5G-Advanced
Is the Future of Communication

CPaaS for Modern Businesses: Unifying Channels, Amplifying Impact

Telecom Industry's Trinity: Spectrum, Space and Sustainability

How Cloud Technologies Can Help Low-Carbon Industries

SUMMIT
TELECOM Review
LEADERS' SUMMIT
17th Edition

JOIN

THE MOST INFLUENTIAL

VIP ICT GATHERING

"GLOBAL. REGIONAL. DIGITAL."

06-07 DECEMBER 2023

Le Meridien Dubai Hotel & Conference Centre, Great Ballroom

telecomreview.com/summit

TELECOM Review

THE TELECOMS INDUSTRY MEDIA PLATFORM

telecomreview.com

From iPhones to EVs: Foxconn's Bold Move Amid US-China Tensions

Foxconn Chairman and CEO Young Liu unveiled the company's ambitious blueprint to broaden its electric vehicle (EV) enterprise. This move could serve as a contingency plan for the iPhone manufacturer as escalating tensions between the US and China impact its main revenue stream.

READ MORE

Grants to Be Awarded for AI Management Insights

OpenAI, the creator of the popular artificial intelligence chatbot ChatGPT, has said that it will distribute 10 equal grants from a $1 million fund earmarked for studies in democratic processes to explore how AI software can best address biases and other concerns.

READ MORE

iOS 17 Introduces New Features for a Better Visual Experience

The new Apple iOS 17 operating system for iPhones brings some aesthetic changes, including the ability to keep posters for calls, live voicemail, live stickers and more. It also adds some useful privacy and security features, such as NameDrop and Check In.

READ MORE

The Beginning of the End for Metaverse?

After seven years of hard work developing its latest jewel of a product, Silicon Valley superstar Apple has introduced its irresistibly sleek mixed-reality headset that could throw cold water on the "metaverse" dream propagated by rival Meta.

READ MORE

Readying for New and Exciting 'Palm Payment' Tech

Palm payment has arrived, revolutionizing the way we pay. Experience the future of payments with biometric data and WeChat Pay integration.

READ MORE
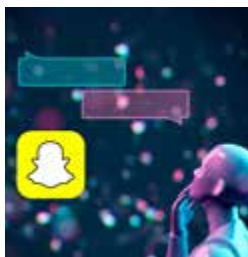
Snapchat's New AI Chatbot Feature Is Facing Backlash From App Users

The notable new chatbot feature from Snapchat is powered by ChatGPT, but with some key differences: users can customize the chatbot's name, design a compatible custom Bitmoji avatar and feature it in conversations with friends, the latter of which is raising concerns among teens and parents alike.

READ MORE

5G-Advanced Is the Future of Communication

The demand for global connectivity solutions by enterprise and wholesale users has amplified the need for robust and agile telecom networks to support and empower a country's drive toward digital transformation and economic growth. 5G has seen its large-scale application globally in over 17,000 private line projects serving multiple sectors like manufacturing, port, mining, oil & gas and healthcare and delivering significant economic benefits throughout society. Moreover, industrial digitalization is positioned as the driver for a digital, intelligent economy.

Although we have already embarked on the 5G era, some legacy networks are still serving the needs of connectivity in some parts of the world. However, the inevitable adoption of 5G-powered applications will compel the phasing out of such networks sooner than anticipated. For instance, the UK is expected to discontinue all of its public 3G mobile networks by 2033 to facilitate the mass rollout of 5G. Similarly, in the UAE, the Telecommunications and Digital Government Regulatory Authority (TDRA) has set an ambitious objective of 100% 5G penetration in the country by 2025.

Moreover, 5G New Radio (NR) and 5G Core (5GC) evolution is continuing in 3GPP toward 5G-Advanced (5G-A) also known as 5.5G. This will ensure the success of 5G systems globally and expand the usage of 3GPP technology by supporting different use cases and verticals. The industry waits in anticipation for Release 18 in 2024, which will be dedicated to 5G standardization.

Connecting Everything
The vast network of interconnectivity enabled by Internet of Things (IoT) technology is gaining momentum. It is a catalyst for enhancing AI and ML capabilities, data analysis in real-time, industrial solutions, advanced security, edge computing, centralized connectivity, data management, etc., collectively enabling more efficient operations. This capability of the technology, which accelerated during 2020 amidst the COVID pandemic when remote interactions took precedence as a preferred way to keep safe and secure, has carried on with more vigor and gusto. As the digital ecosystem continues to evolve, more connected devices and the IoT will see greater demand for continuous innovation to build next-generation capabilities.

From immersive extended reality (XR) experiences to high-precision location, presence and timing technologies, 5G-Advanced is projected to transform what telecom networks can achieve. The combination of AI/ML data collection and analytics, coupled with the introduction of AI/ML technologies in CORE, RAN and network management, is expected to bring many benefits and new levels of interoperability.

"For mobile broadband communication, it (5GA) promises to bring about unprecedented growth opportunities and enable new service scenarios, applications and business models. One of the significant advantages of 5.5G is its ability to upgrade network capabilities by 10X and support a 10 Gbps experience, enabling 100 billion connections and native intelligence for numerous services," says Huawei's An Jian, the president of Carrier Network Business Group, Huawei Middle East and Central Asia.

Here in the Middle East, the UAE has adopted the technologies of the Fourth Industrial Revolution (4IR), such as 3D printing, artificial intelligence (AI), big data and robotics, for its industrial sector, most notably the aviation

The inevitable adoption of 5G-powered applications will compel the phasing out of legacy networks sooner than anticipated

> 5G-Advanced also known as 5.5G is projected to transform what telecom networks can achieve

industry, making it a worldwide hub. The connectivity and ultra-low latency afforded by the 5GA are needed to propel sectors such as aviation and manufacturing, which are critical for positioning the UAE in the leading global arena. For instance, with improvements in industrial connectivity, regional aviation company Sanad Aviation Technologies was able to clinch a deal worth AED23.87 billion with Rolls Royce on the sidelines of the recently concluded Paris Air Show, reflecting the potential of tripling output in manufacturing aviation engines. Such remarkable achievements will require the support of solid connectivity along with the energy conservation capabilities that 5GA technology will provide.

Global Players at Work
Perhaps the most enthusiastic proponent of the 5GA has been the leading ICT equipment maker Huawei, among others.

At a recent event in Beijing, Huawei launched a 5G-Advanced Core promotion initiative alongside industry partners, including the China Academy of Information and Communications Technology (CAICT), 3GPP, China Mobile, China Telecom, China Unicom and others. The group will pool its resources to promote industry consensus and commercial deployment of new core architecture in the 5G-Advanced era. They will also work on building an intelligent, convergent core network to connect everything and enable all services, helping implement the industry's vision of an intelligent world.

To fully benefit from the value of 5G and better transition towards 6G, Huawei took the industry lead in putting forward the concept of 5.5G. In 2021, 3GPP officially designated 5G-Advanced as the second phase of 5G evolution, starting to standardize its components in Release 18. This latest package of 3GPP mobile standards marked a new chapter in the development of 5G technologies and standards around the world. As the engine of telecom networks, the 5G-Advanced Core will drive all service scenarios with comprehensively enhanced network connectivity.

New service requirements for 5G-Advanced, such as facilitating people's expectations of videos shifting from 2D to 3D, call for enhanced connections that allow seamless transition from voice and video to intelligent interactions. These requirements stimulate the growth of new scenarios, content, and applications. To address all of these, the 5G-Advanced Core's network capabilities will need to be comprehensively strengthened, especially in terms of adaptive multi-mode connections and fully meshed networking. With intelligent management of topologies, experiences, and services, the 5G-Advanced Core will enable new video, new connectivity, and new calling services, taking service experiences to new heights and fueling the digital transformation of numerous industries.

For wireless 5.5G development, it is essential to have the right spectrum strategy. The U6 GHz spectrum is seen as a valuable asset for 5.5G, and the International Telecommunications Union (ITU) WRC-23, taking place in October and November in Dubai this year, will play a key role in determining its use for wireless communication. Operators should work with regulators and industry organizations to ensure that U6 GHz is designated as a wireless communication spectrum, which will enable its use for 5.5G and other future wireless technologies. This will require broad support from stakeholders and may involve negotiating with other parties that may also be interested in using the spectrum.

In addition to U6 GHz, mmWave is another spectrum that is being considered for 5.5G. This high-frequency band has the potential to provide ultra-high data rates but also requires significant infrastructure investments due to its limited coverage range. Operators should evaluate the potential benefits and challenges of using mmWave for 5.5G and plan their network strategies accordingly.

Recently, Nokia announced the launch of an enhanced portfolio of next-generation RAN solutions, which they

> One of the significant advantages of 5.5G is its ability to upgrade network capabilities by 10X

claim deliver twice the performance with 50% energy use, helping customers meet their ESG targets. The future-ready AirScale baseband portfolio supports ultra-high capacity to handle exponential increases in traffic growth. Meanwhile, its MantaRay solutions portfolio helps customers leverage the power of artificial intelligence in their mobile networks, supporting the long-term network evolution to 5G-Advanced and beyond.

How Can Operators Monetize 5G-Advanced?
While 5G has been instrumental in enabling new service scenarios, applications and business models and has paved the way for unprecedented growth opportunities, there are growing demands to cater to new consumer and industry digital transformation needs. The evolution towards 5.5G or beyond is likely to bring more advanced capabilities, higher speeds and greater connectivity to support the growing number of connected devices and emerging applications. Below are some considerations that warrant closer observation.

Ubiquitous Gaming: Mobile XR and cloud gaming both need short set-up times and power efficiency to be available anywhere, anytime, on compact devices with small batteries.

Industrial Operations: Autonomous operations, including autonomous vehicles, robots and drones, as well as monitoring and quality control, demand the frequent and efficient transmission of small data packets to support network performance.

Asset Tracking: 5G-connected tags for asset tracking require minimum energy consumption and ultra-low latency.

Indoor and Outdoor Positioning: New capabilities such as carrier-phased positioning to locate connected devices can improve the accuracy of wireless cellular networks with centimeter-level accuracy.

Real-Time Financial Transactions: Contactless payment has been at the core of digital finance. 5GA connectivity delivers the security and agility needed for such crucial activities.

Wearable Devices: It is estimated that there will soon be over 100 billion IoT connections around the world, making three major technologies vital: RedCap, NB-IoT and Passive IoT that will be connected to personal devices.

Urban Mobility: Both ultra-high-speed trains and autonomous public transport will require next-generation signaling and communications systems that are connected to smart grids for maximally efficient operations.

How Can Network Operators Approach 5GA?
Network operators must be the enablers for people and businesses to reap the benefits of the latest technology, whatever that may be. "The move towards the 5.5G era will be a collaborative effort of industry players to create a better, intelligent world together. It promises to unlock new opportunities for growth and innovation across various industries," reiterates Huawei's An Jian. When it comes to 5G-Advanced, operators have to exercise stringent revenue

and cash-flow management through proper strategies put in place through the following:

Focus on Innovation: Investment in the latest software, hardware and talents, along with digital-age management practices, can help mobile operators achieve breakthrough cost savings and capital intensity while maintaining or even increasing their scale. Managing networks with next-generation technologies can cut the capital spending and operating expenses of wireless operators. Digitalization can support the streamlining of business functions and customer service operations. Upgrading the platforms and network elements that do not support the full capabilities of the existing technologies should remain a constant feature.

Leverage Data: Advanced analytics can help mobile operators determine which capital investments will benefit their network operations the most. Operators can look through ample data about where, when and how much subscribers' behaviors and device use patterns change in less time. This practice will ultimately result in better subscriber retention management.

Enhance Industry Collaboration: Collaboratively developing know-how and best practices for upcoming technologies through multi-vendor interoperability of service providers, transport network solutions, etc. Testing and validation of various integration points between IT and network systems for new technology-based changes are key.

Looking Towards 6G
Judging by the principles of technological shifts, even the current transformation taking place will start to face challenges beyond the capacities of 5G and 5G-Advanced (5G&B). Industry players are already talking about 6G technologies to provide an efficient, human-friendly and sustainable society through ever-present intelligent communication. In the era of the "network of sensing," 6G wireless communications will become

the mainstay for running huge bitrates (terabits per second) with less than 1 ms latency, connecting people to many possibilities. Along with AI and AR/VR, many future data-intensive applications and services are expected to demand a higher data rate (+1 Tbps) and an extremely low delay (0.1 ms). These will include pervasive edge intelligence, high-precision manufacturing, holographic rendering, ultra-massive machine-type communications and MR-based gaming. Furthermore, deployment of Internet Protocol version 6 (IPv6) is already underway in different parts of the world as the IP address space in the current version, IPv4, begins to narrow rapidly as more connected devices are linked to the digital grid. Until humanity arrives at that point in time, 5G-Advanced promises unimaginable opportunities for both enterprise and consumer segments. Such achievements, however, will require the constant fostering of industry partnerships to maximize the systematic and reliable 5G capabilities that are essential for the increasingly intelligent world that we live in. ⟦TR⟧

> 5G-Advanced promises unimaginable opportunities for both enterprise and consumer segments

Dalia Nabil, Head of Presales, Business Applications, MEA, Nokia

Nokia Helps CSPs Create Value in a Connected World Through AIOps

Nokia is a leader in the real-world application of AI and ML. In an exclusive interview, Dalia Nabil, head of presales, business applications, MEA, Nokia, discusses the importance of deploying automation and AI, Nokia's orchestration portfolio and the benefit of the company's AI Ops approach for CSPs, among other insights.

Why do CSPs need to adopt a new approach to network and service operations?

The 5G era requires a new operation paradigm — one that is underpinned by network slicing, automation and AI, and where we connect the network to the business so that operations are truly driven by business intent.

The new approach is mainly driven by two factors: increased technological complexity and new business dimensions.

Networks that have been created over time have always been complex. These are layers of new and old multi-vendor technologies that must coexist and be managed by an ever-decreasing number of operations engineers. We are already at the limits of human abilities, and 5G will bring a raft of new technologies and new complexities that will push us over the edge.

5G also brings a new set of business dimensions. These dimensions include a huge variety of use cases as well as new B2X business models and an evolving ecosystem of partners and enterprise customers.

Additionally, as hyperscalers push further into the telecom space, there's more urgency than ever for CSPs to strengthen their value proposition in the expanding digital ecosystem.

To address these challenges and unlock their networks' actual value, CSPs need trusted partners that can guarantee intelligent, secure operations to simplify network complexity and monetize 5G services. Deploying automation and AI to respond to business intent will be foundational to each of these goals.

According to the TMForum, up to 72% of CSP revenue growth associated with 5G is dependent on the evolution of operational and business support systems.

What are the newly developed use cases for customers, enterprises and consumers with regard to autonomous operations? How does Nokia enable these?
Autonomous networks aim to define

fully automated, zero-wait, zero-touch, zero-trouble and innovative network services. They support self-configuration, self-healing, self-optimizing and self-evolving telecoms network infrastructures for telecoms internal users.

One of the key 5G use cases is network slicing, which is equipment-vendor agnostic and can span across a radio network from vendor one, to the core of another. CSPs can define the specific characteristics of a slice, including speed, latency, reliability and security.

Nokia's award-winning Digital Operations Center is a modular solution comprised of an Orchestration Center, an Assurance Center and a common Unified Inventory.

Nokia's orchestration portfolio addresses a diverse universe of use cases, services, business models and technologies for monetization of "business-centric use cases." including but not limited to the design and delivery of 5G slices, intent-driven service orchestration, Bandwidth on Demand and overlay service orchestration services, e.g., SD-WAN, Domain service enabler for NaaS.

Nokia's assurance portfolio addresses a diverse universe of AIOps use cases, technologies and ML-based automations at the network and service level that simplify operations and increase business agility and operations efficiency through predictive key performance indicators, anomaly detection and closed-loop intelligent automation.

Enabling the world of "Anything, Anywhere and Anytime," could you please tell us more about the Hexa-X project and other initiatives related to Nokia's 5G/5G A/6G vision?
Hexa-X is a 25-member consortium with players from adjacent industries and academia. Nokia has the overall lead role. The project primarily captured the aspirations that European businesses, academia and other organizations had for the 6G network, as well as identifying the kinds of technologies that would be needed to realize the vision. The Hexa-X project envisioned that 6G would be a key societal platform for building

efficient and sustainable ways of living, ensuring trust, security and privacy, and creating economic prosperity and growth.

Another Nokia initiative is 5G Vinni, an EU-funded project with Telenor and a 23-member consortium, with members such as Telenor and BT. 5G Vinni aims to address the demands of verticals by inviting them to co-innovate with CSPs on network slicing (with 30+ use cases). Nokia's role is key in the project to support zero-touch orchestration, operations, and management systems for the 5G-VINNI facility (Telenor), deployed on AWS Cloud.

In addition, Nokia Bell Labs researches communication in the 6G era, as the tradition of deploying a new cellular generation approximately every decade will continue, with 6G becoming a reality in the 2030s. One of the key areas in Bell Labs 6G research is network automation and orchestration (NAO) technology, which has several high-growth segments.

How does Nokia's AI Ops improve the deployment and use of autonomous networks?
AI/Ops can greatly enhance the deployment and use of autonomous [networks] in many ways, and most CSPs are well-versed in the projected benefits of AI in operations. Backed by decades of OSS/BSS expertise and Nokia Bell Labs AI investments and other data science techniques, Nokia is in a unique position to help CSPs know which AIOps method to deploy, when to use it and why.

Ranked #1 for network automation software by Appledore, Nokia's Digital Operations automation software is designed to help CSPs design, deploy and assure services across the service lifecycle. China Mobile saw a 20% reduction in energy use when it deployed Nokia's AVA for Energy solution, delivered via SaaS. Nokia also helped Vodafone detect and remedy network anomalies before Vodafone customers were aware of any issue.

Nokia has shown how we've united our knowledge around automation, AI, and other intelligence techniques to help

CSPs create value in a connected world through AIOps.

Can you provide more details on how Nokia's AI Ops approach generates value, monetizes assets and provides the best experience to customers?
As CSPs strive to deliver faster data speeds, lower latency and better overall network performance, it's a mandate to grow beyond offering traditional connectivity services to offering new digital services over B2B2X models, and this must be executed while faced with sustained pressure to manage costs.

By adopting AI Ops, CSPs can address their top business priorities: growing revenue using AI-based tools to identify new revenue opportunities for upselling by using data about customers' consumption patterns.

CSPs can also increase revenue by using network intelligence to improve the services offered to customers and develop new services.

Delivering a better customer experience using AI models to provide insights that support CSPs' customer engagements, including services to provide targeted customer service/care. These are important for reducing churn and growing revenue.

Finally, improving service quality where AI algorithms automatically detect and predict issues that affect the quality of services offered to customers. Remedial steps are also prescribed or executed. As the network gets more complex, CSPs need to leverage AI tools to automate these functions to maintain high-quality outcomes.

By leveraging the compelling combination of our Nokia Bell Labs innovation and data science expertise, plus our proven results from customer deployments. Nokia is a leader in the real-world application of AI and ML, and we will deliver automation and intelligence — across the network and services and directly to the customer with our AIOps solutions and services. And we will help CSPs secure, automate and monetize their current and future 5G investments with AVA Intelligence Everywhere. **TR**

Navigating the 5G Era Through Continuous Innovation

To thrive in a rapidly expanding digital landscape, telcos must constantly innovate to stay ahead of the competition. Moreover, since the advent of 5G technology five years ago, over 240 commercial 5G networks have been put into operation around the world. In the Middle East alone, 5G coverage has reached 45 million people, with over 20 million 5G users, including 2.3 million 5G fixed broadband users and 57,000 5G leased line users, according to the GSMA.

As expected, emerging technologies such as AI, cloud and blockchain are making their way to the market with innovative product and service offerings. As such, telcos must look for new ways to optimize complex network operations, differentiate customer experiences and ultimately run a profitable business.

The Power of R&D

Investments in R&D to drive differentiating service offerings have been a proven practice for all successful telecom companies. Lack of R&D means telcos risk falling into a state of low yield and low growth.

In March, etisalat by e& became the first telco in the UAE to successfully implement the EUTELSAT QUANTUM satellite solution to expand 5G network capabilities over a software-defined satellite, offering its customers faster internet speeds, enhanced coverage and scalability to match the demands of high-bandwidth applications. etisalat by e& achieved this feat after intensive testing for over a year, resulting in the rapid scaling of 5G mobile network deployment.

Again in May, etisalat by e& launched its new Maritime SATCOMS portfolio of services for all vessels operating in UAE territorial waters and beyond, including 16 countries and 164 million customers served by e& across the Asia, Middle East and North Africa regions. The new etisalat by e& maritime service caters to multiple mobility clients with a range of competitively priced, flexible bandwidth options featuring relatively higher committed information rates, round-the-clock support services, and a locally operated, fully managed service that is fully compliant with local regulations. These services have helped etisalat by e& consolidate its SATCOMS deployment offerings with innovation and reliability, enabling customers to embark on a journey of seamless maritime solutions.

Similarly, to keep up with the fast pace of technological advancement, Huawei

is known for its R&D investments to efficiently expand its market reach. Huawei annually invests 10% of its sales revenue into R&D, developing new technologies to meet future demands. For example, considering the Middle East's rapid acceleration in the deployment of 4G and 5G networks, Huawei has already inked strategic MOUs with regional operators to explore advanced technologies such as 5.5G and F5.5G.

5.5G is set to revolutionize connectivity with its ultra-broadband capabilities and deterministic latency. It empowers various sectors, enhancing human-to-human, human-to-vehicle and human-to-thing interactions. The advent of 5.5G is expected to unleash a new era of digital infrastructure, enabling significant advancements in personal, vehicular and industrial connectivity. 5.5G will enhance immersive 3D interactions, facilitate the adoption of AI-generated content and transform IoT deployments, vehicle connectivity, home broadband experience and so on.

Another noteworthy mention for adopting innovation in its digital transformation journey is the telecom company Ooredoo Oman. Under its new brand tagline, "Upgrade Your World," the company has made significant progress in its presence in the telecom market in Oman. It was recently named the "Most Innovative Digitally Transformed Telecom Company — Oman 2023" at the Global Business Outlook (GBO) Awards, which recognizes and rewards companies from around the world for their performance, innovation and drive to create value.

Closing the Digital Gap

To stay relevant in the 5G era, it is the responsibility of all ICT players to contribute to bridging the digital divide across the globe. According to the UN, an estimated 37% of the world's population (2.9 billion people) is untouched by the Internet.

With that in view, ZTE, which is a global ICT solutions provider, collaborates with ITU through the Partner2Connect Digital Coalition to provide connectivity in the most remote places in various countries. In Zambia, for instance,

ZTE partnered with MTN to build the first over 100G backbone optical network in the southern part of the country to connect with border cities in South Africa, reducing international export exchange traffic and effectively lowering mobile data costs with enhanced network experience. Such practical actions can make significant contributions to building an inclusive world with sustainable connectivity access for all. Moreover, such proactive actions will build the reputation of ICT companies in the good books of the citizens of the countries where they operate, which is a pivotal factor in the company's growth.

Upskilling the Younger Generation

"While technology is getting simpler for the end users, it is getting more complex on the back end. Hence, there is a need for great talents to create, research and develop such technologies," says Nicolas Blixell, vice president and head of Gulf Council Countries at Ericsson.

A well-defined strategy for upskilling talent must be a regular feature of all telecom companies in the 5G era and beyond. The development of the ICT industry will largely depend on the capability of the task force to unlock the opportunities offered by new technologies. Only well-trained talents can navigate through the complexity of operations to come up with productive and workable solutions.

As a prime example, Ericsson has been working with the Ministry of Higher Education, Research and Innovation and universities for mentorship programs and collaborations to provide the ICT students in Oman with projects in 5G and IoT, encompassing diverse use cases in agriculture, sustainability and energy efficiency, as well as other future-ready projects. Similarly, e&'s AI Graduate program, du's INSEAD program, Huawei Executive Leadership Program, Seeds for the Future and Tech4Good are some of the programs that are equipping the new generation with the much-needed ICT skillsets.

The Menace of Misinformation and Disinformation

Last but not least in the 5G discussion is the explosion of misinformation

and disinformation that we are witnessing today. As an age-old tool used to confuse the masses, false information has taken on a new dimension in the age of artificial intelligence and machine learning, which have seen rapid adoption in the 5G era.

Any telecom company that wants to position itself as a leader in the industry must take the necessary steps to control and minimize the spread of such false information in its areas of operation. Bad actors have been overly enthusiastic about using technology to divert opinions and create confusion among the masses.

The upcoming 2024 US presidential race is expected to see the use of advanced tools powered by artificial intelligence on a wide scale to blur the lines between truth and reality.

As such, telcos will need to cooperate with governments, industry players and academia to build a defense mechanism against the spread of disinformation/misinformation.

A recent agreement between the ITU Arab Regional Cyber Security Center (ITU-ARCC) and Huawei to jointly promote public-private partnerships (PPPs) in cybersecurity is a step in the right direction.

Through the agreement, ITU-ARCC and Huawei, along with the Oman National CERT, seek to strengthen the collaboration among Arab cybersecurity experts to effectively address threats and incident response in cyberspace. It also aims to nurture an open, mutually beneficial and neutral cybersecurity ecosystem through inclusive public and private partnerships. In addition, the global ICT industry is struggling to come up with transparent guidelines on the use of artificial intelligence, which is set to radically transform our lifestyle and habits in a 5G-driven digital-first economy. Telcos must consider the above discussion in light of the huge responsibility they uphold when it comes to leading the world in the right direction in both the physical and virtual realms. **TR**

Laying the Foundation: The Importance of Digital Public Infrastructure

If the world continues to move at its current pace of technological advancement, by 2025, it will add $100 trillion in value to the world economy through digital transformation, according to the World Economic Forum.

The digital economy is accelerating exponentially, and the robustness and agility of a country's public digital infrastructure will be instrumental in developing the tools and opportunities to connect with a global audience and contribute to the digital revolution.

What Comprises Digital Public Infrastructure?

Digital public infrastructure (DPI) refers to platforms such as digital identification, payment infrastructure and data exchange solutions that help countries deliver essential services to their people, empowering citizens and improving lives by enabling digital inclusion.

By now, most of us are used to paying our grocery bills from our smartphones or smart watches as opposed to carrying a bunch of paper notes in our wallet. Transferring money across continents is just an app away and has become the go-to way of executing such transactions. Imagine, however, a situation where such transactions encounter copious errors or frequent downtimes, leading to incomplete or problematic applications.

This is where a reliable DPI comes into play. A well-designed and thought-out DPI will go a long way in helping governments meet their development targets and support their citizens with safe, secure and transparent services.

The Value of DPI

Seamless adoption of digital payments,

safe data exchange infrastructures and a thriving e-commerce sector are the ingredients for a profitable entrepreneurial ecosystem. DPIs can facilitate the power of innovation to reach untapped markets that have the potential to increase in-country value by integrating the various entities and mechanisms operating within the digital ecosystem.

5G technology is being deployed rapidly for its various use cases in different sectors. Vendors such as Nokia, Ericsson and Huawei are providing customized managed services to run networks at their optimum, with a focus on sustainability and energy efficiency as well. 5G core and IoT technology will provide the backbone of DPI to support the planned economic diversification efforts in the GCC and

MENA region. It's only a matter of time before we start seeing the revolution of fully autonomous industrial growth, and the significance of DPI cannot be overstated.

What Does It Take to Have Reliable DPI?

Industry players, telcos, regulatory bodies and policymakers must make DPI a priority to promote innovation in their respective countries. As a prime example, the Dubai Chamber of Digital Economy is supporting Dubai's digital transformation and aims to position the emirate as a global capital of the digital economy. The Chamber's ambitious strategy aims to attract 300 new digital startups in the coming years. Earlier this year, in support of the ambitious Dubai Economic Agenda D33, the Dubai Chamber of Digital Economy cooperated with relevant government entities to attract 30 startups with strong potential in the technology sector to develop the digital economy and enhance Dubai's appeal to tech investors.

The Chamber has also launched a new initiative to enhance communication with key stakeholders in the digital business community and organized a series of 10 interactive workshops for the private sector focusing on specific areas of the digital economy.

As the digital economy accelerates growth, telcos must remain ever-knowledgeable of and agile in the developments taking place. Indeed, one such sector primed for growth with technological advancements is the health sector.

The global healthcare services market grew from $7,499.75 billion in 2022 to $7,975.87 billion in 2023, at a compound annual growth rate (CAGR) of 6.3%.

In alignment with this trend, etisalat by e&'s has combined the power of GoWell, a health and wellness application, and Valeo Health to bring ground-breaking online solutions onto the wellness landscape in the region by introducing new and personalized preventive health checks for customers while offering rewards for their use. Features such

as health-age assessment, mental well-being, nutrition and other relevant services are offered on the platform. These tools promise a truly beneficial customer experience by motivating users to remain engaged with the network providers. To this end, a seamless DPI operation will be a crucial factor in the successful implementation of these life-enhancing services.

Another sector that has seen exponential growth in recent years is that of digital payments. As a preferred payment method for many customers, digital payments offer a host of benefits, including smartphone payments for the purchase of goods and services, store debit and credit card options, loyalty program information, etc., all of which are innovative financing solutions set to play a crucial role in driving economic growth in the UAE.

Moreover, mobility services are changing the way we operate in cities, and the implementation of such services will only continue to grow. Even the most common mobility service, public transportation, is changing rapidly. In efforts to support the cities' long-term goals for sustainability and safety, investments to upgrade and develop transport infrastructure are at the top of every government's developmental agenda.

To this end, micro-mobility services will also gain prominence in our society. E-cars and solar-powered e-scooters will require charging stations that are strategically located at transfer points for multimodal travel, a feature that will further encourage the adoption of eco-friendly transportation solutions. A well-integrated DPI will support these energy-efficient and cost-effective operations as well as a greater overall traffic management strategy.

The Power of Connectivity

The real value proposition for investors is the UAE's logistics connectivity, both local and global, as well as its infrastructure. For example, the country boasts access to 11 ports within a 200-kilometer radius. This accessibility has been the very reason why the UAE has been able to attract outside players to bring their businesses to the country.

The UAE government has done a commendable job of providing subsidies, financing and guarantees to facilitate market access in the country amid rising global challenges to capital access. Without a robust digital infrastructure, the present investor-friendly environment would never have been possible. The telecom companies e& and du have both been at the forefront of ensuring that the connectivity element of digital infrastructure remains at its best at all times.

Furthermore, a research, commissioned by Vodafone, suggests that Economy of Things (EoT) – a world in which vehicles, devices and machines can interact and transact with each other via a secure digital platform – will account for more than 10% of the overall Internet of Things (IoT) market, representing a compound annual growth rate (CAGR) of 68%.

Vodafone entered the EoT market in 2022 with its new EoT platform Digital Asset Broker (DAB) for its business customers. Businesses across multiple sectors can instantly connect new products to the DAB platform, rather than build their own complex systems. Their products and services will be instantly verified as trustworthy and then automatically allowed to exchange and trade data and money over secure and encrypted connections.

The Need for Collaboration and Planning

Platforms such as Vodafone's DAB are a step in the right direction. However, in today's complex, dynamic and competitive market environment, all ICT stakeholders must collaborate with public and private entities to implement strategic ideas to accelerate DPIs. This must be done through a comprehensive analysis of the information exchange between various sectors, which can itself be encouraged by fostering the next generation of digital talents. Such execution and discourse will help countries and their organizations navigate the most challenging global economic volatility and thrive in an increasingly digitalized world. **TR**

TDRA Supports FedNet With AI Services

Conforming to the rapid technological transformation in today's world, the Telecommunications and Digital Government Regulatory Authority (TDRA) has launched an initiative to support the Federal Digital Network (FedNet) with artificial intelligence (AI) services, in a major development that enhances the digital transformation journey in the UAE. This development is considered a paradigm shift in the main services provided by FedNet to government entities.

Commenting on this development, H.E. Eng. Majed Sultan Al Mesmar, TDRA Director General, said, "Digital transformations today are characterized by rapid acceleration, and what we are witnessing in 2023 indicates that keeping pace with the current era requires an unprecedented pace and a high ability to adapt and absorb new technologies. AI services on AI-supported FedNet are a great step in the digital transformation process and an important element in enhancing the ability of government entities to provide easy and fast services to all customers, which reflects TDRA's role as an enabler of digital transformation."

Through cooperation with Microsoft and Kagool, a Microsoft advanced solutions partner in Data and AI, FedNet, in its new version, will provide a set of services that fall under three pillars:

Applied AI that contributes to enhancing productivity and efficiency by reducing the time needed by developers to update procedures and processes, analyzing conversations to improve customer experiences and automating document processing to speed up work mechanisms.

Cognitive AI, which refers to simulating human behavior and thinking to solve complex problems, leading to more accurate results.

Machine learning, which uses algorithms that allow computers to self-learn by analyzing big data, extracting results from it and converting it into value.

FedNet is one of the key digital government enablers in the UAE, and it receives special attention due to its strategic importance and role in the digital transformation process. FedNet supports more than 35 federal entities and more than 5,000 virtual servers. In 2023, FedNet achieved the VMware Cloud Verified certificate for the sovereign cloud category. The importance of this certificate stems from the fact that FedNet takes into account the highest standards of cybersecurity and national privacy and that all the data is stored and processed in accordance with the relevant UAE laws.

Dubai Readies Taskforce for AI to Transform Government Operations

The Dubai Centre for Artificial Intelligence (DCAI) has announced the formation of special taskforces within 30 government entities in Dubai to harness the power of artificial intelligence (AI) and transform government operations and services.

The taskforces, launched under the directives of H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, Chairman of the Dubai Executive Council and Chairman of the Board of Trustees of the Dubai Future Foundation, were announced at the first meeting convened by the DCAI.

DCAI was introduced to enhance the work of the Dubai government and reinforce its position as a global leader in adopting cutting-edge technology. The task forces will play a pivotal role in supporting the implementation of various initiatives and projects launched by the DCAI, ensuring collaboration and knowledge-sharing between the entities and cooperation with local and global partners in the private sector.

The meeting also focused on establishing mechanisms to help DCAI forge partnerships with both public and private organizations to explore future opportunities, effectively utilize AI, and enhance government services.

Saeed Al Falasi, Director of the Dubai Centre for Artificial Intelligence, said, "The center will create taskforces comprising national talent from different government entities in Dubai. These are talents who possess the best AI skills and tools and who will use their expertise to enhance the performance of various entities by developing various applications based on AI."

"These teams will study ideas and projects that government entities will develop in cooperation with the center. They will also explore flexible and appropriate regulatory frameworks and policies for using AI in the government sector in line with current and future needs," he added.

The Dubai Future Foundation, Dubai Electricity and Water Authority, Dubai Media Council and Dubai Digital Authority will jointly oversee the implementation of DCAI's goals and outcomes in cooperation with relevant authorities.

The generative AI sector is expected to grow from $10 billion in 2022 to $110.8 billion by 2030, with a 34.3% compound annual growth rate.

TRA Bahrain, FCC Enhance Bilateral Cooperation

The Telecommunications Regulatory Authority (TRA) actively participated in the recent ITU Global Symposium for Regulators (ITU GSR-23) under the guidance of Director General Philip Marnick. During the symposium, Bahrain's remarkable advancements in the field of telecommunications were highlighted, showcasing its prominent position.

Parallel to the ITU GSR-23 event, a significant milestone was achieved as the TRA and the United States Federal Communications Commission (FCC) came together to establish a formalized relationship through the signing of a Memorandum of Understanding (MoU) between FCC Chairwoman Jessica Rosenworcel and TRA Director General Philip Marnick.

The MoU stands to enhance coordination and collaboration between the TRA and the FCC, facilitating meaningful discussions and the exchange of best practices on various vital matters. These include, but are not limited to, 5G technology, spectrum licensing, broadband deployment, accessible and inclusive communications, robocalls and the establishment of secure networks.

"In our everincreasingly interconnected world, [it] is important for regulators to collaborate, to share ideas and best practices, and work together to enhance protection for consumers. The collaboration will also support our efforts to further enhance services in Bahrain," stated Marnick.

AWS, Ministry of Economy Support SMEs' Digitization and Growth in UAE

The Ministry of Economy (MoE), represented by The Entrepreneurial Nation and Amazon Web Services, launched the AWS Connected Community initiative to support the digitization of SMEs in the UAE. It is designed to accelerate the growth and expansion of SMEs in local and international markets, in line with global best practices.

H.E. Abdullah Ahmed Al Saleh, Undersecretary of the Ministry of Economy, explained that the Ministry has been supporting the UAE's efforts to develop an integrated entrepreneurship and SMEs ecosystem. In this regard, the Ministry has been provisioning more incentives, initiatives and support programs to enable entrepreneurs to grow and expand their businesses and activities in regional and global markets, thus solidifying the UAE's status as the number one global destination for entrepreneurship and entrepreneurial projects.

The Undersecretary noted that the cooperation with Amazon Web Services opens up new growth avenues for SMEs by accelerating their digital transformation and enabling them to benefit from more than 200 technological and digital services offered by the AWS platform.

Yasser Hassan, general manager, commercial sector at Amazon Web Services Middle East, Africa and Turkey, said: "We are pleased to partner with the UAE Ministry of Economy for this initiative, through which we aim to provide support to SMEs and entrepreneurs and enable them to gain experiences and new and diverse skills that prepare them for the digital future and accelerate the pace of growth and innovation. Over the past years, the UAE has succeeded in creating an ideal and conducive environment for the growth of SMEs to become an attractive destination for entrepreneurs wishing to establish businesses."

"It is Amazon Web Services' mission to address the challenges faced by budding entrepreneurs and SME-owners by providing them with the latest solutions, services and cloud technologies from our wide and diversified portfolio of services. In today's digital era, companies of all sizes must focus on upskilling their workforce and adopting cloud computing technologies," he added.

The AWS Connected Community initiative will conduct a set of sessions and virtual workshops for entrepreneurs and SMEs to enhance their capabilities in the areas of innovation as well as the digital economy and technology. These include cloud computing, smart applications and solutions, digital media, IoT, robots, blockchain, storage and digital databases. Led by several leading experts and investors in entrepreneurship, the sessions will also provide an integrated set of incentives for online payments to participating SMEs.

This digital initiative is part of the ScaleUp platform, one of the three main tracks of The Entrepreneurship Nation, which offers support to SMEs in the UAE through services and products designed specifically to accelerate the expansion of local companies into global ones.

Cisco Plans Edge Datacenter For Cloud Security in KSA

Cisco announced plans to establish a datacenter for cloud-delivered security in Saudi Arabia to help customers protect their users, infrastructure, and investments against threat actors.

The new datacenter will play a critical role in delivering agile, highly resilient, high-capacity secure access closer to users in Saudi. It will support Cisco's cloud services including its new Secure Service Edge (SSE) solution, Cisco Secure Access. To support today's highly distributed environment with maximum productivity, Cisco Secure Access boasts automated

Internet connections, Software as a Service (SaaS) and private applications, removing complexity and increasing productivity.

The announcement reaffirms Cisco's commitment to a hybrid architecture to rapidly extend its global reach for customers. Saudi organizations will experience the benefits of Cisco's co-located edge datacenter with the scalability of public cloud. The data center will be carrier-neutral, and available on any Internet Service Provider (ISP) in Saudi Arabia. Cisco intends for the datacenter to have service availability by mid-2024.

"Today's announcement reconfirms Cisco's alignment to provide advanced cloud security protection and services to the Saudi community. It builds on Cisco's long-standing commitment to our customers and reflects our continued

support for digital transformation, by using the power of technologies to create a secured thriving digital economy in Saudi Arabia," Salman Faqeeh, managing director of Cisco in Saudi Arabia commented.

Findings of the latest Cisco Security Outcomes Report underscore the importance of security resilience.

The report revealed that 54% of organizations surveyed in Saudi Arabia experienced a security event that impacted business. The most common incidents were distributed denial of service attacks (60%), network or system outages (54%) and malicious insider abuse events (40%). The global report also states that converging networking and security into a mature, cloud-delivered secure access services edge boosted security resilience scores by 27%.

Dubai to Train 1,000 Government Personnel on Advanced AI Tech

The Dubai government has launched the Dubai Centre for Artificial Intelligence (DCAI), which aims to assist government entities in deploying future technologies across key sectors.

Announcing its launch, H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, Chairman of Dubai Executive Council and Chairman of the Board of Trustees of the Dubai Future Foundation (DFF), said, "Dubai's government will be the best in the world in deploying artificial intelligence (AI) within its various entities. This new Centre is the first step in achieving this goal and developing future services to keep pace with rapid technological advancements."

"We aim to see practical applications of generative AI technologies in our government sector. Technological development is moving very rapidly, and in

Dubai, we are determined to be just as fast in testing and harnessing it for the benefit of society. We want new AI-powered government tools to have a clear impact and tangible results," he added.

The Dubai Centre for AI aims to train 1,000 government employees from over 30 government entities on the uses of generative artificial intelligence. It also aims to launch dozens of pilot projects and improve government services, as well as increase the productivity of government employees and support more than 20 local and global advanced technology startups.

The launch of the initiative forms part of implementing His Highness Sheikh Mohammed bin Rashid Al Maktoum's directives to apply the latest AI technologies in varied sectors. The establishment of the Center comes at a time when the generative AI sector is expected to expand from $10 billion in 2022 to $110.8 billion by 2030, at a compound annual growth rate of 34.3%.

Generative AI will account for 10% of all data produced by 2025. Meanwhile, in the healthcare space, more than 30% of new drugs and materials are also expected

to be systematically discovered via generative AI techniques within the next two years.

To achieve its three main pillars, the Dubai Centre for AI will develop legislation on modern technology and study the ethical and social impact of generative AI applications and their alignment with societal and human values in Dubai and around the world.

Generative AI in Government
The Dubai Centre for AI will enhance the performance of the government sector in various ways. For instance, it will use AI to conduct simulations that study the changes and impacts of new policies and legislation, predict the results of different scenarios, evaluate the effectiveness of programs, and support complex decision-making.

The Center will facilitate the development of government services by predicting user needs and preferences. It will establish communication channels to streamline public services and employ data analysis tools to identify trends and insights that can help government entities make informed decisions.

TELECOM Review GROUP

telecomreviewgroup.com

WE'RE ON INSTAGRAM!

FOLLOW US TO KNOW MORE ABOUT
THE LATEST ICT TRENDS!

instagram.com/telecom_review

Telecom Review Leaders' Summit is back for its 17th edition, happening December 6-7, 2023. The location this year is the incomparable Great Ballroom of Le Meridien Dubai Hotel & Conference Centre.

Under its annual theme "Global. Regional. Digital.," the 17th edition of the Telecom Review Leaders' Summit will build on the success of last year's memorable event. The influential gathering will again welcome the participation of C-level executives from over 56 countries, making it a truly global summit with a regional contribution.

With its accessible hybrid format, the 2023 Telecom Review Leaders' Summit is expecting over 1,000 attendees from the vast ICT ecosystem worldwide, gathering the aforementioned C-level executives of telecom operators, along with vendors, solution providers, enterprises, regulators, governments,

NGOs, consultants, analysts, broadcasting companies, and OTTs, as well as wholesale and satellite operators.

What's New in 2023?

With Telecom Review Leaders' Summit 2023 making this December a month to remember, attendees and sponsors can take advantage of the following:

- Our most impressive lineup of speakers to date
- A wide-ranging agenda for the two-day conference sessions
- Bigger demo area with advanced digital screens
- Official recognition of hard work and capabilities under the Excellence Awards categories
- A special accommodation rate at Le Méridien Dubai Hotel & Conference Centre for all attendees **TR**

We are excited to host you in Dubai! Physical registration is open

If you are interested in sponsoring our event, you can check out all details here

If you want to see Telecom Review Leaders' Summit previous editions, visit our website here

Telecom Review Excellence Award Nominations are Now Being Accepted

Telecom Review continues its dedication and commitment to the ICT industry and will once again host the largest high-level gathering of executives at the Telecom Review Excellence Awards. These honors recognize industry leaders for their impact and efficacy throughout the year and are Telecom Review's special way of celebrating each winner's hard work and success.

The Telecom Review Excellence Awards will be open for nominations since June 20, 2023. All details for submitting the nominations can be found by here.

The complete list of awards is also available by here. This year's categories represent our industry and its full direction, so be sure to nominate your brand today!

The award nominations are open to all in our industry and represent participants throughout the Americas, Asia, Europe, Africa and the Middle East. The winners will be honored at the Gala Award Dinner on December 7 at the Le Meridien Dubai Hotel & Conference Centre in Dubai.

These awards and recognitions are an important part of the Telecom Review Leaders' Summit. ⊤ℝ

We Are Excited To Host You in Dubai	Interested In Becoming An Event Sponsor?	We look forward to receiving your nominations by September 30, 2023!
Register Now	Check Sponsor Kit	

Rima Manna, Vice President, Middle East, Nokia

Nokia's Rima Manna: Shaping Successful Regional Growth Strategies

This month, Telecom Review features another notable woman telecom leader, Rima Manna, vice president, Middle East at Nokia, who shares her insightful perspective on business, sustainability and women's empowerment.

Can you tell us more about your business and entrepreneurial role at Nokia, especially as a leading woman in the telecom industry?

Throughout my career in telecommunications and IT, I have always been drawn to companies that pushed boundaries. This drive for growth brought me to invaluable opportunities across multiple organizations covering the MEA region.

In my current position as Vice President for Nokia's Middle East Market Unit, my role is to shape successful region-wide growth strategies that include business model transformation and revitalization of sales organizations.

Early on, I saw technology as a catalyst to transform our lives, and now, I recognize it as a crucial means to preserving our planet. I am proud to be part of the collective efforts in our company and the industry to bring about these changes.

After changing its brand name, what strategy is Nokia currently adopting toward new cooperatives and partnerships in the Middle East and Africa?

The new logo reflects the energized, dynamic and modern Nokia of today: a B2B technology innovation leader playing a pivotal role in an increasingly digital world, driving productivity, sustainable growth and inclusive access. It underpins our strategy to be solely focused on being a B2B technology innovation leader and scaling the B2B business as we capture the opportunity of digital transformation in every industry.

The refreshed brand is a visual representation of Nokia's purpose: "to create technology that helps the world act together." Created from five abstracted letterforms, each works together to read as "Nokia." This is symbolic of our belief in collaboration. We are bringing together customer and partner ecosystems to create tomorrow's digital services and applications — delivering a collaborative advantage together.

Nokia's Channel Partner strategy is to strengthen and grow our Enterprise Go-to-Market approach by utilizing global Channel Partners such as Service Providers as Partners, Value-Added Resellers (VARs), Distributors, Global Systems Integrators (GSIs) and Industrial Partners. Partnering together, we bring state-of-the-art Nokia networking solutions such as Private Wireless and Passive Optical LAN with partner integration services and expertise across manufacturing, defense, mining, transportation,

healthcare, utilities and public sector industries.

Together with our partners, we provide enterprises — both large and small ones — with market-leading networking solutions and design, implementation, testing and validation services to enable further innovation and digital transformation.

Considering the significant competition, how can you create balance and sustainability in business and respond to customers' demands simultaneously?

We see the potential of digital to create a more sustainable, productive and accessible world. At Nokia, we believe that there is no green without digital. We believe that ESG is a driver of value creation and new revenue streams. Our ambition as first-movers is to create new competitive opportunities while creating tangible environmental and social benefits. We believe the technology we provide enables both environmental and social benefits to individuals, industries and communities that far outweigh any negative impacts. These benefits represent the handprint of digitalization and connectivity. We have both a social and an environmental handprint. We work hard to maximize this handprint. At the same time, we know we must continually strive to minimize any potential negative impacts of technology. This is our footprint. We work to make our footprint on the world around us as small as possible. We collaborate throughout our value chain to continually minimize our footprint.

In the Middle East, I have seen that our ESG strategy resonates very well with our customers. We signed several MOUs with key CSPs to collaborate on maximizing our roles when it comes to ESG in the region. We continue to work closely to bridge the digital divide, empower women in technology and make sure that we reduce the waste and carbon footprint related to our products and solutions. I am really very happy to see that, as an industry, we are taking the right steps and prioritizing sustainability.

As a woman telecom leader, how would you describe women's progress in the labor market in general? In the telecom industry in particular? What are the key challenges?

While great strides are being made in including more women in the telecom industry, there is still a lot of work to be done to ensure greater diversity and equality, and the private sector is a vital stakeholder in making this a reality.

Agenda 2030 for Sustainable Development states that "information and communications technology and global interconnectedness have great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies." It is therefore critical that, as an industry, we enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.

According to UN Women, there are several barriers that contribute towards creating and sustaining the gender gap in innovation and technology, which include the underrepresentation of women innovators and entrepreneurs and the continued prevalence of negative gender stereotypes.

Finally, how does Nokia support women and seek to activate their roles in current and future projects?

As Nokia, we are proud signatories of the Women Empowerment Principles (WEPs), a set of Principles offering guidance on how to promote gender equality and women's empowerment in the workplace, marketplace and community. We are also collaborating with UN Women, the United Nations entity for gender equality and women's empowerment, to further promote inclusion and diversity in the Middle East and Africa. As part of the current collaboration, Nokia continues to work on implementing the WEPs, and UN Women involves Nokia in its outreach initiatives to promote inclusion and diversity in society. Under this collaboration, the two organizations have launched the following four different pilot projects.

Increasing the number of women employees, this project aims to increase the number of women employees in Nokia Saudi. As part of this project, the company will continue to foster a fair and dynamic working environment for female employees. Nokia employees will also reach out to female students in universities to create awareness and motivate them to join the workforce.

In addition to this, the project includes raising awareness of cervical cancer and uterine fibroids, promoting STEM education and empowering gender-based violence victims.

We also recently successfully concluded our first "Women in Leadership" program in partnership with e& and UN Women, solidifying our commitment to promoting gender diversity, empowering women and encouraging sustainable business practices. The "Women in Leadership" program is designed to increase the number of women in decision-making roles within the tech sector and integrate gender-balanced approaches to innovative business opportunities and technology solutions. The program aligns with the UN Women's Empowerment Principles, of which both e& and Nokia are signatories, with the goal to empower women to pursue leadership roles and contribute to a better future for all.

Throughout the program, the participants not only embraced the challenges related to sustainability and women's empowerment, but also demonstrated a remarkable capacity for collaboration, innovation and critical thinking, leaving a lasting mark of excellence.

The module journey of the program supported the participants in choosing their challenges that focused on ESG, inclusion and diversity, partnering to work beyond borders and creating innovative business solutions. The challenge winners presented groundbreaking design concepts and prototypes, receiving well-deserved recognition for their innovative ideas at the closing event. **TR**

Philippe Vogeleer, Group Head of Business Development, Vodafone Group

Together We Can – Repeat Partnerships for Growth

Telecom Review conducted an interview with Philippe Vogeleer, group head of business development, Vodafone Group, to discuss the recent entry of the World Bank Group into the global consortium that Vodafone, Vodacom and Safaricom formed a couple of years ago with Sumitomo Corporation and British International Investment, and the opportunities opened by this innovative way of delivering projects via repeat work with select strategic partners. He also elaborated on how Vodafone is serving its belief in a digital society, and shared thoughts about the evolution of the digital world and mobile connectivity.

How does Vodafone contribute as a member of this unique consortium, especially considering the deal recently signed with the World Bank Group?

When the government of Ethiopia decided to open their market some years ago, we thought that because it's a huge market — 120 million people, 3.5 times the landmass of Germany — it would be better for us to work on this opportunity with strategic partners. That's how our consortium was originally created: the members of the Vodafone family decided from the start to team up with companies from Africa, Europe, Asia, and North America to make sure we would bring the best of the planet to this unique project.

We originally formed a consortium between British International Investment (BII), Sumitomo Corporation, Vodafone Group, Vodacom and Safaricom to invest in this project, supported by a series of US and local supporters. The rest is history: 12 contenders originally entered the Ethiopia license race, which we ultimately won; we have since deployed a mobile terrestrial network and attracted more than four million customers to it in the seven months since launch.

In June 2023, we received a major boost with the news that the World Bank Group, one of the world's largest development finance institutions, would team up with us. The negotiations for what is now one of the largest investments of the World Bank Group (WBG) in Africa were led by Vodafone Group, in full alignment with our partners. We've decided since to expand this cooperative concept and proposed to the same top partners to work together on multiple projects.

First things first: the International Finance Corporation (IFC), the private sector arm of the WBG, is making a $157.4 million equity investment into Safaricom Ethiopia's parent company, the Global Partnership for Ethiopia (GPE). IFC is also providing a $100 million loan as a first tranche of debt facilities. The Multilateral Investment Guarantee Agency (MIGA), the member of the WBG that provides political risk insurance for projects, is providing a 10-year insurance guarantee of $1 billion.

The members of our consortium are working in parallel on various "repeat" partnerships involving the same organizations, so that we can bring the same approach of teaming up with select strong partners to multiple projects in various regions. We are currently working on dozens of projects this way in areas as diverse as infrastructure, energy, platforms, devices, and services. Fascinating to see a cooperation concept originally created for a unique project now developing as a new way of working elsewhere.

Vodafone believes in a connected digital society. How are the company's networks, products and services serving this belief?

Vodafone decided a long time ago that, to grow, it should closely associate itself with the development of society. So, very concretely, we can help you as a person, or we can (try to) help the whole of society including you. We chose the latter. For that, we need to understand what each of the countries in which we deliver services is trying to achieve in terms of development, and then think about the services we can bring that can make a difference to those societal objectives.

We do a lot of analysis with local and international partners to understand the countries in which we deliver services and the needs of the population so that we can deliver tangible solutions. We understood rapidly that we should choose our battles to be successful at scale, and we adapted to that: focus is key in business, so we decided to use the framework of the Sustainable Development Goals (SDGs) of the United Nations to structure our work, and to focus on the SDGs for which we can have the most impact.

The investments required to deliver are very significant. We now know that doing those investments alone is not the sole solution anymore, as evidenced by the success of our consortium in Ethiopia, and that companies can increase their chances of success by teaming up with other organisations sharing their values. Having myriads of partnerships is probably not the solution either – too complex operationally. The sweet spot seems to be in repeat partnerships with a small number of very strong partners.

Tell us more about Vodafone's strategy to serve emerging markets.

Vodafone essentially has three divisions. First, we own or co-own a portfolio of telecom companies. Vodafone is one of the largest suppliers of mobile, next-generation broadband and television services in Europe. In Africa, we supply mobile and broadband through the Vodacom and Safaricom brands and are also the continent's largest supplier of mobile financial

services via M-Pesa and the VodaPay app.

Then we have our partners; we have a very large number of those — 29 telecom companies in 46 countries that we do not own but support to deliver their objectives.

Then we have a third division, named Vodafone Business, where we help companies grow their business around the globe. The latter can take various forms, from delivering advanced telecom services to them to working with suppliers to deliver innovation to even possibly co-investing in technology-based change with them. Low latency 5G private networks in industrial plants are an example of the latter.

For emerging markets, we will continue to provide a mix of those three approaches: grow our mobile broadband and financial services business by investing ourselves or alongside our key partners; partner with telecom companies or other tech companies in some other markets to deliver solutions; and serve individuals and businesses the best way we can, with a view to contributing to economic development.

From your perspective, how could Vodafone support the evolution of the digital world and ongoing innovations of mobile connectivity?

Mobile is going through fantastic changes. 5G is a phenomenal technology. It's much faster and efficient than 4G before, with the ability to connect far more devices than ever before to mobile sites. The possibility of bringing accuracy and processing very high volumes of data opens doors to a whole raft of innovations at all layers of society, which is absolutely fascinating.

Our industry is also in the process of shifting towards open RAN, a technology that will greatly increase the number of vendors providing network equipment. That will enhance innovation and network performance and drive down costs over the long term.

Last but not least, a new generation of low-earth-orbit satellite providers will also literally change the rural telecom landscape, especially in remote

and very remote areas, by enabling operators, in the case of our partner AST SpaceMobile, to deliver mobile broadband directly to smartphones in far more regional locations than was ever possible in the past.

I think that these changes will transform once again the role that telecom players have: mobile started 35 years ago as a means to empower individuals; it then evolved some years ago as a way to help solve societal challenges; and it is evolving again to deliver connectivity in more locations and become an integral part of industrial production in parallel. A deeper part of the fabric of each country, if you want.

Delivering this new round of developments will of course require investments and very advanced skills at the same time, which means that partnerships between top organizations bringing each piece of the puzzle together will become ever more important. All extremely exciting indeed! **TR**

> **The sweet spot for investments seems to be in repeat partnerships with a small number of very strong partners**

Battle of the Century: Will Technology Take Over Jobs?

Experts say that artificial intelligence could replace up to 80% of human jobs in the coming years. That's a hefty number that is sure to raise debate and a fair share of worry. But as it stands today, for AI to fully mature with human cognitive abilities that can best handle the unknown, it still must take a big leap beyond its current state of training and programming.

The development of generative AI is already well suited for less complex work. A 2023 study by Goldman Sachs found that as many as 300 million jobs could be lost to AI-powered automation. Indeed, jobs involving paperwork should be automated in the name of cost savings, a trend we'll surely see more of in the coming years.

Commenting on the debate around the rewards and risks of AI such as ChatGPT, US-Brazilian researcher Ben Goertzel asked, when considering the dangers of spreading misinformation, "Why haven't we banned the internet? The internet does exactly this." It spreads fake information in a matter of clicks and seconds.

Citing elderly people as an alternative example, Goertzel reminded that humanoid robots can serve as companions and provide emotional and social support. Presenting the good side of AI, such personalized technology will

answer questions, listen to stories, help place a call or order something online, all in an effort to improve people's lives.

"The problem is that the companies funding most of the AI research don't care about doing good things. They care about maximizing shareholder value," concluded Goertzel.

More Replacement or Greater Opportunities?

According to a study by sociology professor Eric Dahlin, there is no need to fear an imminent robot takeover of jobs because the rate at which robots are replacing humans is not as high as many people believe.

Humans' fear of being replaced by automated work processes dates back to the early 1800s, and the current attention-grabbing headlines predicting a dire future of employment have overblown the threat of robots taking over jobs.

Workplaces globally have boosted the integration of employees and robots to generate more value for human labor. Robots are supporting, not fully displacing, workers.

"An everyday example is an autonomous, self-propelled machine roaming the aisles and cleaning floors at your local grocery store," says Dahlin. "This robot cleans the floors while employees clean under shelves or other difficult-to-reach places."

Automation is impacting the operations within businesses and has shifted workers to being behind screens, machines and the robots themselves. With technology assuming more of the front-facing scenarios, people have reverted to being more out of sight.

Way back in 2014, an analysis estimated that automation would wipe out nearly half of all jobs by 2034 and that self-driving technology would eliminate the need for human taxi and delivery drivers. Yet, nearly a decade later, these forecasts are nowhere near being fulfilled. A World Economic Forum 2020 report estimated that while 85 million jobs would be replaced by machines by 2025, a greater figure of

roughly 100 million new jobs would be created to support a more digitally driven economy.

Career coaches and HR experts are encouraging employees to focus on what they can control instead of anxiously fixating on what they can't. Investing time into learning how to work alongside technology and treating it as a resource rather than a threat will undoubtedly make all employees more valuable in their jobs moving forward.

AI for Efficiency

Turning to insights from academia, various professors agree that while concerns about AI-based technology taking over people's jobs have skyrocketed, the reality is not that simple to execute. Even if it will impact certain jobs as "physical machines, software systems and combinations of hardware and software get more capable," tasks that require a strong human element are harder for technology to replace.

Still, those positions that are highly repetitive or based on systematic instructions are indeed vulnerable. With such job functions, it's considered "economically viable to replace a greater share of the portions of the human work with machines."

As with most technological advancements, it is natural to be worried about job loss and displacement, but similar disruptions have happened before (e.g., the spread of computers and more specialized machines in factories).

History shows that even if jobs are lost to new technology, other roles will be created in their place. In fact, people working alongside artificial intelligence rather than being replaced by it is the more likely scenario for now.

Many businesses are using AI to enhance employee efficiency and are further supporting them by upskilling them and creating frameworks around using such technology responsibly and effectively. Leaders are embracing AI to drive material efficiencies for their businesses and are reconfiguring roles to maximize strategic decision-

making, particularly with these new technologies.

Alas, in the long run, AI and other innovations in its wake may indeed replace some jobs, as they will generally become a bigger part of everyday work life. There is no doubt that jobs are transforming as AI and other technologies become more accessible, smarter and more mature. The best path forward would seem to be one of smooth integration, with these technologies acting as a powerful extension of their human counterparts.

"COVID-19 has accelerated our transition into the age of the Fourth Industrial Revolution," says Klaus Schwab, founder and executive chairman of the World Economic Forum. "We have to make sure that the new technologies in the digital, biological and physical world remain human-centered and serve society as a whole, providing everyone with fair access." **TR**

Humans' fear of being replaced by automated work processes dates back to the early 1800s

CPaaS for Modern Businesses: Unifying Channels, Amplifying Impact

From a B2B perspective, Communication Platform as a Service (CPaaS) is a powerful tool that enables enterprises to enhance their communication capabilities and streamline their communication workflows.

CPaaS can benefit enterprise communications through customization and integration; multi-channel communication; scalability and flexibility; workflow automation; enhanced customer engagement; and rapid development and innovation.

In the GCC region, the CPaaS market is experiencing significant growth as countries have been witnessing rapid digital transformation, increasing smartphone penetration and growing demand for enhanced communication and collaboration tools.

Some of the common use cases of CPaaS include SMS and voice notifications, two-factor authentication, customer engagement, contact center solutions and real-time communication capabilities.

The region's CPaaS market has been driven by factors such as the rising adoption of mobile and cloud technologies; the growing popularity of omni-channel communication strategies; and the need for seamless and efficient communication solutions.

Additionally, the GCC governments' initiatives to promote digitalization and entrepreneurship have contributed to the expansion of the CPaaS market.

But before we deep dive into CPaaS, it is important to first understand the essence of enterprise communications in today's digital era.

Booming Enterprise Communications

The COVID-19 pandemic accelerated the adoption of remote work and digital transformation initiatives. Many organizations shifted to remote or hybrid work models, requiring robust communication tools to facilitate collaboration and maintain productivity. This increased demand for enterprise communication solutions.

Indeed, maintaining effective communication is crucial for collaboration and productivity within organizations. Businesses are increasingly recognizing the importance of seamless communication channels to enable teams to work together efficiently, irrespective of location. Integrated communication platforms and tools have become essential for enabling real-time messaging, video conferencing, document sharing and project management.

Furthermore, with the proliferation of mobile devices and the rise of remote work, employees increasingly expect the flexibility to communicate and collaborate from anywhere, at any time. Enterprise communication solutions that offer mobile accessibility and support for multiple devices have become increasingly popular, allowing employees to stay connected and productive on the go.

Effective enterprise communications are also vital for delivering exceptional customer experiences. Enterprises are leveraging communication platforms, with features like chatbots and virtual assistants to enable more efficient customer interactions, leading to improved satisfaction and loyalty.

By embedding communication functionalities within existing systems like CRM, helpdesk or project management tools, organizations can also enhance communication efficiency, automate processes and improve overall business operations.

These are just some of the factors that contribute to the booming enterprise communications market as organizations recognize the value of robust and integrated communication solutions to drive productivity, collaboration, customer engagement and digital transformation efforts.

CPaaS Plays a Crucial Role in Enterprise Communications

Importantly, CPaaS allows businesses to customize and integrate communication functionalities directly into their existing applications or workflows. By providing a unified platform to manage and orchestrate interactions across channels, they ensure consistent and efficient communication experiences.

In context, CPaaS solutions are built on cloud infrastructure, providing scalability and flexibility to handle varying communication needs. Enterprises can easily scale their communication capabilities up or down based on demand, optimizing resource allocation and costs.

Amazon Web Services (AWS) is one of the leading providers in the CPaaS space. We have a few examples of how AWS services can be utilized as a part of a CPaaS solution. Amazon Connect is a cloud-based contact center service that offers APIs for integration with existing systems and workflows, while businesses can integrate the Amazon SNS (Simple Notification Service) APIs for real-time messaging capabilities into their applications. Furthermore, AWS Lambda is a serverless computing service that allows businesses to run code without managing servers and functions with an event-driven architecture, making it a suitable component for CPaaS solutions.

With the example above, it is shown that CPaaS APIs allow businesses to automate communication processes and integrate them into their workflows. This eventually led to personalized and interactive communication.

By leveraging CPaaS, enterprises can accelerate the development of communication-enabled applications and services. The pre-built communication functionalities and APIs eliminate the need to build communication infrastructure from scratch, saving time and resources while enabling rapid innovation.

Another case study in the CPaaS space is engageX, a notable offering developed by e& enterprise. This robust solution is designed to accelerate businesses' digital transformation journeys. It equips organizations with the necessary digital channels, facilitates the implementation of efficient processes and provides expert services, all aimed at enhancing their overall digital capabilities.

engageX boasts an extensive library of simple-to-complex use cases that cover the entire customer journey. This empowers users to customize their solutions according to their specific needs and preferences. In fact, the versatility of the platform extends across multiple sectors, including e-commerce and retail; banking; healthcare; government; energy and utility; entertainment; automobile; real estate; and hospitality.

Overall, engageX serves as a comprehensive digital engagement model, empowering businesses to connect and interact with existing and potential users through a wide array of digital channels.

Similarly, while BlueJeans by Verizon does primarily focus on video conferencing and collaboration, its APIs, SDKs and integrations can provide some CPaaS-like capabilities. These features allow businesses to extend their communication capabilities, embed video conferencing functionalities into their applications and integrate video communication into their existing workflows.

CPaaS Market Growth Potential With Latest Technologies

The expansion of CPaaS services is primarily responsible for this specific market's growth as the world

becomes more digitally driven. As a result, CPaaS services will be crucial for facilitating transactions, marketing and customer support. Here are some ways CPaaS can leverage the latest technologies for future growth:

- **Artificial Intelligence (AI) and Natural Language Processing (NLP)**: CPaaS can integrate AI and NLP capabilities to enable advanced communication functionalities. Chatbots and virtual assistants can be developed using AI to automate customer interactions and provide personalized, intelligent responses. NLP can enhance voice and text-based communication by enabling language understanding, sentiment analysis and real-time language translation.
- **Internet of Things (IoT):** CPaaS can integrate with IoT devices and sensors to enable communication and data exchange between connected devices. This integration can facilitate automated alerts, remote monitoring and real-time notifications, enhancing communication capabilities in areas such as smart homes, smart cities and industrial applications.
- **Video Conferencing and Collaboration:** CPaaS can leverage advancements in video conferencing and collaboration technologies to provide high-quality video and audio communication experiences. Integration with virtual reality (VR) and augmented reality (AR) can enable immersive collaboration, remote training and virtual meetings, bringing a new level of engagement to enterprise communications.
- **Cloud Computing and Serverless Architectures:** CPaaS heavily relies on cloud infrastructure, and the adoption of cloud computing technologies will further enhance its scalability, flexibility and reliability. Serverless architectures can enable more efficient resource allocation, automatic scaling and reduced infrastructure management overhead, allowing CPaaS providers to deliver seamless and cost-effective communication services.
- **5G and Edge Computing:** The rollout of 5G networks and the proliferation of edge computing will significantly

impact CPaaS capabilities. 5G's high speed, low latency and increased bandwidth will enable real-time communication, while edge computing can bring the processing power closer to the end-users, reducing latency and enabling faster response times.
- **Security and Privacy Enhancement**s: As communication becomes more digital and interconnected, security and privacy become paramount. CPaaS providers will continue to invest in robust security measures, including encryption, authentication mechanisms and compliance with privacy regulations, to ensure the confidentiality and integrity of communication data.

As CPaaS continues to embrace and integrate these latest technologies, it is expected to offer even more innovative and comprehensive communication solutions, driving further growth and adoption across various industries and business sectors.

A Promising Future for CPaaS
Emerging trends and technologies in CPaaS are shaping the future of enterprise communications. Evidently, as businesses increasingly embrace digital transformation and migrate their infrastructure to the cloud, the demand for cloud-based communication services like CPaaS is expected to rise. CPaaS leverages cloud infrastructure to deliver scalable, flexible and cost-effective communication solutions, aligning well with the evolving needs of modern enterprises.

The API economy is also flourishing, with businesses recognizing the value of integrating third-party services into their applications. CPaaS providers offer APIs and SDKs that enable developers to embed communication capabilities directly into their applications, fostering innovation and customization.

Extensively, CPaaS has the potential to cater to a global market, with businesses becoming more interconnected and operating on

a global scale. The demand for unified communication solutions that can facilitate collaboration and connectivity across regions is likely to grow.

While CPaaS is gaining momentum, it's important to recognize that the market is competitive and evolving. Other factors, like regulatory considerations, local market dynamics and the emergence of new technologies, can certainly influence the future landscape. Additionally, regional players and established telecom operators may have a significant presence in specific markets, contributing to a diversified competitive landscape.

Overall, while global domination is yet to happen as the market matures, the increasing demand for integrated communication solutions, the ongoing digital transformation, the rise of the API economy and ICT advancements suggest a bright future for CPaaS. ▥

"

CPaaS allows businesses to customize and integrate communication functionalities directly into their existing applications or workflows

,,

The Metaverse and Data Protection: How Companies Can Proceed Smartly

The interoperable, dynamic and open space known as "Metaverse" will digitally disrupt many sectors. It is set to offer exceptional experiences for customers in banking, financial services, insurance, real estate, media and entertainment, as well as gaming. It is as all-encompassing as it is lucrative.

According to experts, investments in the Metaverse surpassed $120 billion in the first half of 2022 alone and will generate up to $13 trillion by 2030.

This shows that many companies have started their integration into this new environment, already taking into consideration the massive potential of Metaverse inclusion. But to succeed in the Metaverse, businesses must consider how they will collect, use and manage data as they enter this uncharted virtual territory.

One of the primary concerns is that the Metaverse is a place where users can interact anonymously, which makes it difficult to track who is doing what. This anonymity can lead to online

harassment, cyberbullying and other forms of malicious behavior.

And the shift towards these needed protections is not as easy as it seems; it necessitates a lot of procedures at the security level. The data-driven opportunities of the Metaverse hold privacy and data security risks as well as legal compliance challenges.

As far as security is concerned, the Metaverse needs to be very agile and flexible in adapting its cybersecurity and privacy programs in order to stay in step with relevant technological changes. Regarding the legal aspect, the current applicable laws and regulations currently lag behind the rapid development of the new technologies they're designed to address. Nowadays, many countries are scrambling to draft laws to govern AI development as well as regulate the collection and use of biometric data.

However, despite this current dearth of specific legal guidance, as more

businesses plunge into the Metaverse and virtual life becomes mainstream, companies will need to strengthen their approach to Metaverse-related privacy and cybersecurity risks. In other words, Metaverse should have its own specific data laws. And until the issuance of these laws is complete, these companies will be left to draft their own protection plans and hope for the best.

A Protection Plan Before Diving In
As a basic tenet, companies must understand the purposes of their data collection efforts: what data do they plan to collect? For which uses? And with whom are they going to share this data?

As a first step, companies diving into Metaverse should create an inventory of information assets and prepare data flow maps to realize the lifecycle of data generated in the Metaverse. This will enable the business to make strategic decisions at the outset. Companies that treat the Metaverse as a digital playground or testing lab

without thinking about information protection will likely have a short life in the Metaverse. This is especially true in a world where information collection is everywhere.

A Privacy Program That Adheres to Global Principles
Even though the full application of laws in virtual worlds is still a ways off, companies entering the Metaverse should build an accountable privacy framework that adheres to common global principles. A "transparency framework" could be among these values. Additional focuses can include individual data protection rights; the integration of appropriate security safeguards; adopting a risk-based approach to privacy protection and responsible innovation; and ensuring accountability for data processing in the Metaverse. And all of the above can be corroborated by incident response measures.

Readiness for When Things Go Wrong
Due to the daunting amount of

nefarious opportunities in this virtual environment, the risk of security incidents is very high. Companies operating in the Metaverse should have their incident response plans at the ready to anticipate any new challenges and threats they may encounter.

On the data privacy front, there should be recourse for users who are the subject of Metaverse-related privacy infringements and data misuse. Businesses operating in the Metaverse should consider in advance how they will address these sorts of violations and what punishments they will enact.

Data Security Protections Implementation
As the Metaverse continues to evolve, new threats will inevitably emerge. And given the high potential for cyberattacks of every kind (including social engineering, data breaches and virtual identity, to name a few), data security is a challenging but necessary requirement in order to

succeed on this journey. To this end, securing their software development should also be a top priority for all Metaverse companies. This should include rigorous software testing, secure coding and appropriate account security features.

In addition, certain technologies can help mitigate anticipated security risks in the Metaverse. For example, the blockchain ecosystem can aid in preventing the theft of digital property such as NFTs, and AI technology can assist in fraud detection and prevention. As the Metaverse takes shape and new security threats are identified, companies should work together to develop a set of Metaverse-specific protocols to guide best practices for data security in this new world.

The Metaverse is still growing — still taking shape — but now is the time to prioritize privacy and security to ensure a safe and enjoyable experience for all users moving forward. **TR**

The Metaverse needs to be very agile and flexible in adapting its cybersecurity and privacy programs

du, Environment Agency-Abu Dhabi Together Commit to Sustainable Future

du, from Emirates Integrated Telecommunications Company (EITC), and the Environment Agency – Abu Dhabi (EAD), have signed a memorandum of understanding (MoU) to establish a partnership aimed at harnessing the latest technologies to enhance over 20 long-running and highly effective sustainability initiatives.

Under the arrangement, the two entities aim to develop a clear framework for coordination and cooperation to help them achieve their combined goals of enhancing environmental communication and awareness efforts for millions of people, especially regarding the issue of climate change.

Dr. Shaikha Salem Al Dhaheri, Secretary-General of EAD, said, "We are pleased to enhance cooperation in the technology field between EAD and du, as part of the UAE's ambitious vision to achieve sustainable development. This became evident with the declaration by President His Highness Sheikh Mohamed bin Zayed Al Nahyan that 2023 is the 'Year of Sustainability.' Similarly, the UAE's hosting of COP 28 this year coincides with our continuous endeavors to raise awareness and disseminate information related to environmental issues, climate change and sustainability."

Meanwhile, Fahad Al Hassawi, CEO of du, said, "At du, sustainability is at the heart of our business, and the partnership with the Environment Agency – Abu Dhabi is perfectly aligned with our commitment to contributing to a sustainable future, and we are excited to benefit from our expertise in technological development and communications to contribute to making the UAE more sustainable."

Al Hassawi noted that in addition to focusing on digital transformation activities, du is also committed to achieving sustainability. du has implemented many sustainability initiatives to reduce its environmental impact, including using renewable energy sources, reducing carbon emissions and providing technical solutions to the UAE market to reduce carbon emissions resulting from business operations.

The MoU reflects EAD and du's vision for a future in which technology plays a pivotal role in mitigating environmental challenges and promoting sustainable development in the UAE.

Vodafone Eyes 5G Expansion in UK With Latest Merger

Vodafone has agreed to merge British operations with Three UK, owned by Hong Kong-based CK Hutchison, to accelerate the rollout of faster 5G connectivity, the companies have jointly announced.

Huawei, a major supplier of equipment for mobile telephone networks has been banned in the UK, which has greatly hampered 5G expansion across the country.

Vodafone and CK Hutchison said in a joint statement that a new combined group is seen as having a value of £16.5 billion ($21 billion) following the deal's completion due by next year.

"The merger is great for customers, great for the country and great for competition," said Vodafone chief executive Margherita Della Valle, who recently cut 11,000 jobs at the group.

The merger will create Britain's biggest mobile operator with about 27 million customers, overtaking BT's EE and VM O2, the latter owned by Telefonica and Liberty Global.

The deal is expected to face intense scrutiny from regulators, who have previously opposed deals that stifle competition.

The merger will lead to a network investment of £11 billion over ten years, the company's statement said.

CK Hutchison has maintained that the tie-up will have the best-in-class 5G network for the UK.

The transaction will see Vodafone take 51% of the combined group and CK Hutchison 49%.

Separately, e& and Vodafone Group Plc have agreed to a strategic relationship that will bring certain aspects of the two operators' businesses closer together across Europe, the Middle East and Africa.

As part of this strategic relationship, e& and Vodafone have entered into a relationship agreement that establishes e& as a cornerstone shareholder of Vodafone (the "Relationship Agreement"). This is the next phase in a strategic relationship that began in May 2022, when e& made its original investment in Vodafone.

5G Breakthrough: Zain KSA Successfully Tests Ambient-Powered Passive IoT

Zain KSA has successfully conducted trials of its practical applications for Passive Internet of Things, an IoT technology that runs on ambient energy sources (i.e., non-battery). The remarkable breakthrough aligns with Zain KSA's strategy to enhance the 5G experience in the Kingdom and unlock the advanced capabilities of its 5G network to deliver innovative solutions and services to its customers.

The self-operating Passive IoT stands as a promising future application of 5G networks, opening up a multitude of opportunities for advancements across industries like logistics, healthcare, smart agriculture and more. This technology enables companies to enhance operational efficiency and rationalize expenses. Unlike traditional IoT devices, Passive IoT Tag devices do not require active power sources, which makes them easy to install, reduces the need for maintenance and frequent replacement and provides a long lifespan, further reducing costs.

Following the successful test of the Passive IoT model, Zain KSA ushers in a new era of innovation and operational efficiency that will revolutionize business practices across various sectors. The test results demonstrated remarkable accuracy in asset tracking, enabling the identification of remaining stock and delivering real-time temperature updates.

Commenting on the new breakthrough, Eng. Abdulrahman bin Hamad Al-Mufadda, Zain KSA's CTO, said, "Zain KSA is dedicated to constructing an inclusive digital ecosystem rooted in innovation and progress, leveraging the full potential of our 5G+ network to generate economic and societal benefits by supporting the nationwide digital transformation and serving Saudi Vision 2030's overarching goals of achieving sustainable economic diversification and improving the quality of life. By introducing Passive IoT, we are opening up new spaces to employ the capabilities of 5G+ networks, offering our customers innovative and sustainable solutions that drive operational efficiencies while reducing costs. These environmentally friendly technologies empower businesses to boost productivity and accomplish their technical objectives through integrated all-digital processes."

Omantel Innovation Labs Startups Partake in Advanced Cybersecurity Program

Omantel, the leading provider of integrated telecommunication services in the Sultanate of Oman, hosted the UK Oman Digital Hub pilot program to give Omantel Innovation Labs startups access to advanced sessions on cyber security awareness, protection against supply chain risks, developing a cyber security "culture" and testing new solutions.

The five-week pilot program, supported by the UK Oman Digital Hub, was delivered by innovation companies Plexal and Al Jabr to startups at Omantel Innovation Labs, a key player within the local startup ecosystem.

The program also included peer-to-peer collaboration on security challenges, mentoring sessions with cyber experts, knowledge sharing by founders of startups and action plans for securing a business.

The program, which began in February 2023 at the Omantel Innovation Labs, comprised multiple workshops conducted by experts including Amjad Beainy, co-founder and CTO at Octopus CyberSecurity and Maitham Al Lawati, CEO of PowerDMARC, as well as speakers from the United Kingdom, including Stacey Lidgate, director of business development at Cysiam, and Trevor Graham, CEO and co-founder of Ampliphae.

The deep dive sessions were part of a wider program called "Cyber Oman," sponsored by the British Embassy in Muscat, which aims to support the development of a cyber-resilient ecosystem and a community with strong cyber security skills.

HH Al Sayyida Ghada Al Said, senior manager at Omantel Innovation Labs, said, "It was a pleasure to work with the UK Oman Digital Hub to allow our startups to have this level of access to expert cyber security advice and insights."

Meanwhile, Jessica Hern, senior program manager at the British Embassy in Muscat for the Foreign, Commonwealth & Development Office (FCDO), said, "We are delighted to work with Omantel Innovations Labs on the first pilot of the Cyber Oman 'Secure' program, which aims to enhance Omani startups' cyber security knowledge and give them the skills to ensure their infrastructure can respond to cyber threats. We look forward to continuing our work with our partners like Omantel to build on the foundation that was laid during the first deep dive sessions."

du: Committed to Becoming a Net Zero Telecom Service Provider

du, from Emirates Integrated Telecommunications Company (EITC), a leading ICT service provider in the United Arab Emirates (UAE), has launched a project to upgrade 300 DG (diesel generator) sites in the remote communities of the UAE as part of its ongoing efforts to achieve its objective of becoming a Net Zero ICT service provider and promote sustainable development in the region.

As the first country in the Middle East to pledge its commitment to net zero, the UAE has taken a bold step towards reducing its carbon footprint. In 2021, the UAE government officially released the Net Zero by 2050 strategic initiative.

du is one of the industry leaders in advocating greener strategies in line with the Paris Agreement and the UAE Net Zero 2050 strategic initiative. du aims to achieve its carbon reduction goals and has developed a long-term plan including various measures. One key element of the plan is focusing on optimizing the carbon footprint of its ICT infrastructure.

With a commitment to delivering the benefits of ICT to everyone, du has been working to bring network coverage to even the most remote communities. However, the power supply in these areas could not be provided without the use of diesel generators (DGs) as the primary energy source. This not only generates CO_2 emissions but also incurs high operations and maintenance costs.

To address these challenges, du partnered with Huawei, a leading global ICT infrastructure and digital power solutions provider, to deploy advanced hybrid power solutions. These solutions will reduce reliance on DGs, minimizing O&M (operations and maintenance) workload and energy consumption. As such, du will upgrade more than 300 DG sites, improving energy efficiency and network coverage while addressing the carbon footprint. By deploying advanced hybrid power solutions with state-of-the-art Lithium Batteries, du will be able to reduce carbon emissions by 10,000 tons, equivalent to planting 500,000 trees annually. This highlights du's commitment to sustainable development and contributing to social causes through technological innovation.

Saleem AlBlooshi, chief technology officer at du, said: "As a company deeply dedicated to sustainable development, we take immense pride in proactively implementing measures to significantly reduce carbon emissions. By deploying state-of-the-art hybrid power solutions across over 300 communication sites throughout the UAE, we are actively decreasing our dependence on non-renewable energy sources. This initiative not only lowers our carbon footprint but also ensures the delivery of more eco-friendly and sustainable services to communities in even the most remote desert regions. Our unwavering commitment to environmental responsibility reflects our determination to contribute to a greener and more sustainable future for all."

This initiative is one of many ways in which du contributes to a low-carbon future. The company remains committed to working with world-leading suppliers to reduce carbon emissions and promote sustainable development through technological innovation.

Ooredoo Oman: 5G Network Reaches Full Coverage in Oman

Ooredoo Oman has announced that its 5G network now encompasses the entire country of Oman. The business claimed recently on LinkedIn that "our 5G is everywhere and anywhere in Oman." Ooredoo Oman customers may now take advantage of super-fast 5G services across the nation thanks to this important milestone.

Store Expansion
Ooredoo continues its retail development plan, as it is dedicated to offering an unmatched customer experience to an ever-larger Oman audience. The telecom behemoth established its 46th franchise location on June 11, 2023, in Izki, a city in the Dhakiliya area. The new business seeks to provide local residents with a wide selection of goods, services and technological solutions. The sales staff will also determine the demands of the neighborhood market and cultivate strong bonds with clients.

Network Objectives
The Telecommunications Regulatory Authority (TRA) of Oman has likewise established aggressive targets for the nationwide coverage of high-speed fixed and mobile telecom networks. By the end of 2025, the TRA intends to ensure that all mobile network base stations are capable of supporting 4G and 5G services, covering 98% of the population.

Evolving More Autonomous and Optimized Operations

More and more businesses are looking to improve the autonomy of their mill or plant operations. An autonomous system in an autonomous mill or plant can monitor its own performance, which has various advantages such as enhanced safety and efficiency, lower costs and environmental effects, and less need for human involvement. However, even with autonomous and optimized operations, humans will continue to play a vital role, one that will focus more on supervising, controlling exceptions and ensuring that diverse process areas work well together.

Security, Dependability and Performance

Because the path to autonomous operations is a journey, shifting responsibilities will be gradual. And, in all autonomous operations, people will still play important roles in both tasks and incident remediation. Technological advances that support continuing employee needs in the short, medium and long term are critical. Two, in particular, are of key importance.

The first concerns alarms and process security. As mode-based alerts for units have developed, alarm administration, records and analysis have greatly evolved. Cross-unit or transitional alarm settings, however, are rarely employed.

Meanwhile, many standards continue to address functional safety as well as safety-instrument systems. It is

TELECOM Review

necessary to develop more robust operations by increasing closed-loop verification and identifying the need for safety element remediation, including sensors, valves and overall logic. Capturing such data and integrating it with the process control domain will be crucial to achieving more autonomous operations, whether it's valve and sensor verification or outcome notification.

The monitoring of process and equipment health and performance is the second area where considerable improvements could be made. Pumps, heat exchangers, compressors and filters, for example, have recently played a larger role in improving facility maintenance and process performance.

While individual pieces of equipment's health and performance are better understood and monitored today, the emphasis remains on single assets. The next stage in engineering oversight is to determine where the temperature of the entering fluid from an upstream exchanger flags an event to the pump and where a shortfall in the pump discharge head alerts a downstream reactor. These cross-asset discussions will ultimately determine autonomous engineering surveillance operations.

Remote and Resilient
As operator operations in the field are reduced, control center locations can be relocated away from the plant site. By transferring personnel from potentially hazardous environments and allowing them to focus on performance improvement rather than data collection and manual analysis, this enhances safety, productivity, and efficiency.

Even project activities, such as changes to control, safety, and security infrastructure, are increasingly being managed remotely, with minimal plant impact until the point of cut-over. This remote method is possible due to the design being decoupled from the real equipment and the use of universal input/output (I/O) technology, which

allows control cabinets and channels to be configured for any I/O function.

Remote abilities can also improve resilience. Remote monitoring and troubleshooting for control and safety system infrastructure can improve monitoring, speed up troubleshooting, and reduce the need for site visits. All of this remote assistance can be implemented with great levels of security.

At the same time, autonomous operations will necessitate durable plant infrastructure. Failures will still occur, but the system or process will continue to function normally and automatically recover.

On-site resilience has always relied on duplicate controllers taking over in the event of a failure. A problem triggers the backup. A second problem, however, will still cause an outage. True resilience requires the operation to continue even in the face of repeated failures until the process is exhausted.

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. Instead, they are put into a network of controllers that distribute control to wherever capacity is available.

Of course, this is merely the first step toward autonomous operations, which will appear in a variety of settings and across a wide range of activities and disciplines. Many, if not the majority, will find the road arduous. The journey, however, will be worthwhile, and firms will benefit from each step along the way.

Future of Autonomous Operations
Even on a modest scale, achieving autonomy in the process industries can provide benefits. Increased automation and domain application integration, for example, will decrease human error, offer continuous operations, and remove workers from remote or hazardous settings.

In the near to medium term, fully autonomous plants are improbable, but expect some functions to become autonomous to some extent depending on the application, demands, and cost-benefit ratio.

Most process firms operate at or below the Automated level of autonomy, but those at the Semi-Autonomous level may remain there for a long time even as technology, trust and workforce dynamics change. Human interaction and decision-making will continue to be important in many situations, but they will be further reinforced by industrial autonomy as plant workers learn to coexist with these important and increasingly necessary autonomous technologies. **TR**

Even with autonomous and optimized operations, humans will continue to play a vital role

Telecom Industry's Trinity:

Spectrum, Space and Sustainability

"The global management of radio frequency spectrum and associated satellite orbits is at the heart of ITU's strategic goals to achieve universal connectivity and sustainable digital transformation," according to ITU Secretary-General Doreen Bogdan-Martin.

In light of the rapid expansion of innovative digital services on a global scale, ensuring secure, dependable, cost-effective and inclusive connectivity has become imperative. Addressing sustainability in spectrum and space management is crucial for the long-term viability of our communication systems and space activities. As the demand for spectrum resources continues to rise and space exploration and utilization expand, it becomes essential to adopt sustainable practices to minimize environmental impact and ensure the responsible use of these limited resources.

In Dubai, UAE, the ITU World Radiocommunication Conference 2023 (WRC-23) is taking place with the aim of facilitating novel and advanced methods of global connectivity. This conference provides ITU Member States with a valuable platform to revise the Radio Regulations that govern the utilization of frequency spectrum and satellite orbits, enabling them to stay up-to-date with evolving technologies.

Let us first define the three main concepts concerning the telecom

industry: spectrum, space and sustainability.

Spectrum refers to the radio frequencies used for wireless communication. It is a finite resource, and its efficient allocation and management are vital for the telecom industry. Optimal spectrum allocation enables efficient network operations, reduces congestion and supports the rollout of advanced technologies like 5G.

Space is becoming increasingly important in the telecom industry due to the rise of satcoms and the need for reliable and global connectivity, particularly in remote areas and disaster-stricken regions. Efficient use of space, satellite positioning and collaboration among stakeholders are essential for expanding coverage and bridging the digital divide.

Sustainability is a critical focus in the telecom industry. Sustainable practices and technologies enable the telecom industry to support the growing demand for connectivity. This includes promoting renewable energy sources, implementing green network infrastructure and exploring innovative solutions like energy-efficient base stations and network optimization techniques.

Spectrum in Modern ICT

Key topics under consideration at the upcoming World Radiocommunication Conference include the identification of additional frequency bands to support the ongoing development of International Mobile Telecommunications (IMT). This includes exploring the potential use of high-altitude platform stations as IMT base stations for the universal deployment of wireless networks.

Regarding spectrum regulations, the six regional telecommunication organizations (RTOs) have worked extensively to produce well-coordinated proposals that align with their respective regions. These organizations are namely the Asia-Pacific Telecommunity (APT); the Arab Spectrum Management Group (ASMG); the African Telecommunications

Union (ATU); the European Conference of Postal and Telecommunications Administrations (CEPT); the Inter-American Telecommunication Commission (CITEL); and the Regional Commonwealth in the Field of Communications (RCC).

Implementing efficient spectrum allocation strategies will avoid spectrum congestion and wasteful use. These include utilizing spectrum-sharing techniques and dynamic spectrum access to optimize spectrum utilization.

In 2021, the value of spectrum allocations peaked at $140.1 billion. According to GSA's spectrum pricing report, the United States C-Band continues to hold the record for the most expensive spectrum in the overall landscape, followed by Taiwan's auction and Italy's mid-band auction. Yet on a global basis, operators are actually paying a higher average price for low-band than mid-band spectrum.

Establishing robust monitoring systems to detect and address spectrum misuse, interference and unauthorized transmissions is also achieved by collaborating with international entities to coordinate spectrum monitoring efforts and address cross-border interference issues.

In reality, the significance of the spectrum in modern ICT is profound and pervasive. It serves as the foundation for mobile networks, Wi-Fi, Bluetooth, satellite communications and numerous other wireless services. These technologies enable the transmission of voice, data and multimedia content without the need for physical wired connections.

Spectrum is essential for mobile network operators to provide cellular services. Mobile networks rely on allocated spectrum bands to transmit and receive signals between mobile devices and base stations. On the other hand, Wi-Fi uses unlicensed spectrum bands, allowing multiple devices to connect wirelessly to a local network and access the internet simultaneously. IoT devices also utilize various wireless technologies and spectrum bands to

transmit data, enabling applications such as smart home automation, industrial automation and smart city infrastructure.

Countries around the world are showing huge interest in increased spectrum allocation. The Cellular Operators Association of India, involving Reliance Jio, Airtel and Vodafone Idea, expressed that mobile service providers need 2 megahertz of frequency in the mid-band spectrum to enhance user experience and that the entire 1200 megahertz of frequencies available in the 6 GHz band should be reserved for them.

Moreover, the Independent Communications Authority of South Africa (Icasa) has published an amendment to its Radio Frequency Spectrum Regulations, effectively opening up the lower 6 GHz spectrum band for the provision of Wi-Fi services.

The availability of this extra spectrum enables a higher number of concurrent connections, reduces latency, provides faster data speeds and minimizes interference.

In preparation for the ITU WRC-23 scheduled for November, the GSMA has outlined the mobile industry's vision for optimizing the advantages of mobile spectrum on a global scale. The goals include enhancing mobile capacity to deliver improved services through cost-effective and sustainable networks, utilizing additional low-band spectrum to enable widespread and affordable connectivity for digital inclusion, and expanding mid-band frequencies to drive the implementation of city-wide 5G networks.

More importantly, spectrum availability and efficient allocation foster innovation and drive economic growth. It enables the development of new wireless services, applications and business models, supporting numerous industries such as telecom, e-commerce, digital media, healthcare and transportation.

Given the increasing reliance on wireless communication and the proliferation of connected devices, this

highlights the importance of effective spectrum allocation, spectrum sharing approaches and the continuous exploration of new technologies to address the evolving needs of modern ICT.

Growing Demand for Satellite

Sharing spectrum and orbital resources on an equal footing, and without unacceptable interference is key to meeting the world's growing demand for all types of satellite services.

Within ITU-R, the efficient use of radio-frequency spectrum and associated satellite orbits is considered by Study Group 4, both as part of ongoing activities and when considering agenda items for WRCs.

The upcoming WRC-23 will address topics related to satellite broadband communication on mobile platforms, such as aircraft and ships; discussions on improving the international regulatory framework for geostationary and non-geostationary satellites; and utilizing satellite technologies to enhance broadband services, particularly in remote areas.

However, the rapid development of new engineering solutions and services in satcoms often surpasses the enhancement of the international regulatory framework. As a result, situations arise where spectrum usage for new technologies occurs without relevant provisions in the Radio Regulations. This creates evident challenges for administrations in managing and regulating such activities.

Thus, investors, developers and operators of the systems and networks for terrestrial and space services need to be confident in the transparency, predictability and sustainability of international radio regulations.

There is actually a difference of opinion among experts regarding the global auctioning of the satcom spectrum, mainly because it is a shared resource and implementing an auction method may not be a feasible solution. The satellite spectrum, along with orbital slots, is utilized for cross-border

services, which makes the auction approach challenging as it cannot be assigned exclusively.

Globally, the allocation of satellite spectrum for right-to-use is primarily done through administrative processes. Attempts to introduce such auction-based approaches, as seen in the US and Brazil, have not been successful.

Relatively speaking, in the Arab States, the implementation of new earth station in motion (ESIM) systems in the Ku and Ka bands holds promise. However, concerns arise among countries in the region regarding the potential impact of these systems on existing incumbent services in those frequency bands.

In the Western region, the Federal Communications Commission (FCC) has recently approved unanimous rules to govern the coordination and sharing of spectrum for space-based systems. These rules aim to strike a balance between protecting early-mover systems and facilitating spectrum access for newer players. The establishment of the Space Bureau has played a role in these regulatory changes, marking significant progress in this area.

Regulatory certainty and simplicity are crucial for satellite networks as they facilitate the expansion of networks, encourage investment in innovations and guarantee uninterrupted service. Nations that streamline access to their territorial waters, seaports, airspace and airports for ESIMs will enable their citizens and visitors to fully utilize mobile broadband opportunities.

As an example, AT&T has submitted a regulatory request to lease its wireless spectrum to AST SpaceMobile, aiming to facilitate smartphone connectivity within the US through AST SpaceMobile's planned satellite constellation. The agreement entails the transfer of a significant portion of AT&T's low-band frequencies to address coverage gaps across the country.

As the number of satellites and space activities increases, there is a growing need for effective space traffic

management (STM) to avoid collisions and ensure sustainable use of space resources. Anticipated advancements include the development of STM frameworks and regulations that enhance coordination and information sharing among satellite operators and government entities. This may involve improved satellite tracking and collision avoidance systems, standardized communication protocols and regulations for satellite launches and end-of-life disposal.

Large-scale satellite constellations, like SpaceX's Starlink, have the potential to provide global broadband connectivity. Technologies like optical cross-linking between satellites can improve communication efficiency within the constellation, reducing the need for high-power transmissions and improving overall spectrum utilization.

Overall, advancements in spectrum and space management will play a crucial role in optimizing resource utilization, mitigating space debris risks and fostering responsible and efficient use of spectrum and space resources.

> Addressing sustainability in spectrum and space management is crucial for the long-term viability of our communication systems

Sustainability in Advancements

When it comes to sustainable spectrum management, dynamic spectrum access (DSA) enables the efficient sharing of spectrum resources by allowing secondary users to access unused or underutilized spectrum bands. By dynamically allocating spectrum based on real-time demand, DSA maximizes spectrum utilization while minimizing the need for additional infrastructure.

A proposal known as the Advanced Spectrum Initiative for Research and Experimentation (ASPIRE), currently in its early stages, seeks to create bandwidth availability through a project sponsored by the National Science Foundation (NSF).

Cognitive radio systems also use intelligent algorithms to identify and utilize available spectrum bands efficiently. These systems can sense the spectrum environment, detect unused frequencies and adaptively adjust their transmission parameters to avoid interference, ensuring optimal use of spectrum resources.

Apart from that, Software-Defined Radio (SDR) is a technology that enables wireless communication devices to reconfigure and adapt their operating parameters, such as frequency range and modulation schemes, using software. SDR allows for more flexible and efficient use of the spectrum by enabling devices to operate on multiple frequency bands and adapt to changing conditions.

Even beamforming and Massive Multiple-Input Multiple-Output (Massive MIMO) technologies improve spectrum utilization, increase capacity and reduce interference.

For underserved areas, white space can be beneficial. It is the unused or underutilized spectrum bands in the frequency range traditionally allocated to television broadcasting. By utilizing this unused spectrum, white space devices (WSDs) help increase spectrum efficiency and enable broadband access.

Governments and regulatory bodies can use spectrum auctions to allocate spectrum rights to the highest-value users. This encourages efficient spectrum utilization, as it incentivizes operators to deploy services and infrastructure that make the most productive use of the spectrum. In line with this, spectrum harmonization involves aligning spectrum allocation and usage policies across different countries or regions. By adopting common spectrum bands and technical standards, harmonization facilitates international roaming, economies of scale in equipment manufacturing and efficient utilization of spectrum resources across borders.

Regarding extra-terrestrial considerations, space debris poses a significant threat to operational satellites and future space missions. Thus, initiatives are in place to promote responsible space debris mitigation practices, such as designing satellites for controlled re-entry, limiting mission-related debris and implementing end-of-life disposal strategies to minimize space debris generation.

As satellite constellations also grow in number, managing their deployment and operations becomes critical. Initiatives promote responsible constellation design to minimize orbital congestion, collision risks and radiofrequency interference. Technologies like on-orbit servicing and active debris removal are being developed to address these challenges.

Developing sustainable propulsion systems for spacecraft is also crucial in order to reduce reliance on traditional chemical rockets, which are resource-intensive and produce significant emissions. Initiatives focus on advancing technologies like electric propulsion, solar sails and green propellants to minimize environmental impact and improve fuel efficiency.

For space missions, small satellites, or SmallSats, offer a more sustainable approach. They are lighter, require less energy and can be launched in clusters, reducing costs and environmental impact. SmallSats enable a wide range of applications, including Earth observation, communications and scientific research.

There are also initiatives exploring the concept of in-space manufacturing and recycling to reduce the need for launching materials from Earth. Technologies like 3D printing in space and utilizing local resources, such as asteroid mining, can help minimize waste, extend mission lifetimes and promote sustainable space activities.

Conclusion

Overall, spectrum management, space utilization and sustainability are priorities within the telecom industry to ensure efficient communication networks, widespread connectivity and responsible resource management. By addressing these primary aspects, the industry can meet the evolving demands of users while minimizing its environmental impact and driving sustainable growth. **TR**

> Spectrum availability and efficient allocation foster innovation and drive economic growth

Top Technology Trends for 2023

The evolution of technology is powerful. It compels us to reset our cognitive capacities to keep pace with it; otherwise, we risk getting left behind in the digital-first world.

Time has favored early adopters of technology in almost all spheres of business, be it retail, agriculture, finance, healthcare and so on. Telecoms have been central to this dynamic environment and must always be a step ahead in their matters.

The year 2023 has been like no other year before it, with unprecedented expansion and ambition in ICT. However, only time can tell if the technology trends below can turn it into a year to remember — one with the potential to transform business models and the ICT sector as a whole.

Ubiquitous Cybersecurity: Given the diverse aspects of the ICT industry's operations, maintaining steady control over cybersecurity breaches has baffled the best of security professionals. Experts cite the lack of Zero-Trust architecture deployments in organizations as a challenge to enterprise security. A recent study by Cisco Talos also showed that 30% of security breach incidents either did not have multi-factor authentication (MFA) processes in place or featured them only on select services. It is understandable to see such gaps given the variables in every organizational priority. Hence, Huawei Middle East CSO Aloysius Cheang reiterates his company's belief in the principles of people, process and technology and developing a synergy among them for better security operations. As unnerving as it may sound, cybersecurity issues are here to stay. As attackers get more and more sophisticated, organizations must scale their protection strategies by leveraging advanced technologies like automation, machine learning and

predictive intelligence to run through data in real-time and tackle potential threats in advance. Telcos are well-positioned to provide critical guidance to their customers, as they have the data at their disposal to develop the best possible defense mechanisms.

Industrial Internet: Today's industries are going through massive changes. Although technology has led many to lose their jobs, it has also freed manual labor from dangerous, even life-threatening, operations. The Industrial Internet of Things (IIoT) involves the use of smart sensors and actuators to enhance manufacturing and industrial processes. A prime example of this technology in use is at China's first intelligent iron mine, the Yanqianshan Iron Mine, where huge unmanned drilling machines and iron ore extraction trollies are operated 300 meters underground. Using a console and joysticks from the safety of a control room, the miners here are able to carry out their mining operations with greater efficiency and safety. Huawei provides the underground Wi-Fi6 connectivity that allows uninterrupted data transmission from above and below to facilitate remote operations. The company's data center, built in collaboration with Huawei, works as the brain of the entire system, supporting real-time monitoring and intelligent management across the entire mine. With its potential to simplify industry operations, this technology is poised for rapid adoption across the industrial and manufacturing sector. Similarly, Nokia and Ericsson are closely working with various industrial sector companies across the MENA region with their innovative solutions designed for seamless industrial integration.

Edge of AI: From collecting data on grouping of fishes in the ocean using portable submarines to generating human-like content using prompts, we have seen what artificial intelligence is capable of and are blown away by its potential. AI is up for grabs, and everybody wants to rub this magical lamp to see what might appear.

"Integrating AI technologies into telecommunications strategies started a few years back and has [now] started

to reap the benefits, which are many," says Jay Srage, head of operations at the Michigan Ross School of Business in MEA and managing director at Centrigent Consulting DMCC. According to Srage, AI has brought on significant change mainly in four areas: improving customer experience by analyzing customer data to personalize services; optimizing network performance by monitoring traffic patterns, predicting failures and dynamically allocating resources; predictive maintenance by analyzing real-time data to detect anomalies and identify faults; assisting in network planning and expansion by analyzing usage data and population trends; and so on. Many sectors, such as healthcare, education, entertainment, logistics and fintech, among others, are primary markets for AI deployments. Both government and private entities have set aside adequate budgets to cash in on this emerging technology, albeit while anticipating a host of regulatory roadblocks along the way.

Big Data and Statistics: As a wise saying goes, "information is power." And in the world of big data, such information has inflated exponentially, constituting a proverbial modern-day gold mine. Businesses are fine-tuning their offerings based on the data input of their customers' behavior patterns, buying habits, etc. However, recent studies show that around 80% of data generated today is unstructured data — data that is not actively managed in a transactional system such as a relational database management system (RDBMS). Only about 3% of companies have been able to fully harness information from big data. Moreover, with the advent of technologies such as cloud and edge computing, the big data analytics market is projected to reach a jaw-dropping $103 billion by 2027, and telcos are, in essence, sitting atop it.

Green Networks: Leading ICT industry organizations such as ITU and GSMA have been relentlessly advocating for "greener networks" in the hopes of achieving a significant reduction of the environmental impacts of the ICT sector. ICTs contribute around 2 to 2.5% of global greenhouse gas (GHG) emissions. However, ICTs are also well

positioned to assist other sectors of the economy in reducing carbon emissions. With a host of initiatives, they aim to limit global warming within a 1.5°C target set by the ITU Recommendation ITU-T L.1470, compatible with the UNFCCC Paris Agreement. As per the International Energy Agency's (IEA) forecast, the growing use of residential ICTs and consumer electronics goods will triple electricity consumption by 2030 if no action is taken to improve their efficiency. Making network infrastructure power-aware and energy-efficient is being seen as an important step towards reducing the energy footprint in the ICT sector. Modern telcos must pay attention to green development in ICT and come up with innovative solutions to achieve their eco-friendly goals as the number of investors sensitive to climate change continues to steadily rise. ℡

> The evolution of technology is powerful. It compels us to reset our cognitive capacities to keep pace with it

AI and Business: Creating the Future Together

Technology has changed most every aspect of how we behave, communicate, socialize, entertain ourselves and operate our businesses — indeed, how we live our lives. The advent of emails, instant messaging, websites and applications has made global communication more effective than ever. Advanced collaboration tools have made internal and external communication easier, as exemplified by their profound impact during the coronavirus pandemic.

In fact, technology has influenced business in countless ways. For example, it improved businesses' efforts toward external customer services as well as individualized attention. Mobile technology, in particular, has replaced the laptop as the go-to facilitator of such services. However, the emergence of Artificial Intelligence (AI) has completely transformed the business landscape and the workforce. This begs the question: How does AI impact the shape of businesses and the workforce?

Different Types of AI

As business owners or employees, we interact with AI daily, often without realizing it. This technology has broken from the confines of the two-dimensional screen and entered the three-dimensional physical environment surrounding us. In fact, 90% of leading businesses already have ongoing investments in AI.

Machine Learning is one of the most common forms of AI used in business development today. It relies on algorithms and has the potential to rapidly process vast amounts of data. Deep Learning is another part of the AI family, one based on neural networks and nonlinear reasoning. This platform is becoming increasingly independent and likely to be utilized more often.

Common Uses of AI in Business

To understand more about how AI is impacting business, let's dive into its standard applications. When we talk about data, we inevitably think about machine learning. As mentioned earlier, this technology   enables companies to capture and analyze huge amounts of data.

In addition, AI plays a crucial role at the security level. When it comes to network defense, AI leverages data patterns to trace the source of cyberattacks and threats. Due to their complexity, these problems are becoming ever more challenging for cybersecurity experts to detect and solve efficiently.

Customer relationship management (CRM) systems are also impacted by AI.

Some software programs used to rely heavily on unreliable human intervention. Nowadays, however, AI can help facilitate these more dependable self-updating and autocorrecting systems.

Moreover, for internal operations, AI can serve as a personal assistant, managing emails and calendars as well as customer calls or online chats. With AI handling these small tasks, business owners and employees have more time to focus on growth strategies for their businesses.

Given such productive support, it's no wonder AI has grown by an astonishing 270% in the last four years.

Impact of AI on the Workforce

What was considered impossible in the past has become the new reality today thanks to AI, whose key success lies in clean data and fast processes. However, employees are understandably concerned as to whether or not this technology will force them out of work. Here, two expert perspectives emerge. The optimistic view suggests that with AI, the focus will shift toward business advancement, creating more specialized jobs and tasks. The pessimistic perspective, on the other hand, argues that AI will automate many jobs, leading to the complete robotization of industries.

However, humans do possess a generalized intelligence not yet known to their AI counterparts. Skills like problem-solving, abstract thinking and critical judgment remain essential for businesses and, indeed, cannot be replicated by advanced technologies or AI. Human judgment will remain relevant, if not in every task, certainly across all sectors. One thing is certain, however: technology is shifting roles and responsibilities across the business landscape.

AI Taking Shape in the Future

For many of us, AI conjures up scientific fantasies or fears about robots taking over the world. But the truth is that AI has already found a wide range of practical uses in various industries and is undeniably a part of the future.

In fact, 71% of all job openings in the next five years are expected to be in the field of AI and machine learning.

Along with the Internet of Things and advanced technologies, this platform will reshape the world and transform the economy. It will drive progress in all sectors, providing startups with the tools to thrive and enabling the widespread adoption of various business applications. While it may indeed lead to the displacement of certain jobs, it will certainly create new ones. Though its exact impact remains to be seen, AI is here to stay, whether we like it or not.

So you might as well seize the opportunity to enhance your career, make your professional profile more competitive in the job market, and seek opportunities to up skill. The time is now to take the initiative to explore Artificial Intelligence and its benefits. TR

> The emergence of Artificial Intelligence (AI) has completely transformed the business landscape and the modern workforce

Huawei Unveils Groundbreaking Advances in 5G Intelligent Core Networks

stc Group, the digital enabler in the region, announced the collaboration strategy today, which includes a partnership with Huawei to build the industry's best cloud infrastructure and deliver the highest service experience to its end users.

This cooperation with Huawei is part of the evolution of Intelligent Telecom Network O&M and the agile network architecture. The first CDCT (Continuous Delivery Continuous Testing) Validation under Telco cloud

Partnership program in KSA was completed via stc lab capabilities, which accelerates the 5G Standalone Core vision of an optimized telecom network architecture with intelligent operation and maintenance.

stc completed the 5G Core Network Functions automatic upgrade test case with the Huawei MBB Autonomous Engine (MAE) solution and associated team. This signifies a giant step taken forward under the stc Network Cloudification and Automation Strategy that aims to support Saudi Arabia's vision of economic diversification in 2030. The stc strategy aims to deploy an agile cloud-native, next-generation platform, including 5G edge computing and convergent and digital networks, through a sustainable, shortened TTM and optimized TCO approach. As the first practice of the CDCT use case validation project in KSA, stc Group demonstrated VNF/CNF

onboarding and upgrading scenarios with a cloud detector — a simulator to perform automatic function test cases, thus successfully achieving O&M transformation from the NE-centered manual mode to the service-centered adaptive mode.

The traditional network functions upgrade mode brings challenges to core network O&M mechanisms and to network security. As the digital enabler in the region, stc Group has always been focused on innovation and evolution. By exploring the concept of ADN (autonomous driving network) with Huawei, an advanced automatic workflow engine is introduced to orchestrate automation capabilities, such as agile service onboarding and tools, for quickly implementing automated process orchestration in scenarios such as NE upgrade, capacity expansion, scaling, and reconstruction.

ZainTech, Mastercard Partner to Deliver Data Solutions to Enterprise Clients

ZainTech, the one-stop digital solutions powerhouse of Zain Group, has signed a memorandum of understanding (MoU) with Mastercard to create unique data-driven and innovative solutions for businesses across the Middle East and North Africa (MENA). The partnership will help streamline clients' operations, including enhancing productivity and cost savings.

ZainTech and Zain B2B teams across the region are revolutionizing day-to-

day business by streamlining their digital transformation journey, making it simpler and more seamless than ever before. The company is offering cutting-edge data solutions, facilitating digital and data-driven decision-making, to achieve clients' corporate goals and drive growth.

Commenting on the collaboration with Mastercard, Andrew Hanna, ZainTech CEO, said: "The benefits of sophisticated data to productivity, safety and cost savings being driven by AI and machine learning are revolutionizing business processes. This partnership with Mastercard will catalyze the development of unique data solutions from which our enterprise clients will benefit directly."

Amnah Ajmal, executive vice president, market development, Eastern Europe, Middle East and Africa, Mastercard, said: "Artificial Intelligence has

become an essential part of building cutting-edge solutions that use data to deliver added value to end-users. We are delighted to support ZainTech, a leading regional digital solutions provider, in strengthening its value proposition."

The MENA region is witnessing an acceleration in the application of big data analytics, which is transforming industrial and enterprise operations. According to advisory firm PwC, the potential contribution of AI to the global economy will peak at almost US$16 trillion by 2030, and the Middle East is expected to accrue approximately 2% of those benefits, equivalent to approximately US$320 billion.

Through its collaboration with Mastercard, ZainTech anticipates an accelerated adoption of advanced analytics, AI and machine learning across the MENA region.

Huawei Opens State-of-the-Art Office in Qatar With Sights Set on Digital Future

In line with its expansion plans in Qatar and its commitment to support the country's digital transformation, ICT ecosystem and digital economy, Huawei opened a new state-of-the-art Qatar office in the UDC Tower, The Pearl Island, Qatar.

The new 4,000-square-meter office will house Huawei's main Qatar operation team and will help meet the future needs of the company's growing workforce. The move reaffirms Huawei's long-term commitment to Qatar and is a milestone in the company's expansion plan targeted at enhancing its presence, activities, offerings and contributions to the Qatar market to achieve its mandate to play a key role in achieving the country's digital transformation goals.

The new office inauguration was attended by His Excellency Mohamed bin Ali Al Mannai, Minister of Communications and Information Technology, and senior representatives from the Investment Promotion Agency of Qatar (IPA Qatar), United Development Company (UDC), Embassy of the People's Republic of China in the State of Qatar and the Huawei management team led by Steven Yi, President, Huawei Middle East and Central Asia.

Commenting on Huawei's new office opening, H.E. Mohamed bin Ali Al Mannai said: "Huawei is considered one of our important partners and is among the top leading companies in the field of information and communication technology. I am pleased to welcome Huawei's new expansion in Qatar. There is no doubt that this will contribute to enhancing digital innovation and creating new digital opportunities in the Qatari market."

Steven Yi, President, Huawei Middle East and Central Asia, said: "Today's new office opening is a commitment to our future in Qatar. We are proud of our history in the country, and Huawei will continue to support Qatar's digital transformation through its cutting-edge technology solutions. I look forward to welcoming customers, partners, visitors and Huawei team members to our new office. I am confident that this expansion will drive further recruitment of elite talent who will take the lead in achieving the goals of the Qatar National Vision 2030, towards a leading sustainable digital society."

Huawei's new office will host the company's business operations, including Carrier Networks, Enterprise, Consumer, Cloud and Digital Power. In addition, the new office will play a critical role in managing the company's CSR programs and initiatives in Qatar, such as Huawei's flagship program, Seeds for the Future, the annual ICT Competition and the ICT Academy. The new office will also host an exhibition center that will function as an executive briefing center, showcasing many of the company's products, solutions and advanced technologies in the ICT industry.

Nokia Breaks mmWave Extended Range 5G Speed Record

Using millimeter wave (mmWave) spectrum and 5G Fixed Wireless Access (FWA), Nokia has announced it sustained average downlink rates of over 2 Gigabits per second (Gbps) across a distance of 10.86 kilometers.

At the OuluZone test site in Oulu, Finland, Nokia's 5G extended range mmWave solution was used to achieve this milestone download speed, the fastest recorded globally to date.

Nokia's FastMile 5G PoC CPE (customer premises equipment) and AirScale baseband and 24 GHz (n258 band) mmWave radio were used in the test. In the downlink, testing used eight component carriers (8CC) to combine 800 MHz of mmWave bandwidth. This made it possible for an uplink speed of 57.2 Mbps and a maximum downlink speed of 2.1 Gbps.

This accomplishment illustrates the range and communication speeds that 5G mmWave can offer and builds on a prior world record declared by Nokia in 2021. It also lays the groundwork for providing top-notch FWA connectivity options to locations where wired connections aren't always feasible.

Nokia's FastMile 5G PoC CPE (customer premises equipment) and AirScale baseband and 24 GHz (n258 band) mmWave radio were used in the test. In the downlink, testing used eight component carriers (8CC) to combine 800 MHz of mmWave bandwidth. This made it possible for an uplink speed of 57.2 Mbps and a maximum downlink speed of 2.1 Gbps.

This accomplishment illustrates the range and communication speeds that 5G mmWave can offer and builds on a prior world record declared by Nokia in 2021. It also lays the groundwork for providing top-notch FWA connectivity options to locations where wired connections aren't always feasible.

Nokia Signs Long-Term Patent License Agreement

A new patent cross-licensing agreement that Nokia has signed with Apple will replace its current licensing arrangement, which is due to expire at the end of 2023. The parties have jointly committed to keeping the terms of the agreement private.

President of Nokia Technologies Jenni Lukander stated: "We are pleased to have reached a long-term patent license deal on amicable terms with Apple. The deal is a testament to Nokia's robust patent portfolio, long history of R&D investments and contributions to the development of other technologies such as cellular standards.

Beginning in January 2024, Nokia anticipates recording the revenue associated with this new patent license deal. The agreement is in line with the presumptions Nokia disclosed in the information regarding the long-term forecast for Nokia Technologies specified in its first-quarter financial report released on April 20, 2023.

Nokia's industry-leading patent portfolio is built on more than €140 billion invested in R&D since 2000 and is composed of around 20,000 patent families, including over 5,500 deemed essential to 5G. Nokia contributes its inventions to open standards in return for the right to license them on fair, reasonable and non-discriminatory (FRAND) terms. Companies can license and use these technologies without the need to make their own substantial investments in the standards, fueling innovation as well as the development of new products and services for consumers.

Fortinet Brings Flexible Licensing to FortiFlex Program

Fortinet, the global cybersecurity leader driving the convergence of networking and security, has announced new product and service additions to its FortiFlex program, delivering flexible licensing options to customers. FortiFlex already includes a complete suite of virtualized solutions for protecting cloud and virtual data center deployments and now supports services for physical FortiGate next-generation firewall (NGFW) appliances. FortiFlex is also available via a private offer in AWS Marketplace as an additional purchasing option.

John Maddison, EVP Products and CMO at Fortinet, said, "The solutions organizations deploy today are becoming more flexible to support highly distributed users and applications. Licensing models should be just as flexible. That's why we're excited to expand our FortiFlex program to give customers more licensing options to utilize Fortinet solutions and services according to their evolving needs."

With highly distributed users accessing highly distributed applications and a growing number of edges, networks are evolving at an unprecedented rate. IT teams are often expected to procure and deploy solutions before they have a full understanding of their needs — and those needs frequently change. Flexible licensing programs allow organizations to pay by usage. While there will always be a need for traditional product licensing models, usage-based pricing offers customers an additional way to leverage the solutions they need and adapt to their businesses dynamic needs.

FortiFlex offers usage-based licensing for a wide range of Fortinet's cybersecurity solutions across cloud, hybrid cloud, and on-premises deployments. It uses a points system that makes it easy to understand available balance, usage trends and total spend. Organizations are charged in 24-hour periods to give IT teams the flexibility to right-size their deployments each day.

Customers can use points to deploy any mix of cloud and virtual machine offerings, as well as services for on-premises deployments. They can even leverage budget committed to select cloud providers — including Google Cloud and AWS — to purchase FortiFlex points.

These features allow organizations to leverage FortiFlex in a variety of ways, including:

- Reducing excessive procurement cycles for new security solutions
- Simplifying the deployment and provisioning of new services through FortiFlex's powerful APIs
- Maximizing budget and return on investment (ROI) by scaling down or pausing services as needed
- Optimizing cloud spend by utilizing "use it or lose it" dollars committed to cloud providers to purchase FortiFlex points that can be redeemed in the future

Managed security service providers (MSSPs) can also use a single FortiFlex account to pool licenses across their entire customer base to easily migrate and reassign licenses with ease, allowing MSSPs to address their customers' needs without worrying about overbuying — all from a single interface.

FortiFlex now includes FortiGuard AI-powered Security Services and FortiCare technical support for the FortiGate NGFWs. Backed by a single operating system, FortiOS, and a unified management console, FortiManager, all FortiGate NGFWs support hybrid mesh firewall — a security architecture that protects multiple areas of enterprise IT by coordinating threat intelligence and security policies across firewalls.

How Cloud Technologies Can Help Low-Carbon Industries Transition Quicker

The path to net-zero carbon is no longer a dream. Business leaders in several European nations believe that cloud technology will shorten the time to reach net-zero carbon emissions by two years or more, according to recent research. But exactly how can cloud technologies help low-carbon industries switch so quickly?

According to the UN World Commission on Environment and Development, sustainable development addresses the needs of the present without conceding the ability of future generations to meet their own needs.

Despite the overwhelming, even terrifying, problems posed by climate change, the actions we must all take to maintain our planet's ecological balance, strengthen our resilience, and prosper also offer us new and enormous economic opportunities. Many corporate leaders now have two main objectives: to modernize operations by utilizing more digital tools and to build a more sustainable society.

How Organizations Are Managing This Transition

For this, a study was conducted in four European countries: the UK, Spain, France and Germany. It surveyed 4,000 firms across three sectors: manufacturing, energy and utilities and financial services.

According to the statistics, 80% of organizations in all industries currently track their carbon footprint, and 96% of them have set emission reduction goals to lessen their impact. Although there are discrepancies between this confidence and the stated levels of achievement, 75% of European businesses say they are confident in attaining their sustainability targets.

The report noticed that decarbonization is now a top concern for many businesses, and with the amount of data growing both within and between organizations, efficient data management and cloud integration are becoming more crucial. Digital's role in the decarbonization process cannot be understated.

Only 14% of corporate executives have decarbonization goals that are supported by research. Businesses lack the tools needed to accurately quantify pollution. Unsurprisingly, Scope 1 emissions from direct operations, like burning fuel to support activities,

and Scope 2 emissions, like purchased energy, are simpler to assess and are recorded by 76% of businesses. Only 9% of companies make an effort to calculate Scope 3 emissions, also known as value chain emissions, which frequently account for the majority of an organization's overall GHG emissions.

The Technology to Accelerate Net Zero

According to respondents, digital technologies can bridge the gap between what companies expect their operations to look like and their expectations for sustainable business practices. 75% of business decision-makers acknowledge the role of technology in decarbonization and believe an emissions assessment tool would enhance their environmental impact reporting.

Expressively, 77% of CEOs think cloud technologies will shorten the time it takes to reach net zero by two years or more. IoT, digital twins and simulation drive operational efficiencies, and cloud-enabled innovation results in new business models, products and services aimed at achieving sustainability goals. Data combined with machine learning and artificial intelligence also provides new insights into customer behavior. DSM Animal Nutrition & Health in the

> Cloud-enabled innovation results in new business models, products and services aimed at achieving sustainability goals

> **The best approach for businesses to genuinely become more sustainable is to advance in the digital revolution**

UK, for instance, adopted the cloud quickly. This served to further their goal of creating bioscience solutions to enhance both human and animal health and lower carbon emissions. Sustell was developed in collaboration with Oblivion Cloud Control, an AWS Premier Partner. Sustell is a system that classifies data measurements of things like carbon emissions, climate effects, water use and air pollution using AWS technology. Additionally, their approach mimics scenarios so that farmers can track their environmental impacts. Farmers have been able to do this by analyzing which animal feed has the lowest carbon footprint, for example, to enhance their practices in terms of sustainability and production.

Despite the cloud's ability to foresee the future, just around one-fifth of organizations have done so. Some business executives may be just now becoming aware of how closely related technology and sustainability are. It is insufficient to firmly place carbon reduction on the boardroom

agenda. If we want to meet our deadlines, we need to use practical, efficient and accurate digital technologies like those provided by AWS and our partner Atos. The best approach for businesses to genuinely become more sustainable in support of Europe's green transition is to advance in the digital revolution.

In light of this, one of the largest technology firms that participated in the Climate Pledge in 2019 said: "A pledge to achieve net zero emissions by 2040 [is] ten years sooner than the Paris Agreement. Since then, more than 400 companies have signed the Climate Pledge.

"We are all aware that signing a pledge is just the beginning of implementing change. The first step on this journey is to understand where we are and what we can improve. We all need a clear grasp of our carbon emissions; we need to understand the obstacles to decarbonization; and we must have clarity on what to prioritize." **TR**

Nokia Announces High-Gain 5G Fixed Wireless Access for Underserved in North America

Nokia has announced the release of a specially designed Fixed Wireless Access receiver for the North American market.

The Nokia FastMile 5G receiver is the best option for underserved suburban and rural locations since it uses a high-gain antenna to deliver high speeds over long distances.

The receiver supports a broad range of 4G and 5G bands, including CBRS in either 4G or 5G as well as c-band. It also supports up to 4CA NR carrier aggregation, meaning operators can bundle bands for higher throughput.

The necessity for high-speed broadband has never been clearer, and governments are responding with a wide range of programs to ensure access for their citizens. Full coverage will require a combination of fiber and wireless technologies where it is too difficult to lay fiber.

The FastMile 5G receiver is mounted outside the home where it can pick up the strongest signals, which is important in rural areas where signals can be weak at the cell edge. The outside receiver is teamed with an inside Wi-Fi router, such as Nokia's Beacon G6.2, which has managed mesh Wi-Fi capability to deliver strong signals throughout the home.

Chris DePuy, technology analyst and Founder at 650 Group, said: "For those that require unlicensed spectrum, the 5G outdoor FWA device supports CBRS (B/n48), enabling CBRS in both 4G and 5G. We think the market has well over 10 million users for rural access that uses either unlicensed or licensed spectrum. This new product brings much-needed speed to rural areas that traditionally need to settle for less. Also, it broadens out Nokia's portfolio to allow it to serve a broader set of customers."

AWS Expands Further in Central Eastern Europe

Amazon Web Services (AWS) continues to invest in Hungary to support a growing number of AWS customers and partners moving to the cloud.

In June 2023, AWS opened its first office in Budapest as part of its ongoing investment in Central Eastern Europe. The hyperscaler's new office space will help teams better support organizations of all sizes in Hungary, including start-ups, enterprises and public sector organizations, as they make the transition to the AWS Cloud.

"After seeing increased customer adoption of AWS, we decided to open an office in Budapest to support customers who are looking to use AWS to innovate and lower their information technology costs, and grow their organizations in the cloud," said AWS Central and Eastern Europe General Manager

Przemek Szuder. "We look forward to helping even more organizations accelerate their digital transformations and deliver innovative new products and services to Hungarian customers and citizens."

The expansion follows the launch of an AWS edge location in Budapest in January 2020. With the edge location, AWS provides its Hungarian customers with advanced technologies such as Amazon CloudFront, a content delivery network service; AWS Shield, which safeguards applications running on AWS; and AWS WAF, which protects web applications from common exploits.

The AWS edge location connects Hungary to the AWS global infrastructure network, improving the secure delivery of content to customers in Hungary by more than 50%.

Huawei: Building Trustworthy Data Infrastructure for Carriers

Carriers have been at the forefront of the digital transformation over the past few years. The introduction of cloud services, B-to-B (business-to-business) technologies, and video streaming has created new growth potential for carriers. However, these new services place greater demands on IT infrastructure. Efficient data training, cost-effective data storage, and robust data resilience have all emerged as key challenges for carriers, particularly as the threat of ransomware grows.

During his keynote speech at the Huawei Product & Solution Innovation Launch at MWC Shanghai 2023, Peter Zhou, President of the Huawei IT Product Line, highlighted Huawei's vision of building a more trustworthy data infrastructure for the carrier industry.

While the boom of the digital and intelligent era is fast approaching, it has brought forth new challenges for carriers in their data infrastructure construction.

Mr. Zhou said, "Massive unstructured data enters the production decision-making system, causing explosive data growth. Data resilience risks caused by human factors are becoming more and more serious." Huawei highlights five major challenges: managing multi-cloud ecosystems; the expansion of generative AI; cloud business; cross-cloud data scheduling and ransomware threats. Addressing these difficulties necessitates the use of innovative solutions and technologies.

Ericsson: Better Connectivity Creates More Resilient Societies

The Conference of Montreal, one of the largest and most established economic conferences in North America, held its 2023 edition under the theme "Thriving in a World in Transition," featuring high-level speakers including Börje Ekholm, president and CEO, Ericsson.

"In our rapidly changing world, 5G is supporting millions of people, enterprises and economies in numerous ways. It was, therefore, a pleasure to attend the Conference of Montreal and discuss solutions to some of the planet's biggest challenges with distinguished guests, including representatives of the Government of Canada," said Ekholm on his LinkedIn post.

Ekholm addressed the Opening Partners' Luncheon, where the main topic focused on how to remain competitive in an era of digitalization.

Giving an example of how a 10% increase in mobile broadband adoption can increase economic growth (GDP) by up to 0.8%, Ekholm emphasized how, against the backdrop of increasing global fragmentation, better connectivity has a powerful role to play in creating more resilient societies. And there are even greater potential benefits for low-income countries.

Connectivity is essential for tackling the climate crisis, improving access to education and new skills, and bridging the digital divide. "Governments must work together with the private sector to lay the foundation for a brighter future, and, as I've said before, digitalization is the closest thing we have to a silver bullet.

MWC Shanghai 2023: Unleashing the Digital Dividends of 5G

With the rapid deployment and adoption of 5G technology, the digital economy holds tremendous potential for all sectors and industries and endless possibilities for new revenue and economic growth.

Building on Huawei's deep expertise in 5G advancement, Li Peng, Huawei's Corporate Senior Vice President and Carrier BG President, delivered a keynote titled "Creating New Value with 5G to Unleash Digital Dividends" at MWC Shanghai 2023 on June 29.

In his speech, Li Peng underscored the clear advantage of the early 5G adopters in the carrier market, noting that the Average Revenue Per User (ARPU) for the top 20 carriers ranked by the number of 5G sites had increased by 10% in recent times. He said that in addition to spearheading development in the digital industry, 5G is also enabling the digitalization of all industries.

"In the future, the new business scenarios for people, homes, businesses and vehicles will deliver new experiences. This will raise higher requirements for network capabilities. Enhanced network capabilities, like 10 Gbps downlink, 1 Gbps uplink and 100 billion IoT connections, will create a vast market space in 5.5G for carriers," Li explained.

EXA Infrastructure Names Nick Read as New Chairman

EXA Infrastructure, the largest dedicated digital infrastructure platform connecting Europe and North America, announced Nick Read as its new Chairman, to support the execution of EXA's strategy to become the undisputed leader in the pan-European and trans-Atlantic data center to data center connectivity business.

Nick is an accomplished and highly skilled business leader with over 20 years of telecom industry experience, most recently as the Group Chief Executive Officer of Vodafone. With a deep understanding of the global telecoms markets and its future evolving needs, Nick will help drive EXA's strategic network expansion plans, commercial growth and ongoing operational excellence efforts.

EXA Infrastructure, Chief Executive Officer, Martijn Blanken said: "Nick is a titan in our industry and I am convinced that his extensive leadership and technology experience will be invaluable to execute our ambitious growth strategy. His track record in business performance and transformation will be a welcome addition to guide EXA's executive team. I am delighted to see Nick join us and I look forward to working closely with him."

On being appointed Chairman of EXA Infrastructure, Nick Read said: "It is a privilege to be appointed Chair of EXA Infrastructure, particularly at a pivotal time for the telecoms industry where we are seeing significant investment in digital infrastructure and market growth. I look forward to working with the EXA leadership team who have a clear focus and commitment to customers, network excellence and continual investment to provide the most compelling experiences to clients and end users."

I Squared Capital acquired EXA's European, subsea and North American network infrastructure and data center assets owned by GTT in September 2021.

FCC Launches New Privacy and Data Protection Task Force

FCC Chairwoman Jessica Rosenworcel announced the establishment of a new Privacy and Data Protection Task Force. This FCC staff working group will coordinate across the agency on the rulemaking, enforcement and public awareness needs in the privacy and data protection sectors. This will include data breaches – such as those involving telecommunications providers and related to cyber intrusions – and supply chain vulnerabilities involving third-party vendors that service regulated communications providers.

"We live in an era of always-on connectivity. Connection is no longer just convenient. It fuels every aspect of modern civic and commercial life. To address the security challenges of this reality head-on, we must protect consumers' information, ensure data security, and require cyber vigilance from every participant in our communications networks," said Chairwoman Rosenworcel. "This team of FCC experts will lead our efforts to protect consumer privacy."

The new Task Force is made up of FCC staff from across the agency that handle topics including enforcement, equipment authorization, data breach reporting requirements and undersea cables.

ICT Ministers Hold Discussions on Strengthening Cooperation in the Sector

The Minister of Communications and Information Technology, Amr Talaat, and the Algerian Minister of Post and Telecommunications, Karim Bibi Triki, held extensive discussions about enhancing cooperation between Egypt and Algeria in ICT.

The two ministers discussed strengthening partnerships and exchanging experiences between Egypt and Algeria in related fields. They also reviewed the most prominent proposed areas of cooperation between the two countries, including telecommunications regulation, cybersecurity, digital transformation, postal services, capacity-building, innovation and entrepreneurship, and the establishment of business partnerships.

The two ministers also led an extensive meeting in the presence of senior officials from Egypt and Algeria. The meeting delved into reviewing the Digital Egypt strategy and the strategic projects of the Algerian Ministry of Post and Telecommunications (MPT).

During the meeting, the ICT Minister underlined the deep, distinctive, and vast range of bilateral ties between the two countries. He pointed out that MCIT-MPT cooperation varies as they agreed to promote and boost the ICT sector at the forefront of the growing sectors between the two brotherly countries by opening horizons for cooperation in post and information infrastructure. This is in addition to exchanging ideas about success stories in regulating the ICT sector, increasing investments in data centers and both achieving integration between data centers as well as international communications between the two countries.

Talaat explained that two new submarine cables are to be established to connect Egypt and Algeria by 2025, bringing the total number of cables connecting the two countries to four. He added that the two countries agreed to cooperate in encouraging youth to establish startups, commending the Algerian experience in this field.

How Did Telecom Vendors Perform Across Regions in Q1 2023?

In an exclusive three-part series, Telecom Review presents key insights into the benchmarks of the leading telecom vendors' carrier and enterprise business operations.

In this final part, we delve into the region-wise performance of Cisco, Ericsson and Nokia, based on comprehensive data gathered from Twimbit's analysis titled "Q1 2023 Telecom Equipment Vendor Performance Benchmarks."

Cisco
Cisco witnessed robust double-digit growth across all regions, with the Americas experiencing a 13% increase, EMEA growing by 16% and APAC seeing an 11% rise. The growth in the Americas was driven by a surge in service revenue, while strategic partnerships with telcos in India contributed to the APAC growth, particularly in the rollout of 5G.

Ericsson
While facing challenges in the Americas and EMEA regions, Ericsson achieved an exceptional 62.3% revenue increase in APAC. The noteworthy growth of 138% in Southeast Asia, Oceania and India can be attributed to significant market share gains in the 5G sector in India, as well as successful project milestones in the Philippines and Malaysia.

Nokia
In Asia Pacific (excluding India and China), Nokia experienced a 9% decline in performance, primarily driven by declines in Mobile Networks and Cloud and Network Services, particularly in Japan. Additionally, Greater China reported a 14% decline, mainly impacted by Mobile Networks. Nevertheless, the growth in India successfully counterbalanced the decline for Nokia in the APAC region.

Digital Transformation Forum 2023

Telecom Review is the proud media partner of the event. Reach out to the top ICT industry players on our Special E-newsletter to be published on September 22 to our global database of ~120,000

Place: Bella Center, Copenhagen, Denmark

19 – 21 SEPTEMBER

GITEX GLOBAL 2023

GITEX GLOBAL unifies the world's most influential ecosystems advancing business, economy, society and culture through the sheer power of innovation, unveiling new worlds of promise.

Place: Dubai World Trade Centre, Dubai, UAE

16 – 20 OCTOBER

Telecom Review Leaders' Summit 2023

The 17th edition of the leading ICT gathering will convene industry leaders and partners, held in a hybrid format to tackle the latest industry trends.

Place: Great Ballroom at Le Meridien Dubai Hotel & Conference Centre, Dubai, UAE

06 – 07 DECEMBER

Latest updates on:

www.telecomreview.com
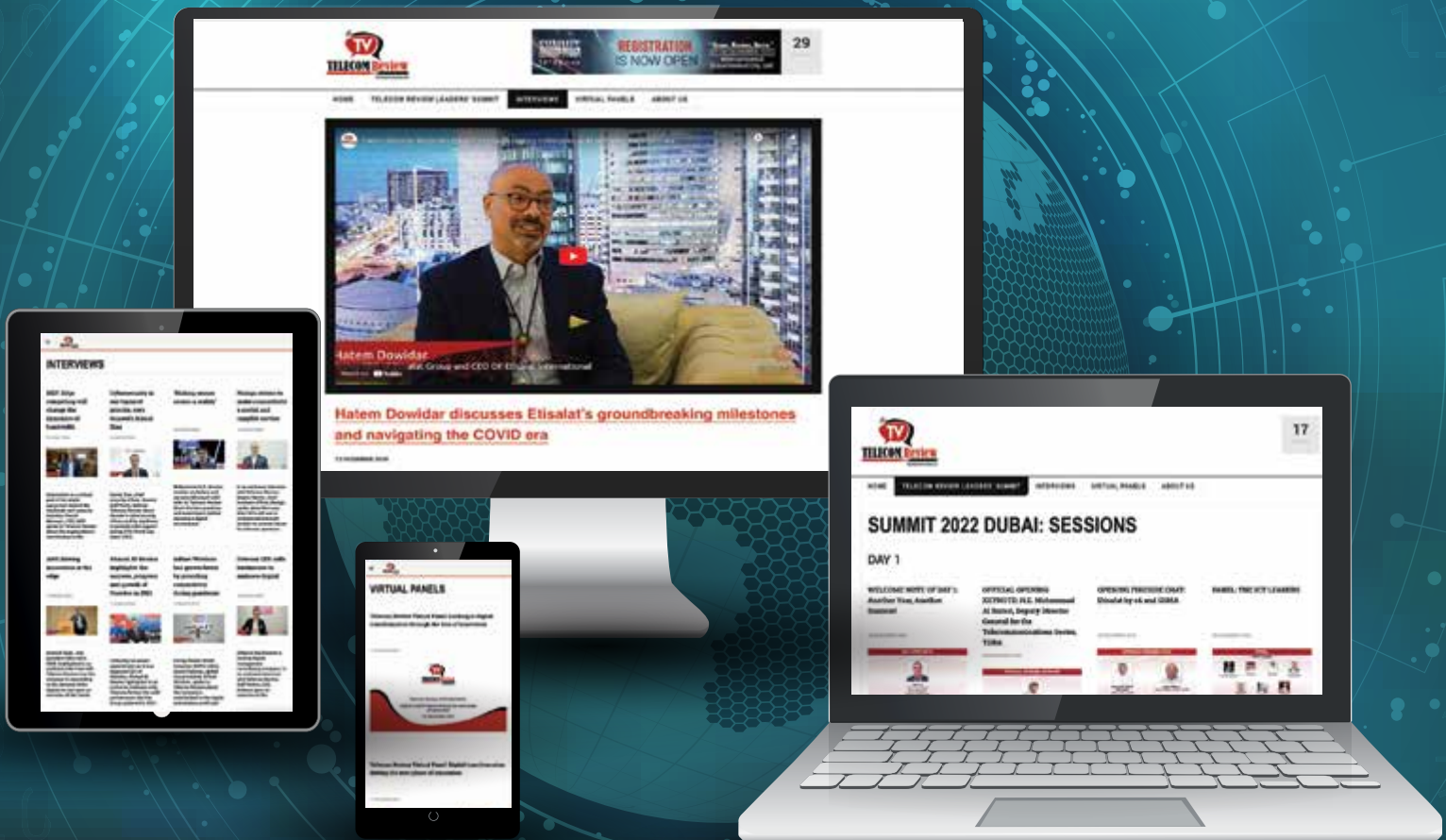
TELECOM REVIEW'S
VIRTUAL PANELS' SERIES
CONTINUES IN 2023

Building on previous years' successes, we continue our mission of connecting THE INDUSTRY'S LEADERS.

For more information on sponsorships and participation, contact:

Issam Eid | issam@tracemedia.info
Mohammed Ershad | ershad@tracemedia.info

The 2023 series of virtual panels will address, among others:
* Wholesale and capacity industry
* Trends in 5G and digital transformation

Leading Global ICT
Media Platforms

Middle East

TELECOM Review
THE TELECOMS INDUSTRY MEDIA PLATFORM
telecomreview.com

5G-Advanced
Is the Future of Communication

CPaaS for Modern Businesses: Unifying Channels, Amplifying Impact | Telecom Industry's Trinity: Spectrum, Space and Sustainability | How Cloud Technologies Can Help Low-Carbon Industries

Arabia

تيليكوم ريفيو
TELECOM Review

التطورات التكنولوجية المتسارعة تثير قلق البشرية..
فهل خرجنا عن السيطرة؟

Africa

AFRICA **TELECOM Review** AFRIQUE
THE TELECOM INDUSTRY'S MEDIA PLATFORM | LA PLATE-FORME MEDIA DE L'INDUSTRIE TELECOM
telecomreviewafrica.com

Opportunity Unleashed:
Shaping AI for a Better Tomorrow
Une opportunité à saisir :
L'IA au service d'un meilleur avenir

North America

TELECOM Review
THE TELECOM INDUSTRY'S MEDIA PLATFORM
telecomreviewna.com

ARTIFICIAL INTELLIGENCE
Takes the Tech Highway

EXA Infrastructure Expanding Growth for the American | TELUS's Rola Araj: Making an Impact in 2023 and Beyond | Verizon President Eric Cevis: Delivering on the Needs of their Partners

Asia

TELECOM Review ASIA PACIFIC
THE TELECOM INDUSTRY'S MEDIA PLATFORM
telecomreviewasia.com

5G
UNLEASHING THE FUTURE:
Endless Possibilities With 5G Advanced