a leader in telecommunications service assurance, is leveraging AI to revolutionize decision-making processes for Communication Service Providers (CSPs) with its latest launch, EAA GenAie.

AI is being observed in in healthcare, where it can be used to forecast disease outbreaks or suggest personalized treatments. Etisalat's healthcare platform is transforming the

UAE's medical sector by leveraging AI to empower healthcare providers with advanced data-driven decision-making tools. In the realm of early disease detection, VR research has revealed promising advancements in identifying early signs of Alzheimer's risk. In another groundbreaking development, engineers at the University of Waterloo have designed a highly efficient antenna small enough to be housed within a ring, capable of transmitting crucial medical data to both healthcare providers and individual patients.

AI is also being used to predict market trends and evaluate risks, leading to better investment decision making.

By automating routine tasks, AI enables humans to concentrate on strategic and creative endeavors, fostering innovation and efficiency.

On the contrary, the integration of AI into decision-making processes is not without its challenges. Since AI systems learn from data, any biases in the data are likely to be mirrored in the AI's outputs, potentially resulting in unfair or discriminatory outcomes.

Along with this, the opacity of decision-making processes in complex algorithms, such as deep learning, complicates the identification and correction of these biases.

Another concern is the risk of over-reliance on AI, which could diminish human decision-making skills and critical thinking. As we increasingly depend on AI for routine tasks, we are less likely to make independent, informed decisions. Moreover, ethical issues arise regarding responsibility and accountability when AI-driven decisions fail, such as in autonomous car crashes or poor investments made using AI-powered financial systems.

In conclusion, the synergy between human intuition, creativity, and AI's computational prowess can lead to remarkable advancements if balanced. As we navigate this evolving landscape, the key lies in harnessing AI's potential for decision-making while addressing its limitations and ethical implications. **TR**

Huawei and du Attain Another Milestone with 5G-Advanced Network in the Middle East

Huawei, in partnership with du, commercially rebranded from Emirates Integrated Telecommunications Company (EITC), has achieved a significant milestone in solidifying du's journey towards implementing a 5G-Advanced network.

du has become the first to successfully deploy Huawei's 5G LampSite X 'Digital Indoor Solution' using three carrier aggregation (3CC) technology in the Middle East. This achievement further strengthens du's leadership in the 5G user experience market, delivering a peak data rate of 5.1 Gbps.

First Ubiquitous Indoor Gbps Network In 2021, du, in collaboration with Huawei, pioneered the first ubiquitous indoor gigabit-per-second (Gbps) network. This new joint innovation aims to significantly enhance the capabilities of mobile networks, improving connectivity in indoor spaces such as shopping malls, hotels, airports, and residential buildings.

As a leading player in the 5G market, du has seen remarkable results from this achievement. 5G user traffic now accounts for over 60% of total mobile traffic, surpassing the combined traffic of 4G and 3G networks. The widespread adoption of 5G services demonstrates the success of du's network, and the deployment of three TDD large-bandwidth carriers with aggregation promises to provide users with an unmatched network experience.

An Era of Innovation, Bolstered by 5G Saleem Alblooshi, Chief Technology Officer at du, said, "Introducing 5G three carrier aggregation in our In-Building Solution (IBS) network is a crucial step in ensuring a leading 5G user experience. It has enabled us to enhance our network's capabilities and quality, greatly improving customer satisfaction."

Eric Bao, President of Huawei's Wireless Digital Indoor System Product Line, commented, "As an industry-leading indoor solution, LampSite X assists operators in building indoor networks that offer both intelligence and exceptional performance to meet the explosive growth in service demand."

Netcracker's New Broadband Solutions for CSPs

Netcracker Technology has launched a suite of Broadband Experience Solutions to help telecom service providers quickly expand into new growth markets, including the MVNO and B2B sectors.

The pre-packaged, cloud-native solutions will accelerate the build-out of advanced fiber and mobile connectivity, transforming the customer experience with digital and AI technology, and expanding growth in B2B markets. The solutions are built on the most advanced security framework in the industry, instilling providers and their customers with confidence in their new service offerings.

"We are seeing our cable and broadband customers face numerous market challenges, which have made it essential for them to modernize their infrastructure, expand into areas such as mobile and fixed-mobile convergence and reduce churn and add subscribers," said Bob Titus, CTO at Netcracker. "Our Broadband Experience Solutions gives MSOs (operators) more options, as well as the support to enter new markets quickly, differentiate their offerings and deliver a superior customer experience that will give them a competitive edge."

Pre-Packaged Offerings
Telecom service providers have a significant opportunity to grow and innovate their businesses with a multi-broadband access strategy delivering powerful differentiated offers, rapid time-to-market and a premium customer experience. Central to their success will be new levels of business agility designed to launch personalized offers in minutes, convergence across all lines of business to increase competitiveness, a digital-first approach for customers to easily purchase and get the support they need, and increased cost efficiency by adopting lean and automated solutions that scale as the business grows.

Netcracker's Broadband Experience Solutions deliver on these challenging requirements through pre-packaged offerings designed to accelerate expansion into new markets and help boost loyalty and growth in existing ones. These solutions include MVNO Cloud Solution, Fiber Cloud Solution, B2B Solution, GenAI/Data Analytics Solution, and Digital Experience Solution.

Nokia EDA: Powering AI-Driven Data Center Networks

In an effort to reduce human error in network operations to zero, Nokia's new Event-Driven Automation (EDA) platform reduces network disruptions and application downtime while also decreasing operational effort by up to 40%.

EDA is available on-premises and on cloud-based "as-a-service" subscription models. Through the EDA app store, which leverages a cloud-inspired approach, operators can easily customize their automation environment.

By breaking down the barriers organizations face in the migration to data center automation, EDA is ushering in a new era of highly reliable, simplified, and adaptable lifecycle management, thus, ensuring that data center networks are designed for an AI world.

Increasing Automation in Cloud and Networking Operations

Ongoing digital transformation and the rise of AI applications, coupled with data center workforce shortages and skills gaps, are driving webscalers, enterprises, and service providers to scale and adapt their data center infrastructures to meet exponential demand and evolving workload requirements.

As more critical workloads move to the cloud, interruptions in cloud services can have significant economic, safety and social implications. Thus, increasing automation in cloud and networking operations is essential to respond to demand while reducing service disruptions.

Despite the benefits of network automation, barriers to adopting automation include a lack of scalable, open, multi-vendor solutions; legacy systems and their complexity, requiring skilled resources; and a lack of trust in fully automated systems delivering the right outcomes.

Nokia's new infrastructure automation platform is designed to overcome these barriers while providing a new path to addressing key challenges in today's data center network environment.

Benefits of Nokia's EDA

The risk of human error and associated network downtime is mitigated through EDA's integrated digital twin, pre- and post-deployment checkpoints, highly responsive multi-dimensional observability, and a robust CI/CD methodology with revision control.

Moreover, simplicity in operations is enabled through intent-based declarative automation, GenAI assistance and a low-code/no-code approach to building customized dashboards.

Ericsson Launches Enterprise 5G Strategy

Swedish telecommunications company, Ericsson, recently launched its Enterprise 5G strategy, aiming to provide enhanced connectivity in operational and public-facing enterprises.

By leveraging private 5G and neutral host 5G solutions, the strategy allows carpeted and industrial enterprises to accelerate innovation, safety, and operational efficiencies.

Manish Tiwari, Ericsson's Head of Private Cellular Networks, Enterprise Wireless Solutions, underscored, "As enterprises continue to increase automation, improve safety, and invest in seamless connectivity to meet end-user expectations, existing technologies such as Wi-Fi and Distributed Antenna Systems (DAS) often fall short due to technical limitations, cost, and complexity."

Furthermore, Tiwari highlighted that the Enterprise 5G Portfolio addresses requirements by leveraging Ericsson's best-in-class radio, software, and managed operations capabilities to enable flexible enterprise solutions.
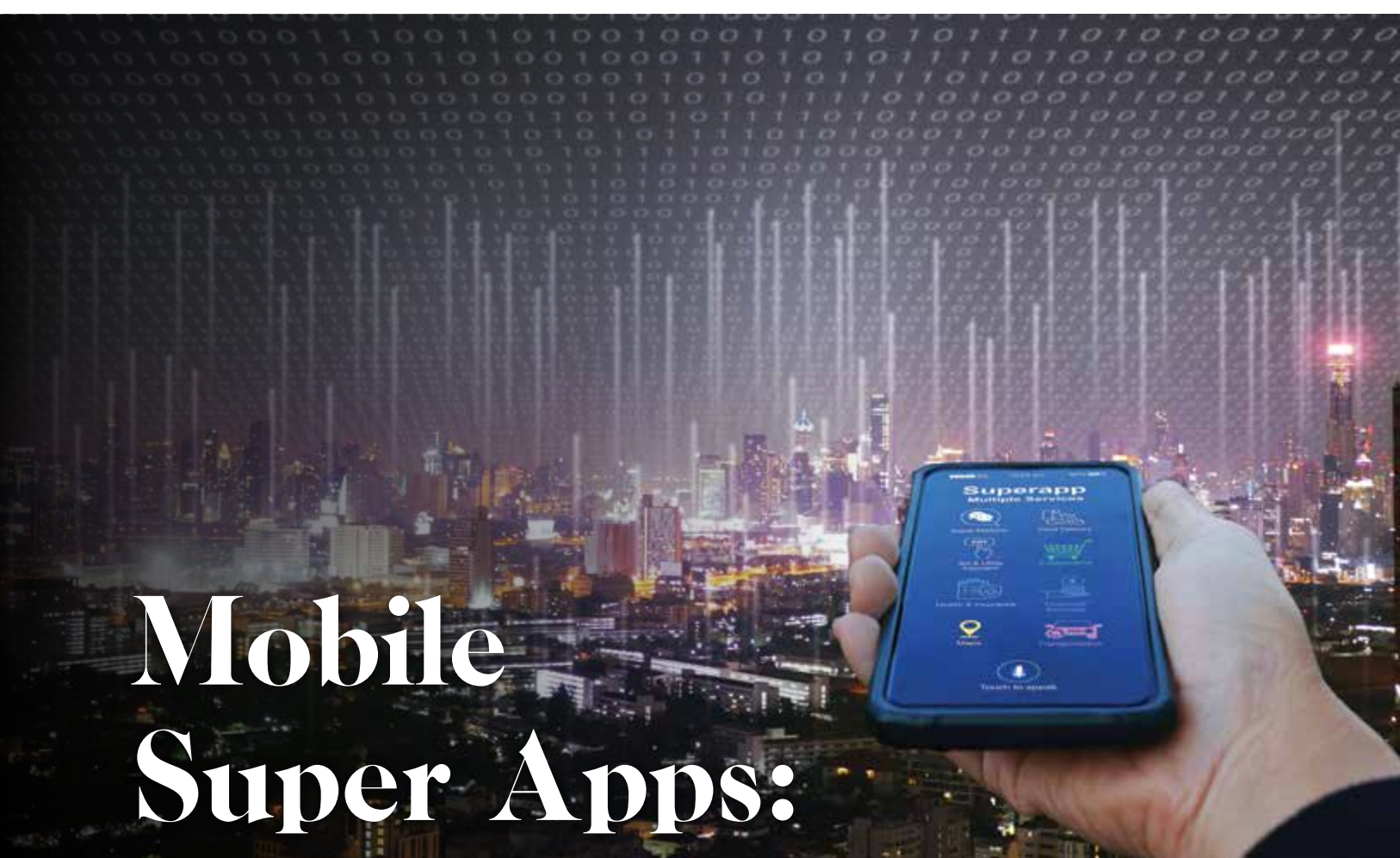
Enterprise 5G Portfolio Solutions

The following innovative solutions comprise Ericsson's latest Enterprise 5G Portfolio:

- **Ericsson Private 5G:** A converged 4G/5G private cellular solution with industry and licensed spectrum support, offering flexible deployment models and best-in-class coverage, mobility, security, and latency.

- **Ericsson Private 5G Compact:** A U.S. CBRS-based offering designed for enterprises that need robust connectivity in environments where Wi-Fi falls short, leveraging a simplified radio architecture (previously branded as Cradlepoint NetCloud Private Networks).

- **Ericsson Enterprise 5G Coverage:** A best-in-class neutral host solution, currently certified by all major U.S. carriers, that offers a simplified and scalable architecture compared to legacy DAS, resulting in attractive total cost of ownership (TCO) for enterprises.

The project utilizes the Ericsson radio access network (RAN) portfolio, featuring the Radio Dot System for indoor deployments and small cell radios for outdoor use. By adopting simplified subscription-based packaging with optional services and feature add-ons, acquisition costs are minimized.

Mobile Super Apps:

Gateways to the Digital World

Mobile apps have facilitated ubiquitous access to the digital world. From ordering food to making cross-border payments, it is safe to say that this digital interface has become society's "online lifeline."

The global mobile application market develops and distributes mobile apps to run various applications on mobile operating systems such as Android OS, Apple iOS, Harmony OS, etc. The most popular built-in mobile app marketplaces—Apple and Google Play—house millions of apps that can be downloaded to one's smartphone.

Moreover, ongoing technological advancements, such as faster processors, improved connectivity and the continued increased penetration of smartphones in developing countries has bolstered the growth of the mobile application market.

For example, the recently announced AWS App Studio—a GenAI-powered service—claims to use natural language to create enterprise-grade applications that can be built in minutes as opposed

to days. Hence, the pace of mobile app creation is dizzying, to say the least.

The Age of Super Apps
The efficiency of mobile apps to access services has led to the growth of super apps—an application with a set of core features plus access to independently created mini apps that users can choose from to activate consistent and personalized app experiences. The beauty of a super app is that users can move seamlessly between functions,

sharing information and data between its different parts.

The concept of a super app is proving to be advantageous for today's telcos as they seek to find new avenues for revenue growth other than their traditional services. Moreover, the convenience of cloud services offers them the opportunity to phase out legacy IT systems and migrate to a single platform-based model that facilitates better services as well as revenue growth.

The ergonomic idea is to a create a single digital location through a super app that offers a wide array of products and services from operators and third parties to users on-demand, ranging from service apps, gaming, tech products, utility bill payments, and so on.

For example, China's WeChat is a super app that incorporates instant messaging, social media, payment, mini-programs, language translations, and business-oriented services into one simple platform. It is used by approximately 1.32 billion monthly active users, covering 80% of China's total population.

Conversely, in other parts of the world, such an app hasn't been introduced yet as apps in Western countries and other geographies are largely restricted from tracking the mobile activity of its users. U.S. tech companies have attempted creating super apps, but they have had to contend against thousands of other apps offering similar interfaces as well as dynamic consumer behavior.

In the past, when companies like Meta (formerly Facebook) tried to launch singular apps, consumers largely rejected them. Currently, a lot of people distrust big tech companies and the idea of a single tech company like Meta, Amazon, or Google offering an app that houses so many different facets from online payments, to bill management, to health records is unsettling to some people.

Demand for a 'One-Stop Shop'
Global consulting agency, Deloitte,

predicts that "the next evolution in digital activity, however, may not be in the form of a patchwork of discrete apps, but rather a single one-stop-shop experience."

In line with this trend, leading telecom operators in the UAE have launched their version of a super app. For instance, in 2023, e& successfully acquired 50.03% of Careem Technologies (notably known for launching the Careem 'everything app') for a whopping USD 400 million as part of the group's growth strategy.

By tapping into Careem's established network and expertise, e& could explore diverse markets and meet the evolving needs of its consumers. It also allowed e& to tap into multiple digital services, access talented professionals, and expand its reach across different geographies.

Similarly, du, one of the leading telecom operators in the UAE, introduced du Pay, a versatile platform designed to streamline payments, transfers, and financial management. With an impressive USD 39.7 billion in outward international money transfer volumes from the UAE, du Pay is positioned to tap into this extensive market by providing services that prioritize simplicity, security and a customer-centric experience.

The Battle Hindering the Rise of Super Apps
Operating globally calls for dealing with cross-border legal complexities encompassing data privacy, content sharing, and surveillance. Companies must navigate these legal landscapes to avoid violations. In recent news, Meta was fined USD 220 million by a Nigerian antitrust agency for violating data and privacy laws by sharing WhatsApp user information with its Facebook subsidiary and third parties without consent.

Given the world's inevitable journey towards an all-digital ecosystem, super apps with security in their DNA can be utilized as multi-faceted tools to enhance the industries of the future. However, regulation must remain at the forefront.

Global regulatory authorities must collaborate to evaluate the legitimacy, fairness, and necessity of data processing, considering its impact on individual rights and interests and the associated security risks. Due to the heightened privacy risks involved in disclosing, transferring, or sharing personal information between different data processors, extra safeguards are needed. These include strengthened personal control over data and greater accountability from those handling the data.

Once this mechanism is established, the opportunities offered by the digital economy can be harnessed seamlessly among the participating entities through this single interface model. For telecom operators, this presents an opportunity to market their mobile and broadband offerings to a diverse set of audiences, expand their reach across borders and ultimately run profitable operations. **TR**

> "The concept of a super app is proving to be advantageous for today's telcos as they seek to find new avenues for revenue growth other than their traditional services

UK 5G Availability Falls to 10%, New Report Reveals

A recent report from Opensignal highlighted a decline in 5G availability across the UK compared to the same period last year. The data shows that UK smartphone users only have access to 5G networks an estimated 10% of the time. This metric is considered more indicative of user experience than mere coverage statistics.

While overall network availability for 3G, 4G, and 5G remains high—above 95% for all operators—Vodafone appears to be struggling against its competitors. The telecom giant did not secure any category wins in Opensignal's experience analysis, however, it ranked second in several categories, including three of the four overall experience metrics.

Leading the pack, EE reported a 13.2% availability rate for 5G, while O2 lagged behind at 8.3%. A year ago, 5G availability ranged between 10% and 10.6% for the major operators, showing a slight increase for EE, which continues to dominate the experience market.

The report emphasized EE's strong performance, as it outperformed rivals in ten of the fourteen categories assessed, including overall speed and video experience.

Three UK also maintained a solid performance, particularly in 5G upload and download speeds, while O2 secured the top position for geographical coverage experience.

Opensignal's report noted that Vodafone's upcoming merger with Three could reshape the competitive landscape, potentially boosting their combined coverage experience to rival that of O2. The Competition and Markets Authority is expected to deliver a decision on this merger in December.

Latin America and the Caribbean Evolve in Cybersecurity Implementation: ITU

Most countries in Latin America and the Caribbean are in the evolving phase of the International Telecommunication Union's (ITU) 2024 Global Cybersecurity Index. The UN agency's index analyzed 194 countries, dividing them into five levels: Building, Evolving, Establishing, Advancing, and Role Modelling.

According to this indicator, the countries in the region that are "Evolving" are: Argentina, Bahamas, Barbados, Belize, Bolivia, Dominica, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Nicaragua, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Venezuela.

Following these are the countries in the "Establishing" phase: Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Jamaica, Panama, Paraguay, Peru, and Trinidad and Tobago.

The nations in the "Advancing" status are Ecuador, Mexico, and Uruguay, while the only country in the region that qualified as a Role Model is Brazil.

Since 2021, on average, countries have taken more actions and made improvements in their cybersecurity commitments, raising the global average to 65.7 points out of 100, the document highlights.

"The 2024 Global Cybersecurity Index shows significant improvements in countries implementing essential legal measures, plans, capacity-building initiatives, and cooperation frameworks, especially in strengthening incident response capabilities," said Cosmas Luckyson Zavazava, Director of the ITU Telecommunication Development Bureau.

The Index highlights that last year, 8 billion records were breached as part of 2,800 reported violations, meaning the average cost of a data breach increased by 15 percent over the past three years.

"These incidents can be costly; for small businesses in North America alone, the average breach is estimated to cost $3.3 million," the report details.

Countries also risk losing user trust in Information and Communication Technologies (ICT) due to these data breaches.

Tunisie Telecom, Orange, Ooredoo Compete for 5G Licences in Tunisia

Tunisia's leading mobile operators—Tunisie Telecom, Orange Tunisie, and Ooredoo Tunisia—have officially submitted their applications for 5G licenses, with approvals expected in the next three weeks.

The Ministry of Communication Technologies has established a technical committee to review each applicant's technical capabilities and financials before granting licenses. Each 15-year license will provide 5 MHz of spectrum in the 700-MHz band and 100 MHz in the 3.5 GHz band for 5G usage, with additional 20 MHz blocks available upon request.

Further 5G frequency bands will be introduced in later phases.

The ministry initiated the 5G tender process in June, aiming to launch commercial 5G services by November. While Tunisian operators like Ooredoo have already upgraded their networks for 5G readiness, widespread adoption may be gradual. A significant challenge lies in device compatibility: although Tunisia has over 9 million smartphone users (73% of the mobile market), only 652,000 devices are 5G-compatible, potentially limiting the initial uptake of 5G services.

By 2025, A Global Telecom Consortium Will Scale Network APIs

The world's largest telecom players are uniting for a new venture that will combine and sell network Application Programming Interfaces (APIs) on a global scale to spur innovation in digital services.

The newly formed company consisting of América Móvil, AT&T, Bharti Airtel, Deutsche Telekom, Orange, Reliance Jio, Singtel, Telefónica, Telstra, T-Mobile, Verizon, Vodafone, and Ericsson, will combine network APIs globally to ensure that new applications can work anywhere and on any network, making it easier and quicker for developers to innovate.

Network APIs are the way to easily access, use and pay for network capabilities, and this global venture will drive implementation and access to common APIs from multiple telecom service providers to a broader ecosystem of developer platforms, including hyperscalers (HCPs), Communications Platform as a Service (CPaaS) providers, System Integrators (SIs) and Independent Software Vendors (ISVs), based on existing industry-wide CAMARA APIs (the open-source project driven by the GSMA and the Linux Foundation).

The transaction's completion is expected by early 2025, subject to regulatory approvals and other customary conditions, with Ericsson set to hold 50% of the equity in the venture while the telecom providers will hold 50% in total.

Ericsson President and CEO, Börje Ekholm, stated, "A global platform built on Ericsson's deep technical capabilities—and with a comprehensive ecosystem that provides millions of developers with a single connection—will enable the telecom industry to invest deeper into the network API opportunity, driving growth and innovation for everyone."

Additional telecom operators are encouraged to join the new company, further driving the industry and developer experience forward, and allowing all participants to tap into a significant new revenue opportunity. Three Sweden (Hi3G Access) is already in discussions.

The new venture shareholders will bring funding and important assets, including Ericsson's platform and network expertise, global telecom operator relationships, knowledge of the developer community and each telecom operator's network APIs, expertise and marketing.

Nigeria Embraces 6GHz Band for Wi-Fi 6 to Drive Technological Growth

Nigeria is making a major stride in digital connectivity by adopting the 6GHz band for Wi-Fi 6 applications. Dr. Aminu Maida, Executive Vice Chairman and CEO of the Nigerian Communications Commission (NCC), announced this during a recent Stakeholders' Consultative Forum on Emerging Technologies.

This move is expected to boost internet speed and reliability nationwide, bringing Nigeria in line with global telecom advancements. Wi-Fi 6, renowned for managing multiple devices and delivering faster data rates, is increasingly essential in today's digital world, where high-speed internet is crucial for both personal and professional use.

Dr. Maida highlighted the significance of this development in driving technological innovation and expanding access to digital services across Nigeria. By increasing the available spectrum for wireless communication, the NCC seeks to create an environment that supports economic growth and digital transformation.

India's Homegrown 4G Technology Set for 2025 Launch, Union Minister Reveals

Union Minister, Jyotiraditya Scindia, has announced that India's indigenous 4G technology stack is scheduled to launch by mid-2025.

Speaking at the 51st AIMA National Management Convention, the Minister of Communications highlighted this milestone as part of three major targets for the country and its government.

India's 4G Technology Stack "India, for the first time in her existence, has developed her own 4G technology stack that will be rolled out by the middle of next year," he said.

Scindia emphasized the importance of not just implementing technology but also focusing on designing and developing homegrown innovations.

He mentioned that the government has set three key targets, with the first being to achieve digital saturation across the country. The aim is for every area to be connected and for every individual to access opportunities through the digital revolution.

Scindia noted that India has already established nearly 450,000 towers nationwide and announced plans to deploy an additional 20,000 towers, supported by an investment of INR 44,000 crore. "By mid FY-25, we will have committed and completed 100% saturation in our country," he said.

Indosat, Accenture Launch Indonesia's First Sovereign AI Cloud Platform

Indosat Ooredoo Hutchison (Indosat), in partnership with Accenture, is working on accelerating the development of an AI cloud platform in Indonesia. This collaboration aims to drive digital transformation by providing cutting-edge AI solutions tailored for different industries while ensuring data governance.

The focus initially will be on AI solutions for Indonesia's financial services sector, a key part of the country's economy. Accenture will offer pre-built solutions through their AI Refinery platform to help Indonesian banks harness AI for profitability, efficiency, and growth in a competitive market.

AI for Growth and Innovation

Vikram Sinha, President Director and CEO of Indosat, emphasized the company's commitment to supporting Indonesia's vision for digital empowerment. The collaboration with Accenture and Lintasarta aims to combine global expertise with local insights to help businesses in Indonesia leverage AI for growth and innovation.

Senthil Ramani, Senior Managing Director at Accenture, highlighted the importance of supporting Indonesian enterprises in unlocking value from AI while complying with regulations and data security measures. This collaboration is a step towards AI sovereignty and helping Indonesian businesses redefine their future through AI-driven reinvention. Lintasarta and Accenture's collaboration aims to empower Indonesia's digital transformation by developing the country's first sovereign AI platform.

Canada's Telecom Giants Turn to Asset Sales as 5G Demands Intensify

Industry experts foresees that Canada's telecom sector currently faces challenges like slower growth and intense competition, prompting leading companies to consider selling assets as a strategy to cut costs.

Despite that, the investment potential of the sector remains and asset managers anticipate a turnaround once some of the uncertainties are laid to rest in the near-to-medium term.

Canadian Telcos Adapt to Competitive Environment

According to analysts, Canada's "Big 3" telecom companies—Rogers, Bell Canada, and Telus—along with Quebecor Inc. and Cogeco, have opportunities to explore various divestiture strategies.

This is due to the fact that the Canadian telecom landscape has grown increasingly competitive, with price wars slowing revenue growth and pushing companies toward restructuring.

"In this type of environment, we believe telecom providers are seeking efficiencies, with divestitures on the radar as leverage remains elevated and interest rates continue to fluctuate," noted CIBC analyst Stephanie Price in a research report.

In recent years, telecom companies have taken on significant debt to develop their 5G networks, aiming to offer faster speeds and more reliable connections. At the same time, Bell and Telus have been aggressively expanding their fiber internet networks across Canada.

Denmark's Strategy for Nationwide High-Speed Broadband by 2025

Denmark is welcoming digital transformation with its ambitious broadband strategy, aiming to provide all households and businesses with robust internet connectivity by 2025.

Denmark's broadband strategy, established in 2021, aims to achieve three key goals: provide all households and businesses with a minimum of 100 Mbps download and 30 Mbps upload speeds by 2025, ensure 98% have access to 1 Gbps download speeds by 2025, and assess the demand for gigabit speeds by 2030.

Denmark's core focus of its broadband strategy is its commitment to comprehensive coverage. Established in 2021, this framework not only aims to achieve high-speed connections but also addresses broader societal challenges. The Digital Strategies for 2022-2025 and 2024-2027 highlight initiatives that tackle workforce shortages, climate change, digital inclusion, and the integration of artificial intelligence (AI) into everyday life. These strategies are crucial for ensuring that all citizens can benefit from digital advancements.

Key governmental bodies play a vital role in the implementation and regulation of this broadband initiative. The Ministry of Climate, Energy, and Utilities oversees policy development, working closely with the Danish Agency for Data Supply and Infrastructure (SDFI) and the Danish Energy Agency, which regulates telecommunications and energy supply. Together, these authorities create a regulatory framework that facilitates broadband growth while ensuring that the needs of the population are met.

Mapping Coverage, Financing Growth, and Fostering Digital Skills for a Connected Future

Broadband mapping is another significant measure within this strategy. The Danish Energy Agency has developed an interactive tool, Tjekditnet, that allows residents to check available speeds and providers at their specific addresses. This mapping effort is essential for identifying gaps in coverage and ensuring that resources are allocated efficiently, particularly in rural areas where market-driven solutions may be insufficient.

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