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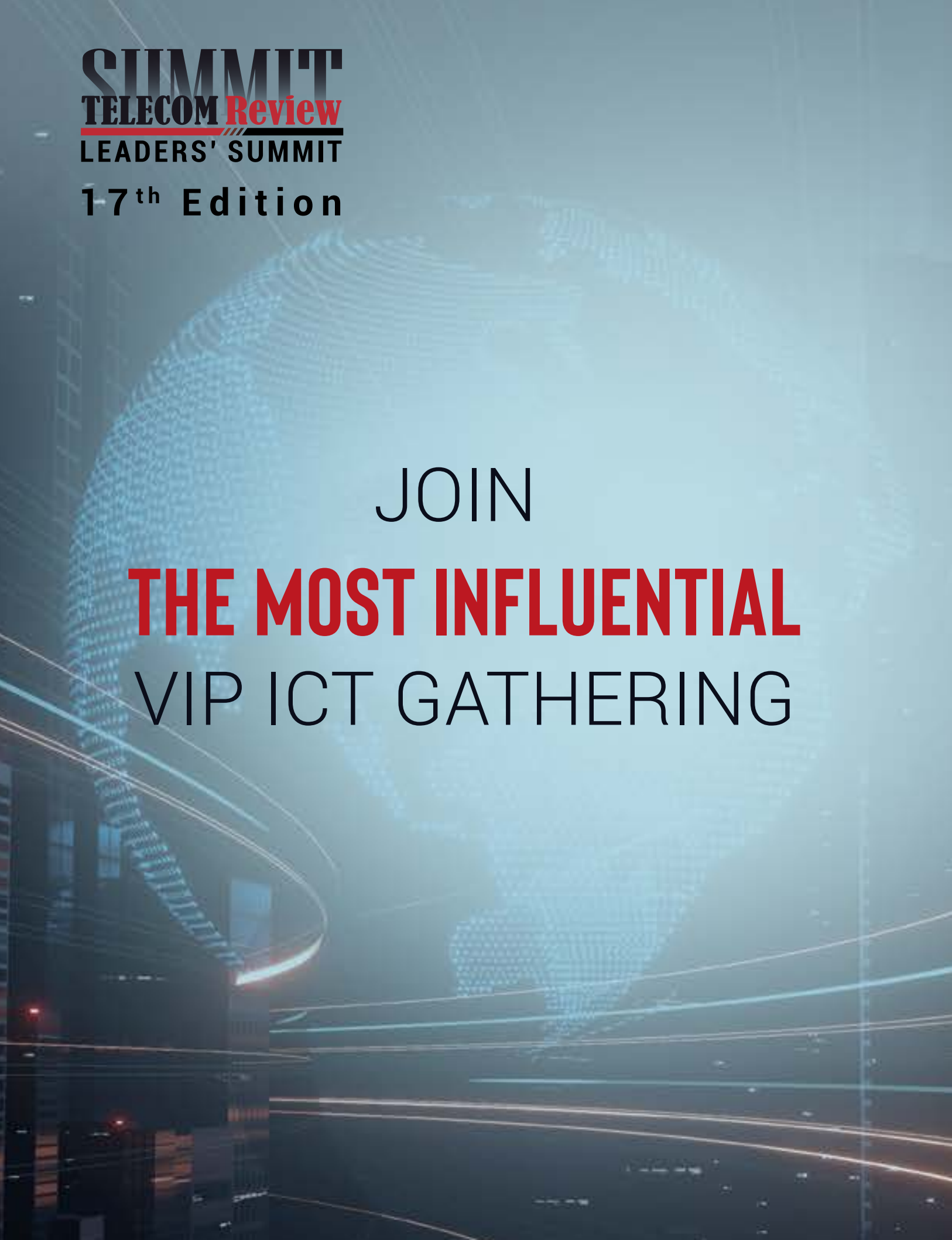
HUAWEI: Stimulating Innovation and Growth in the Digital Economy

STEVEN YI
President of Huawei Middle East & Central Asia

Charting a Course to Safety: The Vital Role of Radiocommunications at Sea

From Algorithms to Dollars: The Battle to Commercialize Generative AI

Building an Effective ICT Workforce: The Challenges and Opportunities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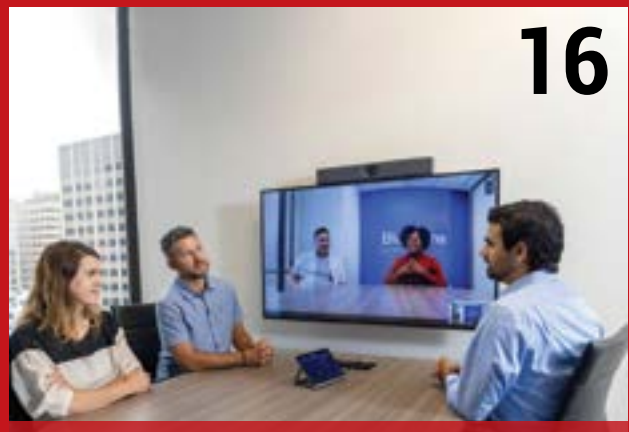
■ Ooredoo Oman: Driving Customer Experience 'CX' Through Digital Innovation

■ Nokia and the Network: Catering to Unique Needs and Optimizing Key Resources



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AI's Gaze Into Cardiovascular Health

With the power of Google's AI, cutting-edge eye scans can now offer a promising alternative in the prediction of cardiovascular events. A South Korean study has additionally explored AI for coronary angiography, leading to automated and real-time insights and advanced cardiovascular care.

AI-Driven Revolution: Empowering Drug Discovery Through In-Silico Methods

Utilizing in vivo and in vitro models, AI-powered in-silico methods are expediting lead compound generation with enhanced accuracy, cost efficiency and shorter timeframes. Over 30 companies have pioneered this innovation, showcasing its global impact and diverse applications.

The Threads App Sets Download Speed Record, Ignites Twitter Backlash

Instagram's new app, Threads, achieved over 30 million downloads shortly after its launch, surpassing ChatGPT's record. The app aims to rival Twitter and has attracted prominent users. However, Twitter is less than enthused and has threatened legal action, claiming trade secret theft.

Why is Meta in a Tight Spot in Norway?

Data privacy concerns in Norway have put US-based big tech firm Meta in a tight spot. Norway's data protection agency has threatened to ban Facebook and Instagram owner Meta from using the personal information of users for targeted advertising with a $100,000 daily fine if the company continues its activities.

AMECA: Advancing Human-Robot Interaction

Meet Ameca, the humanoid robot advancing human-robot interaction! Equipped with advanced sensors and AI capabilities, Ameca bridges the gap between man and machine. Its natural interactions and emotion detection make communication seamless, offering exciting possibilities for the future of robotics.

Introducing Belle, the AI Robot Spy Fish

The new autonomous AI robot, Belle, can provide researchers with detailed underwater images and video coverage.

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Steven Yi, President of Huawei Middle East & Central Asia

Huawei: Stimulating Innovation and Growth in the Digital Economy

In an exclusive interview with Telecom Review, Steven Yi, president of Huawei Middle East & Central Asia, discusses the importance of collaboration among national regulators, operators and vendors in accelerating the growth and innovation of the digital economy in the 5G era and beyond.

As a leading ICT technology provider, Huawei must work very closely with many national regulators. How do you perceive the role of the regulator in supporting the growth of the country's digital economy?

The rapid development of the digital economy is pivotal in driving economic growth and fostering innovation within a country. Among the various key stakeholders involved, regulators hold significant importance in establishing a supportive environment for the growth of the digital economy.

Regulators are crucial in creating a favorable regulatory environment that encourages investment, competition and innovation. Developing transparent and predictable rules and regulations instills confidence in businesses and creates an attractive environment for domestic and foreign investments. This supportive regulatory framework promotes trust and stability, which are essential for the growth of the digital economy.

Fair competition and market efficiency are vital for driving innovation and delivering better services in the digital economy. Regulators are responsible for ensuring a level playing field by monitoring mergers and acquisitions, preventing monopolistic behavior and promoting healthy competition. By actively promoting fair competition, regulators enable vendors to innovate, reduce costs and enhance market efficiency. Ultimately, this benefits consumers by providing them with more choices and fuels the overall growth of the digital economy.

Regulators also play a critical role in safeguarding consumer rights and data privacy. By establishing data protection regulations and frameworks, they ensure that individuals maintain control over their personal information and that businesses handle data responsibly.

Additionally, regulators facilitate the development of digital infrastructure,

such as broadband networks and communication technologies. By implementing policies that encourage investments in infrastructure, they enable widespread access to high-speed internet and reliable digital services.

Innovation and entrepreneurship are at the core of the telecom industry's growth in the digital economy. Regulators must adopt an agile and forward-thinking approach to enable innovation while ensuring compliance with existing regulations. Initiatives such as establishing sandboxes and innovation hubs foster collaboration and experimentation, contributing to the overall growth of the digital economy.

As technology rapidly advances, regulators need to adapt and implement policies that facilitate the growth of emerging technologies. It includes developing key policies surrounding the spectrum allocation in the 6GHz band, advancing 5.5G, laying the groundwork for 6G development, prioritizing network quality, adopting internal standards such as GSMA NESAS to ensure cyber security and incorporating low-carbon solutions to achieve the country's Net Zero vision to ensure sustainable digital transformation.

As you mentioned, national regulators play critical roles in creating the right environment to encourage digital economic growth. Can you give some examples where national regulators foster a favorable environment for operators and vendors in the digital economy?
In pursuing digital transformation, a country's vision for development serves as the primary driving force. Regulators collaborate with various stakeholders to define clear goals, devise comprehensive action plans and establish policies that guide the development of the national ICT industry. These concerted efforts stimulate investment in infrastructure, create an environment conducive to innovation and foster seamless connectivity that empowers individuals, businesses and communities alike.

Countries such as KSA and the UAE have demonstrated the significance of a visionary approach to ICT development.

KSA has embarked on an ambitious journey with its transformative "Saudi Vision 2030" plan, aimed at diversifying its economy and building a robust digital ecosystem. By prioritizing ICT development, the country has implemented policies that support the deployment of cutting-edge technologies, including 5G, the Internet of Things (IoT) and artificial intelligence (AI).

The progress achieved in KSA has resulted in demands for enhancing connectivity and improving network quality, empowering sectors such as healthcare, transportation and education. As such, Saudi Arabia's Ministry of Communications and Information Technology (MCIT) and Huawei have signed a memorandum of understanding to enhance cooperation in the field of communications and information technology, aiming to realize a "10 Gbps Society" [while] seeking to build a superfast broadband infrastructure to support the digital transformation goals of Saudi Vision 2030.

The UAE, renowned for its forward-looking approach, launched the "UAE Digital Economy Strategy" in April 2022 to double the contribution of the digital economy to the UAE's non-oil GDP from 11.7% to over 20% within the next decade. The UAE has successfully improved network quality and connectivity coverage by leveraging advanced technologies and investing in critical infrastructure. These efforts have significantly contributed to the growth of the digital economy by attracting global investments and fostering innovation across various sectors.

To continue the development, the national regulator, the Telecommunications and Digital Government Regulatory Authority (TDRA), assigned the world's leading bandwidth spectrum in the early 5G era, with 694 MHz in total on C-band and 2.6 GHz. In 2021, the UAE allocated 5G mmWave, which offers higher data transmission rates and a larger communication capacity per square kilometer while ensuring service quality and enhancing performance.

As we all know, spectrum allocation is one of the national regulators' key responsibilities, and you mentioned 6 GHz. Why is 6 GHz so important for 5G and future 5.5G networks, and how do you see the national regulator's involvement in allocating and managing spectrum bands such as 6 GHz?
In today's increasingly connected world, investing in network connectivity is not just important but crucial. These networks serve as the vital infrastructure that connects people, devices and data, enabling the rapid and accurate transmission of information.

> Regulators are crucial in creating a favorable regulatory environment that encourages investment, competition and innovation

5G technology has had a profound impact on network connectivity globally. It has revolutionized various aspects of our society, industry, economy and sustainability. In the Middle East, for instance, 17 commercial 5G networks already cover an impressive 45 million people. Countries like the UAE and Saudi Arabia have been early adopters of this technology, reaping the benefits of high-speed internet accessibility. Moreover, Kuwait has demonstrated that an intelligent 5G network can lead to significant energy savings of up to 20%. Recognizing the vast potential, the Saudi government has set ambitious goals to improve internet connectivity in urban and rural areas, aiming to contribute 19% of the GDP through digitization.

The widespread adoption of 5G technology is desirable and essential for driving digital transformation and fueling global GDP growth. Therefore, the government should prioritize the development of 5G networks and seize the economic opportunities they present. However, the expansion of 5G faces challenges in areas with limited access to the mid-band spectrum, which ranges from 1-2 GHz. Building dense 5G networks without this spectrum necessitates using expensive and inefficient equipment, resulting in higher overall costs.

Thankfully, the 6 GHz spectrum emerges as a solution by providing coverage and capacity for seamless wide-area connections. With its balanced mid-band spectrum, the 6 GHz range facilitates the implementation of next-generation connectivity more cost-effectively and efficiently, reducing the need for extensive network densification.

Spectrum allocation is a critical area where national regulators play a decisive role. The 6 GHz band, with its abundant spectrum resources, enables high-speed wireless communication. To maximize the benefits of the 6 GHz band, regulators can formulate policies that balance licensed and unlicensed usage. By designating specific portions of the band for licensed use, regulators ensure the reliable operation of critical services and foster innovation, spurring the development of new applications and services.

As 5G networks continue to evolve, operators in the Middle East are actively involved in driving the development of 5.5G, the next-generation wireless technology. To facilitate the successful expansion of 5G networks, operators are strategically focusing on the possible allocation of the 6 GHz spectrum bands. The harmonization of this spectrum is of utmost importance, as it holds significant potential to become a valuable resource akin to the widely utilized C-band.

Leveraging the 6 GHz band allows for the attainment of desired data rates crucial for the commercial viability of 5G, particularly in densely populated urban areas. Moreover, it establishes a robust foundation for future implementations of advanced 5G technologies like 5.5G, further enriching connectivity capabilities and driving innovation.

It is worth noting that the maturity of network infrastructure and the existing installed base can vary among countries. Nations with the least developed fiber connections are in a favorable position to harness the 6 GHz band for deploying 5G networks that adhere to the IMT-2020 standards. This strategic approach enables them to effectively meet the data and spectrum requirements for the mid-band spectrum, catering to the connectivity needs of highly populated cities and remote rural areas. By offering cost-effective solutions that promote widespread adoption, this approach ensures that the benefits of 5G are accessible to all.

Global harmonization of the 6 GHz spectrum will amplify demand and foster consensus regarding its use, empowering nations to fully leverage its potential for driving economic development and technological advancement. By embracing this harmonization, countries can position themselves at the forefront of the digital revolution, seizing the benefits of a connected future.

How important is the collaboration between the telecom regulator, operators and vendors in ensuring the successful rollout and adoption of 5.5G and future wireless technologies for the digital economy?

As the telecom industry rapidly evolves, the deployment and widespread adoption of advanced technologies like 5.5G are crucial for driving the growth of the digital economy. The advancements of the 5.5G era will provide impressive speeds of up to 10 Gigabits per second

and support a wide range of Internet of Things (IoT) scenarios by integrating sensing communication capabilities. Adapting our infrastructure to meet the requirements of the 5.5G age is necessary and essential to meeting user expectations for a more immersive and connected experience.

National regulators are pivotal in shaping the telecommunications landscape by establishing comprehensive standards and regulations. These regulations provide a foundation for the deployment of next-generation technologies. Close collaboration between regulators, operators and vendors enables the alignment of strategies, ensuring a harmonized approach to meet regulatory requirements. This streamlines the rollout process, enhances interoperability and accelerates the adoption of 5.5G and 6G technologies.

The successful implementation of advanced networks relies on the seamless integration of advanced ICT infrastructure components. In collaboration with vendors like Huawei, operators undertake the monumental task of building the necessary network infrastructure. They ensure the swift and efficient deployment of base stations, antennas and other critical network elements. This collaborative effort enables operators to establish robust, high-performing and secure networks that cater to the increasingly digital economy's demands.

To realize the full potential of 5.5G technologies, operators and vendors are both responsible for funding research, development and large-scale deployments. Regulators can provide incentives, favorable regulatory frameworks and public-private partnerships to encourage operators and vendors to invest in these transformative technologies. Such collaborative initiatives pave the way for accelerated innovation and facilitate the seamless integration of 5.5G networks into the digital economy. A primary example of such collaboration is when UAE TDRA, etisalat by e&, du, infraX, Quanray, HTC, Lierda and Huawei jointly launched the 5.5G OpenLab.

The lab is dedicated to building a 5.5G ecosystem alliance, testing ecosystem interoperability and developing advanced use cases for consumers, homes and industry sectors.

As a finite resource, spectrum plays a critical role in wireless communications. National regulators hold the key to unlocking this invaluable resource and allocate spectrum to operators for specific purposes. Collaborative engagement among regulators, operators and vendors ensures an efficient spectrum allocation strategy that aligns with the requirements of wireless technologies. By optimizing spectrum management, operators can enhance coverage, capacity and quality of service, enabling the digital economy to thrive on seamless connectivity.

Developing a vibrant and thriving ecosystem is pivotal to unlocking the true potential of 5.5G technologies. By aligning their efforts, sharing knowledge and coordinating strategies, regulators, operators and vendors can create innovative services and applications that leverage the immense capabilities of advanced networks. This collaboration stimulates the growth of the digital economy, enabling new business models and revenue streams.

How can the national regulator collaborate with operators and vendors like Huawei to address potential challenges related to network quality, cyber security and sustainability in deploying advanced networks to support the digital economy?

Collaboration between the national regulator, operators and vendors like Huawei is crucial to addressing potential challenges related to network quality, cybersecurity, and sustainability when deploying advanced networks to support the digital economy. Here are some ways I believe we can collaborate effectively:

Establish regular communication channels between the national regulator, operators and vendors. This can include meetings, workshops, forums or online platforms to exchange information, discuss challenges and share best practices.

To ensure that policies are both practical and in line with industry capabilities, it is essential to actively involve operators and vendors. Their valuable technical knowledge and expertise should be sought during the formulation of regulations and guidelines pertaining to network quality, cybersecurity and sustainability.

An excellent illustration of this collaborative effort is the utilization of the GSMA NESAS by regulators we have partnered with, encouraging these regulators to incorporate the GSMA NESAS into their national network cybersecurity policies, recognizing its efficacy in enhancing security practices.

Huawei openly collaborates with industry-recognized certification bodies, conducting comprehensive tests on the cybersecurity capabilities of our products. These tests are conducted according to international standards and best practices, enabling us to provide customers with globally recognized security assurance.

> Innovation and entrepreneurship are at the core of the telecom industry's growth in the digital economy

> Countries such as KSA and the UAE have demonstrated the significance of a visionary approach to ICT development

Underscoring the proven security of Huawei products, we proudly obtained more than 30 internationally recognized cybersecurity certificates in 2021, including the certification for the world's first GSMA Network Equipment Security Assurance Scheme (NESAS) 2.2 audit for 5G base stations. This particular certification serves as a concrete example that we share with regulators, demonstrating our commitment to upholding the highest cybersecurity standards in the industry.

To foster the secure and sustainable development of digital services, it is crucial to establish training programs and capability-building initiatives for regulators. Collaborating with industry experts, the national regulator can design and deliver customized training programs covering diverse areas such as technology, regulatory frameworks, ICT policies and digital transformation.

Huawei has a longstanding dedication to knowledge sharing and actively engages with regulators to define training topics and schedules. By offering comprehensive training opportunities, we aim to equip operators and vendors with the necessary expertise to implement and maintain advanced networks securely and sustainably. This collaborative approach fosters a strong foundation for the development of cutting-edge telecommunications infrastructure and ensures the successful deployment of advanced networks.

Establish a regulatory sandbox environment where operators and vendors can test and deploy innovative technologies and solutions. It fosters collaboration, allows for experimentation and enables the identification of potential challenges and their mitigation strategies in a controlled environment.

Encourage operators and vendors to conduct pilot projects and demonstrations to showcase the benefits of advanced networks. The national regulator can support these initiatives by providing the necessary regulatory flexibility and promoting the adoption of successful practices.

Conduct periodic reviews and audits of deployed networks to assess their quality, cybersecurity posture and sustainability. The national regulator can work closely with operators and vendors to identify areas for improvement and ensure compliance with regulatory requirements.

Promote research and development collaboration between operators, vendors and academic institutions. Encourage joint projects focusing on network quality, cybersecurity and sustainability enhancements. This collaboration can drive innovation and provide solutions to complex challenges.

Considering the significance of digital economic growth in each country, could you provide a summary of Huawei's contributions to ensuring sustainable digital economic growth in the region?

Huawei has made significant contributions to fostering sustainable digital economic growth across multiple countries. One of our primary contributions is building and developing communication infrastructure, particularly in areas with limited connectivity. By providing advanced telecommunications equipment, such as network infrastructure and mobile devices, Huawei has successfully bridged the digital divide and expanded internet access to remote regions. This

has enabled a wider range of individuals and businesses to participate in the digital economy.

Huawei also plays a leading role in the advancement of 5G technology. As a provider of 5G infrastructure and solutions, Huawei's innovations in this area have supported the expansion of the digital economy by enabling faster and more reliable wireless connectivity. The transformative potential of 5G spans across various industries, including healthcare, transportation and manufacturing, driving economic growth and efficiency.

In addition to advanced communication technology, Huawei Cloud has made significant progress in the region. Huawei Cloud offers Everything-as-a-Service, including Infrastructure-as-a-Service, Technology-as-a-Service and Expertise-as-a-Service, to help customers unlock the potential of digital transformation quickly. Recognized in Gartner's 2022 Magic Quadrant for Cloud Infrastructure & Platform Services (CIPS), Huawei Cloud boasts a global developer base of over 4 million.

Sustainability and low-carbon development have become integral to the development visions of many countries. Huawei Digital Power, a leading provider of digital energy solutions, is committed to advancing sustainable practices and enabling the digitization of the energy sector while aligning with the Paris Agreement's carbon emission reduction goals. They offer low-carbon, safe and clean solutions that enhance energy efficiency and reduce environmental impact. Huawei focuses on energy efficiency, renewable energy utilization and user experience, employing technologies such as "Zero Bit, Zero Watt" and multi-dimensional shutdown technology to minimize power consumption. They prioritize the efficient deployment of renewable energy and collaborate with operators and standard organizations to promote green indicators and establish energy efficiency benchmarks. By joining forces, Huawei aims to construct networks that prioritize user experience and energy efficiency, driving industry-wide adoption of sustainable practices for a greener future.

As part of its commitment to sustainable development, Huawei has taken a multifaceted approach that extends beyond low-carbon technology. We have actively participated in human capacity-building and knowledge transfer programs, working in collaboration with local governments and educational institutions. By providing training and skill development opportunities in digital technologies, Huawei aims to equip individuals with the necessary knowledge and skills to thrive in the digital era. This focus on empowering local talent has not only fostered digital entrepreneurship but also contributed to job creation.

As a result of these initiatives, we have seen an increasing number of digital talents, start-ups and technology-driven businesses flourish, leading to overall economic and technological advancements in the region. Huawei's dedication to capacity building and knowledge transfer has had a profound impact on supporting the growth of the digital economy and empowering local communities. By investing in human capital and fostering innovation, Huawei has played a vital role in shaping the future of the region and promoting sustainable development. TR

> Huawei openly collaborates with industry-recognized certification bodies, conducting comprehensive tests on the cybersecurity capabilities of our products

ooredoo

Ahmed Diwan, Chief Commercial Officer (CCO), Ooredoo Oman

Ooredoo Oman: Driving Customer Experience 'CX' Through Digital Innovation

In an exclusive interview with Telecom Review, Ahmed Diwan, chief commercial officer (CCO), Ooredoo Oman, shares insights about the company's achievements, how they are paving the way towards 5G and enriching customer experience (CX), as well as their future projects.

Ooredoo was recently named Oman's Most Innovative Digital Transformation Telecom Company for 2023.

From your perspective, why is this achievement important for Ooredoo Oman?

As a telecommunications provider, we have been leveraging emerging technologies that have been transforming the telecom industry and providing our customers with a unique end-to-end digital customer experience. We are at the forefront of the sector's digital revolution by being agile and dynamic and raising the game by embedding customer-centricity within the organization.

This award is testament to the hard work, dedication and achievement of this strategy which we have had in place. At the same time, it also boosts our organizational reputation and shows what sets us apart. It fuels our drive to revolutionize telecoms in Oman with a "first to market" approach with new digital technology.

Indeed, our numerous digital and customer experience awards highlight our world-class, leading digital CX and recognize our efforts to continue moving forward and innovate when it comes to new technology and services. We are also leveraging our resources — partnerships, people, network, the latest tech and tools — to expand our digital reach and footprint and provide a world-class service that connects communities across Oman.

How is Ooredoo leading the way with 5G?

Ooredoo has 5G everywhere and anywhere across Oman. Indeed, we were the first telecoms company in the region to achieve nationwide coverage. 5G is a great enabler, both for individuals and businesses. We aim to enrich our customers' digital lives, and 5G does just that; it's all about a better lifestyle through faster internet speeds, improved connectivity and a better customer experience overall. We want our customers to enjoy everything the internet has to offer and live the experience of better upload and download speeds, smoother streaming, enhanced online gaming, higher-quality video calls and much more! As 5G technology continues to expand, its impact on enriching digital experiences is also expected to grow.

Technologies such as AI, IoT, Cloud solutions and many other over-the-top services (OTTs) also rely on fast, reliable connectivity to enable a vast array of transformative services. But 5G goes further. The 5G infrastructure we are putting in place and the technology it empowers will ultimately enhance the GDP of Oman and impact both the economy and all business sectors positively.

For us, the embodiment of Ooredoo's commitment to digital lifestyle enhancement is our multi-award-winning Ooredoo App, which gives customers a way to manage every aspect of their telecoms service. By broadening internet accessibility through 5G, we are championing innovation and adding value. Indeed, we have introduced the best digital services and pioneering technologies, from comprehensive and customizable bundles with added options to mobile financial solutions (MFS); we have something for every customer.

What steps are you taking to enrich the customer experience, and how can you continue to use the latest technologies in the field of digitization and leading solutions?

Our focus has been, and will continue to be, our customers. By providing them with an end-to-end integrated customer journey, we build loyalty and a strong brand-customer connection.

We make smart use of digital to meet ever-changing customer needs and expectations and provide a seamless omni-channel digital customer experience. By expanding and evolving our products and services and enhancing every touchpoint for our customers, we can truly provide them with something different.

Across all touchpoints, we connect with our customers through our App, online Chatbots, social media, an award-winning contact center, immersive stores, franchises and local dealers countrywide. And by providing a diversified portfolio of services that meet every customer need and focus on individuality, we aim to provide the ultimate in value and choice.

For us, it is digital from A to Z. We have the highest penetration for digital services. Including our apps, social media channels, website and chatbots, and all other digital touchpoints, we have over 50% digital penetration to our customer base, and 45% of all Ooredoo transactions are now digital interactions/ services.

We have also embedded customer experience within our culture at Ooredoo, and as such, are a customer-centric organisation. Indeed, part of our mind-set when developing products or services is to always ask ourselves: how does this upgrade the world of our customers?

In light of tough competition, how does Ooredoo Oman stand out?

We gave our customers a promise — to "upgrade your world," and we do that in many ways. We are moving the sector and the nation forward. As pioneers in the sector, we have established ourselves as consistently being the first (and fastest) to market with cutting-edge services. We also capitalize on the strength of being part of a global group, using our widespread footprint and power to deliver advanced solutions. This digital footprint expansion and our "Voice of the Customer" program (more on that later) are aligned with a Group-wide approach to enhance our online presence in a way that resonates with our diverse customer base. Our commitment to innovation and forward thinking sets us apart, enabling us to shape the future of the telecoms landscape.

Our fresh approach to CX has made us an industry leader across many channels. As a digital leader in Oman, we are responsible for digital enablement and connectivity. We connect the world and have always thrived on delighting our customers, which makes us stand out from the competition. We are the provider of choice when it comes to our customers communications experiences and technology needs.

Moreover, our focus on regionalization means that we are now closer to customers across the country, providing them with services uniquely important to them in their area.

A solid partnership with our distribution network has been invaluable in covering the entire country and meeting the needs of diverse communities. With their knowledge of the local market and close relationships with our customers, our partners and dealer network can offer tailored solutions, products and services.

Customers always come first, but how does Ooredoo Oman keep pace with changing customer demands?

Every aspect of our service is tailored to deliver a seamless, omni-channel customer experience. We leverage emerging technologies and other resources, including local and international partnerships, people, network and tools, to meet ever-changing needs and expectations. We provide an exceptional service to connect communities across Oman, especially those in isolated regions that depend on access to a strong and stable network for education, business, and trade.

We spare no effort in providing our customers with the best tools, tech and service to fulfill their dreams as business owners, elevate their quality of life and have greater access to education, training and opportunities.

Our achievements are reportable, too, so customers can trust Ooredoo. We measure our customer experience and, last year, launched our Voice of the Customer (VOC) program, which has transformed customer engagement and customer centricity across the company. This advanced concept and initiative tackles the customer experience from the inside out, across all touchpoints, and by looking closely at customer feedback to shape and drive excellence.

An "always on" customer has telecoms technologies woven into the fabric of their daily lives, and this has been the driving force behind our strategy. In the spirit of the program, we also launched "Customer Day," the first of what will become an annual event. Our executive team and senior management took part, meeting and engaging with customers on the ground to gain first-hand experience and feedback, which is fed directly back into our VOC program. This 360-degree approach means that we are constantly in touch with changing customer needs and are quick to implement new ideas and requirements.

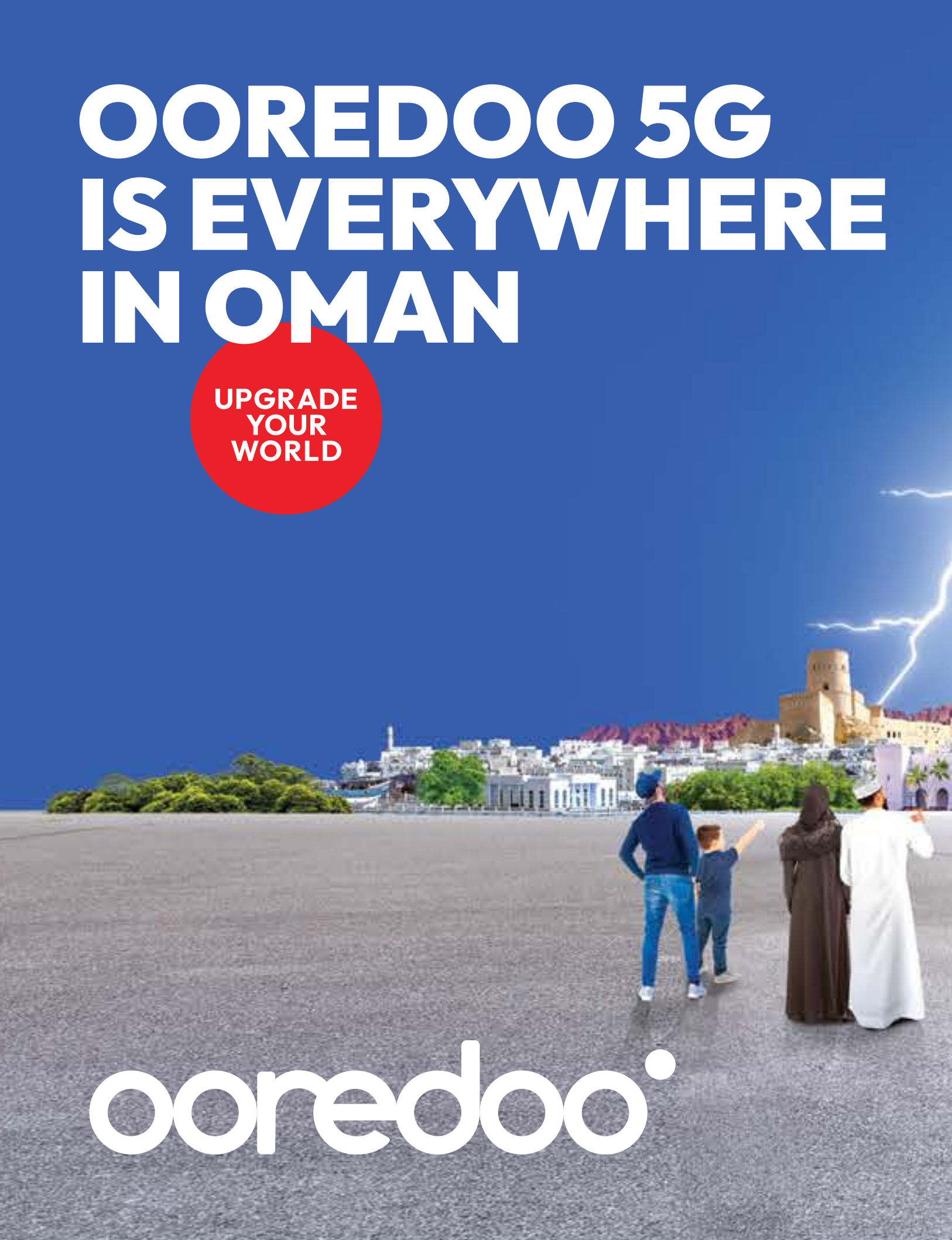
Elsewhere, we partner with organizations such as banks, tech companies, and other third parties to maximize, optimize and differentiate the CX and customer journey. We believe in becoming stronger through partnerships with international and local companies, both within the sector and outside the sector. Every partner is an important part of the value chain, and every organization has a major role in keeping the ecosystem that we have created going. They also contribute to the national economy, by providing local employment and business growth opportunities.

What are your future projects at an operational level in Oman and the region as a whole?

The Ooredoo Group has, at its core, a robust strategy designed to ensure the organization is future-proof and well-placed to leverage our technology, experience and partnerships, creating an unrivaled customer experience. With so many aspects of people's lives now online — and demand for fast, reliable networks are ever-increasing — the role of a quality connectivity provider has never been more important, and we shoulder this responsibility with pride.

We will continue our digital-first strategy in 2023 and beyond, expanding and digitalizing all of our touchpoints. We will also stay focused on being agile and adaptable and on maintaining a culture of innovation within both our organization and in our many partnerships with world-leading technology providers.

Our aim is to upgrade the world of our customers and our communities, and this remains a differentiating factor and part of our core identity, which we will carry forward into our upcoming projects, products and services. TR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5G

Danial Mausoof, Head of Sales for Mobile Networks, Nokia Middle East and Africa

Nokia and the Network: Catering to Unique Needs and Optimizing Key Resources

In an exclusive interview with Telecom Review, Danial Mausoof, head of sales for mobile networks, Nokia Middle East and Africa, shares his company's expertise in network optimization and its Technology Vision 2030, which will shape the network infrastructure in the MEA region.

How does Nokia ensure network performance that is critical for both CSPs and enterprise customers?

As a B2B technology innovation leader, Nokia employs a holistic approach to ensure network performance for CSPs and enterprise customers. This holistic approach encompasses all aspects, ranging from robust network planning and design to the selection of high-performance products, high-quality deployment and continuous monitoring and assurance of network performance.

Nokia's Network Planning Services offer a comprehensive and customized approach to designing networks. By harnessing advanced tools, methodologies and analytics, we cater to the unique needs of networks, ensuring optimal utilization of resources.

When it comes to product performance, our market-leading AirScale portfolio offers advanced features, reliable performance and scalability, allowing operators to meet the increasing demands of their customers while staying competitive in the evolving telecommunications landscape.

For Network Performance Monitoring, Nokia provides advanced real-time monitoring and analysis tools. These tools, utilizing AI/ML technology, provide actionable insights and recommendations that can be utilized to enhance network performance.

Lastly, Nokia's Network Performance Optimization and Assurance solution offers a comprehensive suite of tools and services to assure the highest quality of service and customer experience. These solutions incorporate automation capabilities to streamline network operations and reduce manual intervention.

In the MEA region, Nokia's AirScale products have made a significant impact, having been adopted by 58 customers spanning 36 countries, a testament to their reliability and effectiveness. Moreover, 35 clients in the MEA region are reaping the benefits of Nokia's Network Planning and Optimization (NPO) services, a clear indicator of our commitment to provide innovative solutions that drive customer satisfaction and operational excellence.

Can you share network performance figures relevant to the MEA region? How have these changed over the years, and how do you see this continuing to evolve?

In terms of network performance, the MEA region can be divided into two distinct areas: the Middle East and Africa. These regions show significant differences in User Equipment (UE) ecosystems

and end-user behavior, largely influenced by their unique social and economic structures. This results in a broad spectrum of considerations, ranging from the introduction of new technologies to the long-term evolution of traffic.

Prominent trends that are distinctly observed in the MEA region include:
1. Data traffic continues to increase at an exponential pace. In GCC countries, 5G data traffic has already exceeded 3G, according to Nokia's latest MEA Broadband Index report.
2. Overall, 94% of MEA voice traffic is on 2G/3G, and only 6% is on VoLTE. In GCC countries, adoption of 5G and VoLTE services is observed to be much higher than the rest of the MEA; e.g., VoLTE traffic share exceeds 50% among major operators of the GCC.
3. The GCC is currently the most mature region in terms of the 5G device ecosystem, with approximately 36% of the UEs having 5G capability. However, many 5G-capable devices are still connected to the 4G layer due to a lack of 5G coverage. 5G coverage enhancement will increase the overall 5G traffic share.
4. Overheating of 5G User Equipment (UE) is a notable issue observed by operators in the region. This overheating can sometimes cause UEs to drop the 5G connection, leading to a poor user experience and posing a potential obstacle to the growth of 5G technology.
5. In the Gulf region, a significant increase in 5G residential FWA traffic has been observed. For one of the leading operators, 5G FWA traffic share has reached 87% compared to a 13% LTE traffic share.
6. Nokia has also been very actively involved in sustainability initiatives across the MEA. In 2022, these initiatives yielded encouraging outcomes:

- A 6% to 10% decrease in RAN energy consumption with the help of Nokia's AI-based SON Energy Saving Module.
- Up to 10% reduction in power consumption with smart Network Planning and Optimization services.
- Up to 15% energy savings with RAN SW features such as Intelligent switch-off of unused resources with Micro DTX, Cell switch-off, MIMO muting and Deep sleep modes.

What are the key challenges impacting network performance in the MEA region, and how will you continue to thoroughly address these?

Among the array of challenges, the predominant ones include:
1. Exponential data traffic growth and operational complexity due to the proliferation of data-hungry wireless devices are pushing networks to their capacity limits and introducing planning and optimization complexities.
2. 5G network usage does not follow UE ecosystem growth, and more than half of 5G UE-capable devices are not camping on 5G.
3. Despite good adoption in GCC countries, VoLTE penetration is fairly low in the rest of the MEA region.

Operators can implement certain strategies to overcome these challenges:
1. Reduce network complexity by timely sunsetting legacy technologies. This will also give additional flexibility of very precious low-band refarming to improve 5G coverage and prepare 5G networks for standalone transition.
2. By migrating voice traffic to VoLTE, operators can free up the spectrum used by legacy 2G and 3G networks for other purposes, such as expanding their 4G or 5G coverage or refarming the spectrum for new services.
3. Migration from NSA to SA network is the key for full-fledged usage of 5G's diverse capabilities.
4. Reducing OPEX through automation initiatives such as Self-Organizing Networks (SON) solutions. Having deployed more than 2.5 million cells by 36 operators in MEA, Nokia SON has achieved significant improvements, including a 21% improvement in downlink throughput, a 32% reduction in early handovers and a +30% improvement in voice call drop rate.

From your perspective, why is network performance significant to fulfilling Nokia's Technology Vision 2030 and the company's gearing up for the next technological era?

Nokia's Technology Vision 2030 outlines a trajectory of how future advancements in technology will transform the world by the year 2030. It implies a shift from a "one-size-fits-all" connectivity approach to specialized networks optimized for specific service needs. The vision also emphasizes the potential transformative effects of Metaverse technology, Cloud Computing and Web3, identifying them as the areas that could have the most significant influences as we approach the year 2030.

To unlock the potential of the emerging opportunities, the network must fulfill specific performance criteria, such as:
1. Agility to support the widest range of Metaverse use cases: including the capability for rapid setup and take-down of localized or private networks.
2. Distributed, flexible service instantiation: enabling network resources to be deployed dynamically to provide the best user experience while maximizing resource utilization.
3. Enhanced symmetrical capacity: capability to provide the increased capacities symmetrically, both in downlink and uplink.
4. Sensing, positioning and context-awareness: enabling networks to adapt to user needs autonomously.
5. Intent-based autonomy: allowing for the most advanced artificial intelligence/machine learning (AI/ML)-driven, zero-touch automation possible.
6. Sustainability and efficiency: allowing the network to both extend its handprint and dramatically reduce its footprint.

Nokia's new visual identity, "the power of n," also resonates well with this transformation vision.

We believe networks are the catalysts for change, fueling the innovation that can transform businesses, society and the world. Our wide range of products and services can help customers build and manage more intelligent, interconnected networks and tap their "exponential" potential. TR

BlueJeans vs Zoom: Why the Verizon Platform May Come Out on Top

With the rise of remote work, virtual meetings have become an important part of business operations. Businesses want a credible, user-friendly platform that enables effective communication and real-time collaboration.

Both BlueJeans and Zoom are well-known online meeting platforms. But exactly what is the distinction between the two?

Let's take a closer look at each platform to understand why BlueJeans might be the better option for your organization.

BlueJeans Offers Free and Unlimited Meeting Minutes

Both BlueJeans and Zoom Meetings provide free versions of their platforms, which is great for those who are just getting started or have basic needs for video conferencing. However, it's important to recognize that there are key differences between the two.

BlueJeans offers unlimited meeting minutes on its free version, providing users with more services and greater flexibility. This can be particularly helpful for companies that need extended team meetings or presentations without worrying about time constraints.

Conversely, Zoom's free version can only host meetings for a maximum of 40 minutes before the call is automatically disconnected. While this shorter length may be sufficient for brief team overview calls or personal conversations, it can indeed impede more open discussions that need a longer and more open-ended approach.

BlueJeans vs Zoom: The Tale of the Tape

When comparing BlueJeans and Zoom, it's evident that both platforms offer useful features for businesses and individuals. However, there are important differences to consider when choosing between them.

A key distinction lies in the level of technical support offered. BlueJeans provides a self-serve help center for all plans and live technical support for all paid plans. This means users have several options for accessing immediate assistance if they encounter any technical difficulties. By contrast, Zoom provides a self-serve help center, which may not be as effective for those needing more hands-on support.

Both Zoom and BlueJeans offer security features and capabilities. BlueJeans' enterprise-grade security, however, has a reputation for being particularly safe, with features that include fraud detection, sophisticated authentication and SOC2 Type 2 compliance.

Another notable difference lies in the respective virtual whiteboard features. BlueJeans allows unlimited virtual whiteboards on paid plans, enabling users to create as many boards as they need for meetings or collaborations. Zoom, by comparison, limits users to just three boards, which may be insufficient for larger or more complicated projects that would require the separate purchase of additional boards as needed.

BlueJeans also includes calendar integration, enabling users to quickly schedule and join meetings without leaving their calendar app. Users can also conveniently view upcoming meetings directly from their calendars, easily check in to meetings already underway and even set up automated notifications to remind them of meetings in the future.

The Enhanced Functionality of Blue Jeans

BlueJeans also sets itself apart with advanced features designed to streamline meetings and enhance the user experience. These include:

- **Dolby Voice Spatial Audio:** This feature guarantees clean audio quality by reducing background noise while delivering an immersive audio experience through spatial awareness,

which is particularly important for online meetings where clarity is crucial.

- **Cloud Recording and Streaming Ease:**

This BlueJeans feature allows you to record meetings and effortlessly share recorded video calls, allowing the viewers to replay them at their convenience.

- **Enterprise-Grade Security On Tap:**

BlueJeans has a wide range of comprehensive security features that ensure the highest standards of data security and confidentiality. With its standards-based encryption, BlueJeans guarantees that sensitive information is always secured, both in transit and during virtual meetings.

- **Meetings as You Like Them:**

BlueJeans provides a versatile meeting experience that caters to individual preferences. The premium desktop experience supports Mac, Windows and Linux operating systems, offering a wide range of options for participants to connect and engage in meetings. In addition, it provides an equally immersive meeting experience for both iOS and Android users. Participants are given the option to join meetings using their preferred method, ensuring a seamless and convenient meeting experience across the full range of platforms and devices.

- **Smart Meetings:**

The built-in intelligence of BlueJeans Smart Meetings enables participants to quickly analyze important information via highlight reels, assign tasks and review essential information more efficiently, enabling streamlined collaboration and effective content retrieval.

What Are Its Benefits for Businesses?

There are key reasons why companies should prefer BlueJeans to Zoom, including:

- **Unprecedented Quality:**

BlueJeans is reimagining the future of virtual meetings by providing cutting-edge technological capabilities for the greatest meeting experience, .

- **Enterprise-Grade Security:**

To safeguard private information and assure video conferencing security, BlueJeans offers important features, including end-to-end encryption, single sign-on (SSO) and secure access restrictions.

Conclusion

When it comes to virtual meetings, businesses seek a platform that combines security and ease of use. While Zoom is a popular choice, BlueJeans video conferencing software offers distinct advantages that make it an appealing alternative. BlueJeans provides superior security and unlimited meeting times across all plans. Moreover, it boasts a comprehensive set of features, including real-time transcription and unlimited virtual whiteboards, expanding collaboration possibilities. Finally, BlueJeans goes the extra mile by offering extensive training opportunities, equipping users with the necessary skills and knowledge to effectively utilize the platform. Whatever collaboration needs arise, BlueJeans has the tools to meet them. TR

> BlueJeans offers unlimited meeting minutes on its free version, providing users with more services and greater flexibility

e& Expands in Europe With €2 Billion Acquisition in CEE Region

e& and PPF Group (PPF) have recently signed a binding agreement, bringing exciting changes to the telecom industry. e& will acquire a controlling stake (50% + 1 share economic stake) in PPF Telecom Group's (PPF telecom division's) assets across Bulgaria, Hungary, Serbia and Slovakia.

The deal encompasses significant entities, namely Yettel Bulgaria, Yettel Hungary, Yettel Serbia and O2 Slovakia operations, as well as the CETIN and O2 Networks infrastructure businesses operating in these countries.

The upfront acquisition value stands at €2.150 billion, with the potential for additional earn-out payments to PPF amounting to €350 million if certain financial targets are surpassed within the three-year period post-closing. However, if these targets are not achieved, a claw-back provision will be enforced.

It's worth noting that PPF Telecom's infrastructure businesses in the abovementioned countries are fully independent and not tied to the service companies' operations.

e& and PPF have ambitious plans for synergies between the two groups, aiming to realize substantial OPEX and CAPEX savings. Additionally, the collaboration presents numerous opportunities for introducing e&'s cutting-edge B2B and B2C digital products in Central and Eastern Europe (CEE).

The continuity of operations is guaranteed as they retain Balesh Sharma, the current CEO of PPF Telecom. His expertise, along with the dedication of PPF Telecom's teams in their respective markets, will be leveraged for mutual success. Ensuring stability, both companies are committed to maintaining PPF Telecom's current rating level even after the transaction is completed. Commenting on the strategic expansion into the European market, H.E. Jassem Mohamed Obaid Bu Ataba Alzaabi, chairman, e&, said: "With this move, we join forces with PPF to build and expand our international footprint in the attractive Central and Eastern Europe region and beyond. It is the next step of our transformation into a global technology group, offering e& multiple avenues to roll out its leading suite of B2B and B2C digital products in the CEE with significant synergies.

The acquisition aligns with e&'s strategic ambition to accelerate international growth and diversify geographically. This represents an unparalleled opportunity to establish a strong presence and foster development within the dynamic CEE region. The PPF Telecom portfolio, spanning four countries, exhibits a well-balanced structure underpinned by robust macroeconomic fundamentals and stable currencies. The countries of its operations are characterised by regulatory stability, healthy competition, and highly attractive returns, positioning them among the most promising in Europe," explained Alzaabi.

e& is expected to consolidate more than 10 million subscribers from this acquisition once it is closed, with the acquisition being under e& international, the telecom vertical of e& in global markets.

Dubai RTA Introduces Latest AI Technology to Detect Defects, Bolster Safety

Dubai's Roads and Transport Authority (RTA) is set to revolutionize road maintenance and safety with the deployment of the latest AI technology. The innovative system, equipped with lasers mounted on patrol cars, will scan roads to detect potholes and cracks with incredible precision, even as small as 1mm.

The groundbreaking technology has already created a virtual map of Dubai's extensive road network, boasting an impressive accuracy rate of 97%. This virtual map will play a pivotal role in identifying and addressing road defects, ensuring smoother and safer journeys for residents and visitors alike.

The AI-powered system is a major milestone in Dubai's ongoing efforts to enhance its transport infrastructure and road safety measures. By swiftly identifying road defects, authorities can take prompt action to repair and maintain the roads, reducing the risk of accidents and ensuring the overall reliability of the transport network.

Remarkably, this cutting-edge technology is not limited to Dubai's streets alone. Similar systems developed by CSIRO's Data 61 are being used on iconic structures like the Sydney Harbour Bridge, further showcasing the global significance and applicability of this advanced AI solution.

With the implementation of this AI-powered road defect detection system, Dubai is taking a giant leap towards creating a smarter and more efficient urban landscape. As this technology continues to evolve, the city is solidifying its position as a pioneer in adopting innovative solutions to shape a safer and more sustainable future for its residents and visitors.

stc Group Achieves Notably High Semi-Annual Revenues

stc has announced the company's preliminary financial results for the period ending June 30, 2023.

stc Group achieved the highest semi-annual revenues in its history, reaching SAR 36.5 billion with an increase of 8.17%.

Revenues for the first half of 2023 reached SAR 36,506 million, an increase of 8.17% as compared to the comparable period last year (SAR 33,749.00)

Gross profit for the first half of 2023 reached SAR 18,488 million, an increase of 0.90% as compared to the comparable period last year (SAR 18,324.48)

Net profit for the first half of 2023 reached SAR 6,117 million, an increase of 4.17% as compared to the comparable period last year (SAR 5,872.45)

Semiannual results for 2023 do not include profits from the land sold.

The company also announced a dividend distribution of SAR 0.40 per share for the 2nd quarter of 2023, totaling SAR 1,993.79 million. The distribution date will be 23/8/2023.

Commenting on the results, Olayan Mohammed Alwetaid, stc Group CEO, noted that during the previous period and in line with the company's vision and strategy "DARE 2.0," which includes expansion in size and scope, stc Group, through "solutions" (one of the Group's subsidiaries), signed a binding offer to acquire 40% of "Devoteam Middle East," a leading company in the field of innovative digital business consulting. This expansion will enhance stc Group's capabilities in the information technology sector and enable digital transformation through an integrated system of subsidiaries specializing in digital infrastructure, the Internet of Things, cloud computing, cybersecurity, digital financial services, business outsourcing services and others.

In light of the Group's role as a leading digital enabler in the Kingdom and region, "center3" (one of the Group's subsidiaries) announced the arrival of the world's longest submarine cable, "2Africa," to Jeddah and Yanbu and to reach Duba later this year and Al-Khobar during 2024. In addition, center3 signed a strategic agreement with Huawei to establish a cloud region in the Kingdom, which will provide a high level of advanced and secure cloud services to provide data hosting services and meet the growing demand for cloud services. Moreover, center3 has also increased the capacity of its data center in Riyadh by 9.6 megawatts, aiming to improve and increase the capacity of data hosting services provided by center3 to its customers, which contributes to strengthening the Kingdom's position as a regional digital center.

Zain Omantel International (ZOI) and du Collaborate to Transform Roaming Services in MEA

Zain Omantel International (ZOI), the Middle East's premier international wholesale powerhouse, has recently formed a strategic wholesale international agreement with du from Emirates Integrated Telecommunications Company (EITC). The partnership guarantees exceptional voice, messaging and data roaming services powered by advanced 5G technology connectivity.

The collaboration will significantly improve the customer experience for ZOI and du end-users across two continents. The partnership aims to expand and enhance international roaming services across nine countries, including the UAE, Kuwait, Oman, Saudi Arabia, Bahrain, Jordan, Iraq, Sudan and South Sudan.

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The collaboration will significantly improve the customer experience for ZOI and du end-users across two continents. The partnership aims to expand and enhance international roaming services across nine countries, including the UAE, Kuwait, Oman, Saudi Arabia, Bahrain, Jordan, Iraq, Sudan and South Sudan.

Sohail Qadir, ZOI CEO, said, "This agreement between two innovative entities further demonstrates our commitment to transforming the business and creating synergies while extending our reach and capabilities to provide the highest quality services to our customers."

Fahad Al Hassawi, du CEO, commented, "The partnership between ZOI and du signifies a pivotal move in our joint pursuit of providing exceptional telecommunication services to our valued customers. With the substantial roaming traffic exchange in the UAE, our collaboration enables us to harness each other's unique strengths, positioning us at the forefront of shaping the future of roaming."

UAE Tops Global Mobile Internet Speed in June: Report

The UAE has ranked first globally in mobile internet speed for the month of June, with a download speed of 204.24 Mbps and an upload speed of 22.72 Mbps, according to the SpeedtestGlobal Index published by Ookla, a web service that provides analysis of Internet access performance metrics.

According to the index, the UAE topped the global rankings during the first half of 2023 (January, February, March, May and June), while it ranked second in April.

As for fixed broadband speed, the UAE ranked second globally and first regionally among Arab countries in June, with a download speed of 239.2 Mbps. Singapore topped the fixed broadband list with a speed of 247.29 Mbps.

The top 3 countries for mobile median download (Mbps) speed were the UAE (204.24), Qatar (182.98) and Kuwait (152.95).

And the top 3 countries for fixed broadband median download speed were Singapore (247.29), the UAE (239.20) and Chile (229.48).

Download speed refers to how quickly users receive text, images, music, video and other data online. Most online activity involves downloading, including viewing web pages, streaming video and gaming. ISPs and data plans partially determine the download speed.

Quarterly reports issued by Ookla showed that etisalat by e& recorded the fastest median download speeds across both mobile and fixed, at 216.65 Mbps and 261.98 Mbps, respectively, in Q2 2023. Meanwhile, du's median download speed was 154.02 Mbps.

The mobile multi-server latency results in Q2 2023 showed that etisalat by e& registered the lowest median multi-server latency at 35 ms, while du registered at 39 ms.

In measuring the consistency of each operator's performance, there was no statistical winner for consistency, with du at 94.3% and etisalat by e& at 93.4%.

Regarding testing of 5G connections, etisalat by e& had the fastest median 5G download speed in the UAE during Q2 2023 at 680.88 Mbps and du at 453.97 Mbps.

Salam Explores Integrated Digital Hub With Industry Partners in KSA

Integrated Telecom Co. Ltd. (Salam) has teamed up with Khazzan Information Technology Co. (EDGNEX Data Centers by Damac) that designs, builds and operates data centers across the Kingdom, along with Cinturion Corp Ltd., a global provider of integrated submarine and terrestrial capacity-based network solutions, and Emaar, The Economic City (EEC), the master developer of King Abdullah Economic City (KAEC), to sign a strategic Memorandum of Understanding (MOU) agreement in the area of Telecom & Digital Infrastructure while contributing to the Saudi 2030 Telecommunication Transformation Vision led by the Ministry of Communication and Information Technology (MCIT).

The parties have identified a common interest in exploring the opportunity to develop a digital infrastructure hub that will include initiatives such as an international submarine cable project, data centers, fiber infrastructure, cloud and Internet, among others, and the building of a seamless and innovative digital experience in KAEC that aims to become an intelligent national city contributing to the transformation program and accelerating the digital economy and quality of life programs under #Vision 2030.

"As a recognized Telecom & ICT Service provider, Salam is delighted to participate with distinguished parties in this strategic initiative that goes in line with the Saudi National Digital Economy Strategy and Salam's transformation plans. Creating an Integrated Digital Hub enables multi-services to all targeted customers, national and globally, from one place," said Ahmed Al-Anqari, chief executive officer at Salam.

The Edge of Industrial Internet

The industrial internet is a term that can easily sound misleading. For most, it is industry plus the internet. However, the fact is that the traditional internet as an instrument cannot meet the high requirements of industries. The massive amount of data processing needed for the smooth functioning of various company-related operations cannot afford a lag in connectivity at any cost. New technologies such as IoT, edge computing, machine learning and AI, which are incorporated into industrial operations, generate a high volume of unstructured data that needs efficient sorting to derive genuine value from it. Thus, the industrial internet provides a breakthrough option for new development in the industry sector.

The industrial internet is a network of advanced tools and instruments in an intricate web of smart communication technologies. It powers smarter and faster business decision-making for industrial companies. It is set to be key for businesses going through digital transformation. IP technologies, such as 5G, F5G and intelligent cloud networks, are seen as important elements in the evolution of next-gen information technologies, opening up various new business opportunities. However, the technology of traditional industries is complicated with unique standards and procedures, resulting in information silos. The whole process of digitalization is to integrate data into the entire industry as a factor of production, from R&D to design to intelligent manufacturing to service and maintenance, etc. The industrial internet can offer key support for the Fourth Industrial Revolution by synergizing with ICT capabilities.

According to the Huawei-backed white paper, "connected devices and IP networks" will enable the flexible, end-to-end networking of IT and OT, creating a network base for a fully connected industrial internet, which will increase available data and computing power crucial for the industrial internet to develop rapidly.

Path to Industrial Digitalization

Just like roads connect and give access to various interlinked areas, internet connectivity provides access to various connected entities in the industry setting.

In the industrial internet ecosystem, networks are the foundation, platforms are the core, data is a key element, and security provides assurance. Strengthening network infrastructure is the first and most important task in industrial internet development.

Many industrial businesses face constraints such as technological lag, weak data infrastructure and cybersecurity issues, among others. When a company decides to undergo a digital transformation by successfully applying the industrial internet, experts recommend the following:

- Traditional industrial wired networks and Wi-Fi networks can create challenges in terms of reliability and synchronization. 5G-era factories will benefit from high-speed and low-latency 5G connections that can

drive the digital transformation of production lines.
- Gigabit optical networks based on 10G PON and Wi-Fi 6 provide strong support for various new applications in industrial internet settings.
- For the provision of deterministic latency for key services, the industry recommends IPv6+ (SRv6) for constructing industrial extranets. As an intelligent IP network technology for the cloud era, IPv6+ meets requirements for flexible networking, fast service provisioning, intelligent route selection, simplified network O&M and differentiated assurance.

The Need for Industrial Internet

With the improvement of internet technology and the further development of information technology and digital technology, the industrial internet has achieved great results. Industries are the key drivers of economic growth and prosperity, and the industrial internet will be the growth engine for the digital economy. It will help businesses improve their efficiency, lower costs, provide better services to customers and become more competitive.

The UAE's Ministry of Industry and Advanced Technology (MoIAT) has announced the Fourth Industrial Revolution Programme, called "UAE Industry 4.0," to help encourage innovations in 4IR technologies, placing the UAE at the heart of the global Fourth Industrial Revolution. The MoIAT will be collaborating with 12 industrial entities that will form the Champions 4.0 Network and the Departments of Economic Development of Abu Dhabi, Dubai and Ajman to accelerate UAE Industry 4.0.

Moreover, rapid industry automation has led to the trend of "Lights Out" factories that enable production with minimal or zero human intervention, resulting in efficient utilization of human capital and saving operational costs. The successful operation of these factories will require synchronization among multiple manufacturing assets to effectively process the production deliveries. This change is set to reverse the role of humans in factories to be better geared for quality control, planning, maintenance and logistics.

The agenda to speed up the transition from dirty to clean energy is gaining massive momentum. According to the International Energy Agency (IEA), under current policy trends, one-third of the rising energy needs in emerging and developing nations over the next decade will be met by burning fossil fuels, the main driver of global warming. More than 90% of the increase in clean energy since the Paris Agreement in 2015 comes from advanced economies and China, and only 10% from emerging and developing countries. As such, these emerging and developing economies will face tremendous challenges in living up to the expectations of climate change action goals. And the operation of energy-efficient industries will figure in the priorities of all these nations.

Some Areas of Concern

With the massive amount of data collection and analysis at play to run today's industry operations, the capacity of current semiconductors may not be sufficient to process the data explosion that is expected from digital transformation. From imaging devices in cell phones to high-speed CPUs in data centers, the datasphere is highly dependent on advances in semiconductor technology and capacity.

Another bottleneck in the development of industrial internet use, according to experts, is that the majority of potential customers do not know exactly what to expect from the technology. The need for collaboration with the customer segment to review the design phase and bring the services and products to market can be taxing and tedious given the volatility of supply chains.

Tech Enablers

To that end, innovative companies are focused on the rapidly evolving digital transformation of the industry sector. For example, Ericsson has developed a new 5G radio access network (RAN) software solution whereby CSPs can offer more connectivity options for diverse consumer and enterprise use cases and in industrial settings on the Frequency Division Duplex (FDD) and Time Division Duplex (TDD) spectrums. Ericsson RedCap will support devices with reduced complexity, such as low-end augmented reality (AR) wearables, video surveillance equipment, industrial sensors and smart grids. The company claims the new solution is more energy-efficient than existing LTE categories.

Similarly, by the end of 2022, Nokia had deployed mission-critical networks to more than 2,600 leading enterprise customers in the transport, energy, large enterprise, manufacturing, webscale and public sector segments around the globe. It also boasts over 560 private wireless customers worldwide across industrial sectors and has been cited by industry analysts as the leading provider of private wireless networking worldwide.

Furthermore, the country's two telecom operators, e& and du, have consistently played their role in accelerating digital transformation to explore how 5G with focus on 4IR technologies such as artificial intelligence, cloud computing and the Internet of Things to facilitate innovation for the manufacturing sector, strengthen global supply chain networks, promote sustainable economic growth and contribute to the UAE's industrial strategy

As ICT and industrial application know-how develop, Huawei's observations on future industrial internet evolution will comprise the following:

- Constant upgradation of ICT technical standards and solutions
- Further integration of new technologies such as 5G, AI and cloud into industrial settings
- Lowering the cost of industrial modules with the increase in industry size
- Government-backed promotion by large companies to continually enrich industrial applications
- Industry sector promotion for the development of industrial internet applications

Though some concerns and misgivings persist, the path is clear. The industrial internet will fuel the digital transformation of industry moving forward. Its future is now. TR

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.

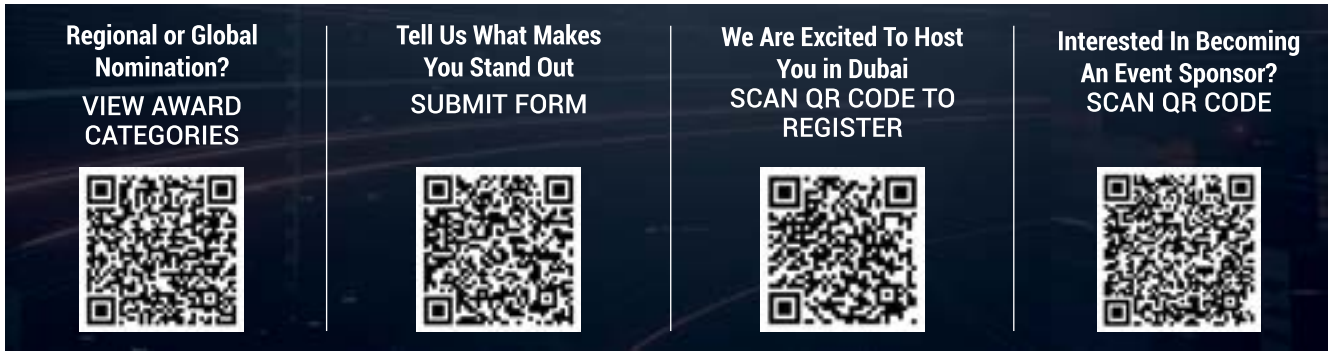
The Telecom Review Excellence Awards will be open for nominations since June 20, 2023. All details for submitting the nominations can be found by scanning the QR code below (Submit Form).

The complete list of awards is also available by scanning the QR code below (View Award Categories). 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.

We look forward to receiving your nominations by September 30, 2023! TR



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Premium Connectivity: Unlocking the Power of Connectivity for All

In today's digital age, the success of any service is heavily reliant on the quality of connectivity that supports and enables it. The concept of better or "premium" connectivity varies depending on the targeted user experience and the service characteristics. It can range from basic internet access to sophisticated and critical operations in advanced industrial settings. User experience forms the foundation of service success, and quality perception plays a vital role in commercial operations. Connectivity, much like water, is an essential resource that empowers individuals by providing access to knowledge and connecting them to the world. I'd like to explore the significance of premium connectivity and its transformative impact on society.

Connectivity as Water

To understand the role of connectivity, let's draw a parallel with water distribution. Just as water is distributed through an extensive network of pipes, our mission at Nokia Network Infrastructure (NI) is to connect users to the cloud or service sources. This connection will be established through various means, such as radio access and fiber access, consolidated in metro and regional networks, and most likely transported through international terrestrial and subsea cables for thousands of kilometers. Connectivity, like water, flows in both directions; this digital connectivity flows both upstream and downstream in the same infrastructure, connecting users to the cloud and back. While water reaches our homes through a complex network of pipes connecting dams, rivers and lakes, connectivity links individuals to the global network of data centers that form the cloud.

Multi-Service, Multi-Directional Connections

Connectivity is not limited to a single service or direction. Connectivity today supports a multitude of services and facilitates connections in all directions. Like opening a tap to connect with the water supply, individuals can connect themselves or their locations to the cloud and/or other users. The volume and pressure of water required vary depending on the need, and connectivity follows the same principle. Whether we require a small amount of data or a massive transfer at high speeds, premium connectivity ensures that diverse requirements are met. Moreover, premium connectivity enables mobility, allowing individuals to carry their "tap" of connectivity wherever they go, catering to their specific needs and preferences.

To make the comparison a bit more complex, digital connectivity not only connects but, like water, flows at different pressures, providing a rich set of digital services (data, video, voice, signaling, IoT) that require specific "treatment" during its transportation/storage to be used properly. Different levels of latency, QoS and resiliency are required while always being expected to do it in a sustainable and secure manner (privacy).

Bridging the Digital Divide

In our pursuit of premium connectivity, our aim is to create multi-service, multi-directional connections on a single infrastructure. The goal is to maximize utilization, fulfill business cases, and most importantly, ensure social impact via digital inclusion. Our vision is to transform the digital gap into a digital opportunity. This inclusivity-driven approach applies to all markets, from consumers and residential users to small and large enterprises across industries. Sustainability, green, social development, and digitalization are interconnected concepts. Without reliable and affordable connectivity, there can be no business case, digital adoption, and progress towards a green and inclusive future.

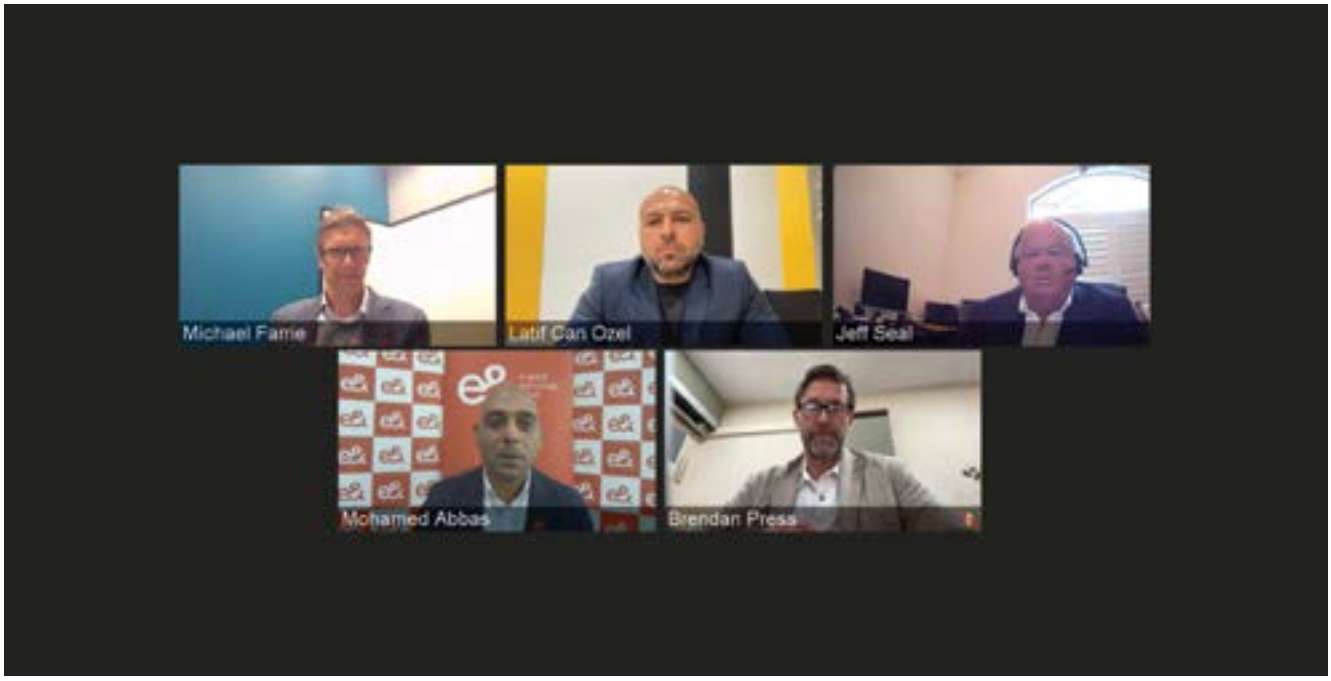
Premium Connectivity: Differentiation and Value

Premium connectivity is not defined by its price; it is determined by the added value it brings to services. It can range from providing widespread, affordable basic access to the internet up to ensuring secure critical missions or very specific use cases for life-saving actions. Premium connectivity adapts to the requirements of various services and sectors, such as medical remote interventions, mining critical operations, safety disaster recovery and more. The exponential power of networks lies in their ability to connect society, as exemplified by their role during the COVID-19 pandemic. Beyond business-oriented applications, premium connectivity can also drive initiatives like disaster recovery, education, healthcare and social inclusion, creating a positive impact everywhere. It is probably the most important development tool in our society.

Premium connectivity acts as the cornerstone of digital transformation, enabling individuals and organizations to leverage the vast potential of the digital world. By bridging the digital divide and providing reliable and affordable connectivity, we can empower communities, foster social sustainability and drive inclusive growth. Just as water connects the lakes of the mountains to taps worldwide, premium connectivity connects individuals, organizations and societies, ensuring that no one is left behind in the pursuit of a better, connected future. TR

By: Roque Lozano, Sr Vice President, Networks Infrastructure (NI), Nokia, Middle East and Africa (MEA)

Sustainability, green, social development, and digitalization are interconnected concepts. Without reliable and affordable connectivity, there can be no business case, digital adoption, and progress towards a green and inclusive future



Telecom Review Virtual Panel, 'Increased Data Boosting Wholesale Capacity'

Telecom Review has successfully concluded its latest webinar titled "Increased Data Boosting Wholesale Capacity," which gathered industry experts to discuss the importance of wholesale capacity in enhancing international telecommunications infrastructure projects and other services.

Jeff Seal, Editor-in-Chief and Managing Partner of Telecom Review North America, was the moderator of the panel, which featured executive panelists, including Brendan Press, Chief Commercial Officer, GBI; Michael Farrie, Director, Partner Solutions Groups, Verizon; Latif Ozel, International Section Director, IQ; and Mohamed Abbas, Director, Hyperscalers Businesses, e&.

Wholesale's Obstacles

Seal opened the discussion by addressing the current obstacles hindering the acceleration of wholesale growth in terms of regulations, bandwidth capacity and latency. Brendan Press of GBI acknowledged industry growth driven by leading players serving consumers and businesses. However, new infrastructure is needed to sustain this growth. While there is investment, delays and challenges in securing resources and forming alliances persist. Press emphasized coordination among markets and regulatory developments.

Additionally, Latif Ozel of IQ highlighted the various obstacles hindering the acceleration of wholesale growth, particularly in terms of regulations, bandwidth capacity and latency. He emphasized that regulatory frameworks and policies differ across regions due to variations in history, politics, the economy and social status. This lack of

collaboration and shared vision creates complexity and barriers for wholesale providers to cooperate effectively and ensure efficient business operations. To address this, Ozel proposed the standardization of regulatory frameworks based on generic parameters such as culture, population, geography and economic capabilities.

Michael Farrie of Verizon emphasized the impact of evolving technology on the emergence of various services and the subsequent increase in data volume. However, this technological advancement also gives rise to an increase in threats, necessitating compliance with network standards and regulations. The complexity of regulation and licensing requirements poses a significant and costly challenge, both in terms of time and intellectual navigation. The competitive landscape, especially with the rapid growth of hyperscale entities, adds an element of uncertainty to determining the necessary network capacity and ensuring a satisfactory return on investment. The pricing must align with consumer expectations. Moreover, environmental compliance, rising energy costs, inflation challenges and supply chain issues further complicate the steel structures.

Mohamed Abbas of e& also answered this question by highlighting the challenges faced by telecom and wholesale providers in navigating complex regulatory frameworks across countries. Compliance with regulations can be costly and time-consuming. The UAE's collaboration between the regulatory authority and telecom operators has positioned it as a tech hub. Wholesale providers must address bandwidth challenges and invest in infrastructure upgrades. Abbas emphasized reducing latency by establishing terrestrial routes and localizing content. e& has been a pioneer in achieving 73% traffic localization in the UAE.

Issues in Establishing a Growing Network Environment

Moving on to the next topic, Abbas discussed the expansion of digital infrastructure, including 5G networks, fiber optic networks and cloud computing. The UAE leads in FTTH penetration and has made significant progress in network technology, reducing latency and improving performance. e& hosts major hyperscalers, reducing the need for submarine cables. Although there's more work to be done in areas with limited connectivity, the overall trend is towards a faster and more reliable digital environment.

Moreover, Ozel added the importance of submarine cables for global connectivity but acknowledged challenges like operating costs and the need for low latency. Terrestrial alternatives provide diversification, redundancy and uninterrupted connectivity. They offer simplified installations, repairs and low-latency connections, enhancing data transmission speeds. Consortiums play a crucial role in spreading financial risk and leveraging technical knowledge. IQ Network's Ebro Transits project reduces delays and offers a promising alternative for improved connectivity.

In addition, Farrie highlighted the increasing global demand for connectivity, comparing it to a runaway train. Different regions experience varying growth rates, with Africa showing potential. Content providers are building their own networks in the cloud-based environment, creating opportunities for carriers to expand the ecosystem. The deployment of submarine cables will bring a significant amount of capacity online. However, land-based connectivity poses challenges, and there is uncertainty about the need for additional infrastructure.

Press emphasized the importance of diversity in connectivity. GBI, as an infrastructure provider, is investing in new routes to offer alternatives and reduce dependency on specific paths. This allows for low-latency north and south route solutions, ensuring uninterrupted services. The focus is on providing 100% service continuity and cost-competitive hosting capabilities. Press sees this approach as the core of their business, ensuring innovation and meeting customer needs effectively.

Innovation as a Growth Engine

On this topic, Abbas said that the wholesale industry overall is constantly evolving and that new digital solutions and business models are emerging to keep up with the changing market demands. "We have seen that some of the latest trends and the launch of the new digital solutions and business models in the wholesale industry include some of the new digital business services that are not limited to that, including e-commerce platforms to reach a wider audience and streamline their operations. This allows customers to easily place orders and track their deliveries online. We were the first regional operator to offer a telecom and e-commerce platform to help regional and domestic merchants and customers in their daily transactions."

Ozel noted that the IoT was continually driving innovation in the ICT industry. He said that the challenges of deploying IoT solutions relating to standardization protocols, device installation, etc. have been minimized over the years. "But today, most of these challenges have been tackled, and the capacity required for a device is usually not substantial. Considering millions and even billions of devices, it can generate huge amounts of data," he explained. With this, he shared some stats from July 2023 that showed approximately 15 billion connected IoT devices worldwide, with the figure expected to almost double to 30 billion by 2030, with the top five leading countries being China at 5.2 billion, the US at 3 billion, India at 2 billion, Japan at 1.8 billion and Germany at 1.6 billion.

Farrie agreed with others that innovation in the wholesale space was critical and that the need to evolve the revenue line in essentially legacy-based operations was top of the agenda. However, he pointed out that there is a risk in "trying to be all things to all customers." Drawing from the vast experience of Verizon, Farrie said that fixed wireless access, video conferencing and automation were key to delivering the goods in a new business model set up for the wholesale industry.

He explored at length the value of wireless connections in sectors such as industrial, health and education, among others, through platforms like BlueJeans video conferencing solutions.

Press explained that GBI is focused on its core business of building infrastructure. "If we don't provide the platform, the capacity, the continuity of service and the routine for latency and hosting, our business will take a hit. We are entering into a great partnership with Meta, providing localized services with low latency not just in Qatar but across the Middle East region. We are developing a new route into Europe that allows new services to be accessible, so people playing games in the region don't have to access content outside the region and can have a better experience. We believe the core business is ensuring the ongoing and continual processes in infrastructure, especially in a region where infrastructure is built, and ensuring that we can be a trusted partner so that other players that deliver top-notch services can see the benefits."

Importance of New and Geographically Redundant Data Centers

Farrie talked about the demand to build more data centers and how important it is. He stated: "We sort of think about some of the key industry themes like virtualization, security and sustainability that really influence the industry; we see an exponential increase in cloud applications from big enterprises right down to small businesses. So all of those applications go off to the cloud, and that would create more storage data that is basically implemented in a secure environment. So to that extent, there will always be a need for more data centers."

As for Ozel, he agreed with his colleagues on bringing more data centers because they are critical infrastructure for storing, processing and delivering digital services. They provide the necessary computing power, storage capacity and network connectivity required for businesses to operate, and data centers enable businesses to enhance their digital capabilities, improve data security and achieve high availability for their services.

Abbas believes that the implementation, expansion and development of the data center business are very important and are key to any telecom provider's growth, specifically on the wholesale front. The data center business is a massive part of Verizon's business, noted Farrie. He would add that it's the same on e&'s end as well. The data center business is a massive part of it, and that's why they have extended their data center footprint and continue to do so every day, which is aligned with their leadership's long-term vision of creating a digitally empowered region within the UAE through innovation and digitization.

As for Press, it's very important that they also ensure neutrality from the telecoms perspective, because data centers are built without neutrality in single-operator service and because that's been the only way Press thinks it has happened. Press stated his belief that the growth for all players mentioned earlier — the overall wholesale market, as an example — is the same for data centers. He feels those who are investing in service operations or center providers need that neutrality. "We've seen that stuff go back to regulations and discussions of where the market is in terms of the provider."

Upcoming ICT Projects

Moving on to the upcoming ICT projects for each company and in each country, Abbas mentioned that every company should welcomely initiate new projects: "We are very excited about the opportunities ahead and about the impact we can make in the lives of our customers. We have made significant strides in artificial intelligence, and we are aiming to deliver a groundbreaking and personalized experience."

Several projects were planned by Verizon as well. With this, Farrie detailed: "We've built our network, known as IEN, and we are doing a lot in autonomous retail."

Ozel highlighted that IQ is working on many ICT projects, like building two centers in Iraq. They are greatly focusing on green initiatives, implementing Solar Panels, for example.

For Press, the most important thing is how the existing network evolves. "Connection with new cable is the essence of the core of our business". He underscored that partnerships are critical to GBI.

Finally, regarding a poll question asking what are "Suppliers' Main Challenges," 14% of the audience voted for "Develop Innovative Pricing Offers," with 36% choosing "Reduce Time to Delivery," 7% picking "Improve Service Resilience and Recovery," and a winning 43% choosing "Provide Consistent and Powerful Portals and B2B Interfaces." TR

> The deployment of submarine cables will bring a significant amount of capacity online

Charting a Course to Safety: The Vital Role of Radiocommunications at Sea

Since the Titanic sank in 1912, the international maritime community has been committed to faster, more reliable and more efficient radiocommunication systems and services, both between ships and with stations on shore.

This tragic event highlighted the importance and necessity of efficient maritime communications as well as the need for standardized protocols and procedures for distress signals. It led to significant improvements in maritime safety regulations, including the establishment of 24-hour radio watch on vessels and the development of the International Convention for the Safety of Life at Sea (SOLAS) treaty, which mandated the provision of sufficient radio equipment on ships for distress communications.

Established in Geneva in 1948, the International Maritime Organization (IMO) sets global standards for radiocommunications in shipping through SOLAS, itself adopted in 1974. In particular, the Global Maritime Distress and Safety System (GMDSS) outlines the requirements for shipborne radio equipment and systems and ensures that a ship in distress at sea will always be heard and responded to, regardless of its location.

In addition to the distress and safety aspects, radiocommunications have also become an integral part of commercial shipping operations. Today, there is an intensified demand from the maritime industry for greater connectivity and higher data capacity to support all maritime operations.

What's Coming in WRC-23

Maritime transport serves as the lifeblood of global trade, with approximately 80% of the world's merchandise being transported by sea. Over the years, radio communication has become a vital tool to declare a ship's travel intentions, share its positions and avoid potential collisions.

In line with the International Telecommunication Union's (ITU) efforts, there is a great reliance on radio, radar, electronic systems and satellite navigation within the waters. These technologies not only facilitate operational communication but also enable seafarers to stay connected with their families and loved ones. In emergencies, radio distress signals are crucial in alerting search and rescue services.

The ITU has played a significant role in the development of terrestrial radio navigation systems that enhance safety at sea. This includes advancements in maritime radio beacons, terrestrial positioning systems operating in medium frequency (MF) bands, radar beacons and satellite positioning systems. These developments align with United Nations Sustainable Development Goal 9, which focuses on industry, innovation and infrastructure, including the enhancement of safety, security and comfort at sea.

As the World Radiocommunication Conference 2023 (WRC-23) approaches later this year in Dubai, expectations regarding the topic of maritime communications are high. Efforts are underway to improve existing systems and introduce new technologies to enhance safety, protect the maritime environment and optimize cargo transportation. The ITU-R studies, along with the resulting recommendations and reports, will provide valuable support for these endeavors.

"When ITU Member States update the Radio Regulations Treaty at WRC-23, they are expected to consider the modernization of the Global Maritime Distress and Safety System (GMDSS), the introduction of e-navigation systems, and other maritime communication issues. These changes should enable the industry to respond to emerging trends in maritime communications, including the transition to digital technologies and wireless applications," says Mario Maniewicz, Director, ITU Radiocommunication Bureau.

GMDSS Modernization

The Global Maritime Distress and Safety System stands as a universally embraced framework encompassing a wide array of safety procedures, frequencies, equipment types and communication protocols. Developed through a collaboration between the IMO and ITU since the mid-1970s, it integrates terrestrial and satellite radio technologies on ships and onshore, facilitating the rescue of distressed individuals, ships, boats and aircraft. In situations of distress and emergency, the system notifies rescue and communication personnel at coast radio stations or Rescue Coordination Centers (RCC) and establishes contact with nearby vessels for assistance.

In light of a comprehensive evaluation of the GMDSS, the Maritime Safety Committee (MSC), during its 105th session, adopted several resolutions to finalize the modernization efforts and enable the future incorporation of advanced communication systems in the GMDSS while eliminating outdated requirements. These amendments are expected to come into effect on January 1, 2024.

While Inmarsat and Iridium have been recognized as GMDSS satellite operators, China's BeiDou has applied for recognition and could potentially become a third operator in the future, pending decisions during WRC-23.

Furthermore, there may be future modifications to providers of Maritime Safety Information (MSI), such as the possible replacement or complementation of Navigational Telex (NAVTEX) by Navigational Data (NAVDAT), a digital system operating in MF/HF maritime bands for the broadcast of safety and security information.

An emerging trend in maritime communications is the VHF Data Exchange System (VDES), developed by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). VDES aims to enable seamless data exchange within the maritime community and incorporates components such as the Automatic Identification System (AIS), Applications Specific Messages (ASM), VDE terrestrial component and VDE satellite component. The incorporation of the VHF Data Exchange System (VDES) into the broader e-navigation initiative holds tremendous potential for revolutionizing various aspects of maritime operations. By seamlessly integrating VDES into the e-navigation framework, we can unlock a multitude of applications that will not only bolster navigation safety but also elevate environmental conservation efforts, optimize shipping efficiency and transform maritime information services such as Aids to Navigation (AtN) and Vessel Traffic Service (VTS). This convergence of technologies promises to shape the future of maritime communication and pave the way for a more secure, sustainable and efficient maritime industry.

In a similar vein, automatic link establishment (ALE) technology has been developed to enable the automatic selection of frequencies for networked or point-to-point communication in the absence of operator intervention. This advancement, utilizing microprocessor control, encompasses features like automatic signaling, selective calling, automatic handshaking, channel scanning and selection, sounding, and message store-and-forward capabilities. These automated functions have particular relevance in the marine sector.

The future of the GMDSS Modernization Plan is intrinsically linked to the progress of the e-navigation project and the crucial role of radiocommunication in this endeavor. Undoubtedly, the establishment of a robust and resilient

data communication network will be a fundamental aspect of the e-navigation implementation following WRC-23.

E-Navigation

Moving forward, in alignment with IMO's strategic implementation plan on e-navigation, the next step is to introduce digital communication systems that support S-100 format files. A comprehensive analysis of e-navigation has revealed the necessity of presenting information in a graphical format, addressing the need for enhanced data visualization.

According to the IMO, e-navigation encompasses the harmonized collection, integration, exchange, presentation and analysis of marine information through electronic means. Its ultimate goal is to enhance berth-to-berth navigation, safety and security at sea, and environmental protection. To achieve this, e-navigation envisions the provision of digital information and infrastructure, enabling seamless communication links between ships and shore facilities. This entails utilizing high-speed broadband data connections to update computerized bridge displays with real-time information.

When it comes to e-navigation, there are specific expectations concerning the elements present onboard and ashore, as well as in terms of communications.

Onboard: The primary focus lies in navigation systems that capitalize on the integration of sensors within the ship, along with supporting data, a standardized user interface and a comprehensive system for managing guard zones and alerts. An essential component of such a system is actively involving mariners in the navigation process, empowering them to efficiently perform their duties while minimizing distractions and cognitive overload.

Ashore: The administration of vessel traffic and associated services undergoes a significant boost thanks to the enhanced provision, coordination and exchange of comprehensive data presented in user-friendly formats. These carefully designed formats guarantee that onshore operators can effortlessly grasp and leverage the information to fortify vessel safety and maximize operational efficiency.

Communications: The e-navigation infrastructure facilitates authorized and seamless information transfer onboard ships, between ships, between ship and shore, and among various shore authorities and other relevant parties. This robust communication network brings forth numerous benefits and opportunities for collaboration and coordination.

By embracing these principles, the maritime industry can navigate towards a future where digital communication systems, data integration and seamless information transfer revolutionize navigation, safety and operational efficiency at sea. TR

Ooredoo Group Records 20% Net Profit Increase in H1 2023

Ooredoo announced its financial results for the first six-month period of 2023. Among the highlights are figures showing strong year-on-year (YoY) revenue growth of 3%, reaching QAR 11.4 billion; a healthy EBITDA of QAR 4.8 billion with a margin of 42%; exceptional 20% YoY growth in normalized net profit, reaching QAR 1.6 billion; and an expanded customer base (including IOH) to 156.2 million, a solid 3% YoY growth.

Commenting on the results, H.E. Sheikh Faisal Bin Thani Al Thani, chairman of Ooredoo, said: "Ooredoo Group concluded the first half of 2023 with an outstanding performance, recording revenue of QAR 11.4 billion and a remarkable surge in normalized net profit, reaching QAR 1.6 billion. These impressive achievements underscore our steadfast dedication to providing robust connectivity, exceptional customer experiences and maximizing value for our stakeholders.

Looking ahead, we remain committed to exploring strategic avenues that unlock significant capital and maximize value for our stakeholders, further solidifying our position as a leader in the industry," Al Thani concluded.

Also sharing his perspective on the company's positive performance, Aziz Aluthman Fakhroo, managing director and CEO of Ooredoo, said: "This strong set of results validates our strategy, which places operational excellence and customer service at its core. Notably, our normalized net profit increased 26% in Q2 YoY, and we remain on track to achieve our guidance targets for 2023."

Ooredoo Kuwait delivered a solid 4% YoY growth in revenue, reaching almost QAR 1.5 billion, while Asiacell achieved strong revenue growth in H1 2023, with a YoY increase of 16%, reaching more than QAR 2 billion. In addition, Ooredoo Algeria delivered an 8% increase in revenue during H1 2023.

"We are making significant progress on executing our strategy and are well on track to achieve our guidance targets. We continue to strengthen our position as a leading telecommunications company striving to deliver competitive services to our customers and exceptional value to our stakeholders," stated Fakhroo.

Under a value-focused portfolio, Ooredoo, Zain and TASC Towers Holding recently entered exclusive negotiations to create an independent tower company comprising up to 30,000 towers. This transaction will create a potential uplift in both Ooredoo Group's and Zain Group's enterprise value through a more efficient capital structure.

e& Reports Consolidated Revenues of AED 26.6 Billion for H1 2023

e& has announced its consolidated financial results for H1 2023.

e&'s consolidated revenues during H1 2023 reached AED 26.6 billion, a YoY increase of 1.1%. Consolidated net profit recorded AED 4.7 billion, while consolidated EBITDA reached AED 12.8 billion, resulting in an EBITDA margin of 48%. The Board has approved an interim dividend of 40 fils per share for H1 2023.

In the UAE, etisalat by e& recorded 13.9 million subscribers, an increase of 5.1% compared to the same period last year. The Group's aggregate subscribers reached 165 million, a YoY increase of 3.1%.

H.E. Jassem Mohamed Obaid Bu Ataba Alzaabi, chairman, e&, said, "e&'s performance during the first half of the year reinforces the resilience of our business model despite the challenging global macroeconomic environment. This was also the result of our team's relentless efforts to remain committed to our vision and drive sustainable growth, making a positive change in the societies we serve while adding value to our shareholders.

Meanwhile, Hatem Dowidar, Group CEO, e&, added, "Over the past six months, we have demonstrated a strong sense of resilience and adaptability. Our relentless focus on excellence and innovation has allowed us to thrive in the dynamic landscape of the telecommunications and technology sectors, maintaining our growth momentum.

"Our success has been driven by the combination of our innovative, customer-centric strategies and the unwavering dedication of our teams, along with our investment in world-leading infrastructure and cutting-edge technologies that consistently serve as the foundation of our achievements.

"I would like to express my gratitude to our dedicated employees, whose relentless efforts and innovative spirit remain the driving force behind our progression. Similarly, we thank our loyal customers and stakeholders for their continued faith in our vision. Looking ahead, I remain confident that our commitment to connecting people, businesses and communities through technology will enable us to provide continuous growth and value for our customers and stakeholders in the years to come."

EITC (du) Reports 31.2% Jump in Net Profit for Q2 2023

Emirates Integrated Telecommunications Company (EITC), also known by its brand name "du," announced its financial results for the quarter ended June 30, 2023. The company reported service revenue growth of 8.9% on the back of strong demand for postpaid mobile and fixed services. Total quarterly revenue reached AED 3.35 billion, according to the company statement.

Financial Highlights:
Revenues grew 6.7% to AED 3,347 million. Mobile service revenues recorded a 7.6% expansion to AED 1,513. Fixed services revenues grew 10.9% to AED 948 million following sustained demand from consumer and enterprise customers. In aggregate, service revenues increased by 8.9% to AED 2,461 million. Other revenues grew by 1.1% to AED 885 million due to healthy growth in roaming services as well as ICT services fueled by demand for security, data center and cloud services.

Net Profit jumped 31.2% to AED 397 million, primarily due to higher EBITDA and excellent management of the cost base. These were partially offset by an increase in royalty expenses and higher D&A charges.

Operating Highlights:
The company's mobile customer base grew 8% year over year to 8 million subscribers while tapering over the quarter. Unlimited data plans and growing demand from the enterprise sector delivered the eighth consecutive quarter of postpaid net additions (13,000). The prepaid customer base grew 7.4% yoy to register 6.5 million customers, despite declining over the quarter, reflecting the typical seasonality impact.

Fixed offering continued its growth with 559,000 broadband customers, representing 18.3% growth year-over-year. The continued expansion of the fiber network and the disciplined execution of broadband strategy supported another quarter of steady performance.

On the basis of these results, the Board of Directors approved the distribution of an interim half-year cash dividend of AED 0.13 per share.

Commenting on the report, Malek Al Malek, EITC Chairman, said, "Amid the burgeoning UAE economy and robust non-oil sector performance, we have persevered in sustaining our momentum, yielding an exceptional array of results. I take great pride in our proactive and dynamic commercial strategy, coupled with our unwavering dedication to excellence that has catalyzed EITC to ascend to new heights and spurred strong performance across all key financial indicators."

Meanwhile, Fahad Al Hassawi, CEO at du, added, "Our strategic, commercial and investment initiatives have yielded a high growth of 8.9% in our service revenues, making a significant contribution to our improved EBITDA and overall profitability. This success is a testament to our continuous commitment to creating shareholder value for our shareholders through enhanced profitability and a stronger market position. We remain resolute in our disciplined cost management approach and our dedication to investing in high-growth opportunities. This unwavering focus drives our transformation journey as a digital-first telecom operator committed to delivering an unparalleled customer experience. I take immense pride in our sustained commercial vitality and the role it plays in achieving our goals."

Vodafone Names Luka Mucic as Group Chief Financial Officer

Vodafone Group Plc (Vodafone) announces the appointment of Luka Mucic as Chief Financial Officer and as Executive Director of Vodafone, effective September 1, 2023.

Luka Mucic was the Chief Operating Officer of SAP SE from 2014-2017 and its Chief Financial Officer from 2014 until 31 March 2023. During these roles, he was responsible for SAP's groupwide Finance, Legal, Data Protection, Procurement, Audit, Risk Management, Security, IT and process management functions.

Margherita Della Valle, Vodafone Group Chief Executive, said, "I am thrilled that Luka will be joining the Vodafone team. He has a strong track record of international leadership, corporate repositioning and value creation. Luka is joining us at a critical time as we undertake the transformation of Vodafone."

Luka Mucic said, "I am very excited to be joining Vodafone at this important stage of the Group's development. I look forward to working with Margherita and the team in delivering Vodafone's strategic priorities of Customers, Simplicity and Growth."

Jean-François van Boxmeer, Vodafone Group Chair, said, "Following a rigorous international and cross-sector search, I am delighted Luka is joining the Board. He brings with him extensive experience in finance, international business — particularly in Germany — and technology."

solutions by stc Signs Major Agreement With Public Utilities Company

solutions by stc, the specialized business arm of Kuwait Telecommunications Company — stc, has won the tender to provide the Public Utilities Management Company (PUMC) with a comprehensive ticketless parking management solution throughout its various parking locations across Kuwait.

solutions by stc indicated in a statement that the project involves the installation of a state-of-the-art end-to-end smart Parking Management System in collaboration with its partners. This important step signifies a significant milestone in accelerating the development and operation of truly smart parking solutions in Kuwait. As part of solutions by stc's strategic plans to expand these solutions, this project aims to transform the company into an inclusive digital telecommunications provider, ultimately fostering the nation's digital transformation and driving progress in the country.

Moreover, the solutions by stc team will collaborate closely with PUMC to implement the comprehensive smart parking system, enhancing the overall experience for visitors and tenants. This system will enable users to effortlessly locate available parking spaces and streamline payments through a mobile app, while smart parking readers facilitate ticketless entry and exit. Enhanced security measures allow PUMC to remotely monitor all parking locations, and the communication solutions offer quick connections to PUMC's customer service team for remote staff and visitors. With all branches connected to the head office, PUMC can maintain real-time visibility into parking usage and revenue, while cloud solutions ensure easy access and backup in the event of any incidents.

Chief Executive Officer of solutions by stc, Mohammed N. Al-Nusif, said, "This project will exemplify our unwavering commitment to delivering innovative and advanced solutions tailored to the ever-evolving needs of our customers. Our partnership with PUMC is a source of great value, and we eagerly anticipate providing a best-in-class Parking Management solution that sets the benchmark in the industry. Throughout the past several years, we have ventured into new dimensions to support the ever-evolving digital transformation strategies of our valued customers. Stemming from our deep understanding of each customer's diverse requirements, we partnered with some of the leading entities in the region and the world to provide an exceptional and value-adding experience."

CTG and ZOI Partner to Revolutionize Global Connectivity

China Telecom Global Limited (CTG) and Zain Omantel International (ZOI) have signed a strategic subsea capacity and connectivity agreement to facilitate the global expansion of both parties' markets in the Middle East and Asia Pacific regions.

This partnership allows the leveraging of ZOI and CTG's exceptional expertise and network capabilities, as well as taking their service offerings to new heights, delivering high-capacity, low-latency data connectivity across China, Kuwait, Oman, Saudi Arabia, Bahrain, Jordan, Iraq, Sudan and South Sudan. It is a significant turning point for the telecommunications sector and is set to usher in a new era of global connectivity and improved customer experiences, fostering innovation and closer ties between people. It paves the way for streamlined and dependable communication.

"Aligned with our worldwide strategy to enhance CTG's foothold in the Middle East, we look forward to collaborating with ZOI to reinforce network assistance for clients and enable enterprises to venture into global markets and stay competitive," said Faming Lu, vice president at CTG. "Especially for those aiming to expand into the Asia-Pacific region, this partnership presents a valuable opportunity to benefit from rapid and dependable connectivity that effectively fuels their business growth. Furthermore, it will serve as a digital gateway for Chinese businesses seeking to establish their operations in the Middle East market, unlocking the vast potential for mutual success."

Sohail Qadir, CEO of ZOI, stated, "As the gateway from the Middle East to the world, ZOI is proud to be CTG's partner of choice in the Middle East for international capacity and subsea streams. This partnership strengthens our position as the global wholesale powerhouse, connecting all Middle Eastern countries to an extensive international network. It also enables us to deliver unrivaled connectivity solutions and wholesale services to businesses across the region."

The strategic partnership between CTG and ZOI marks a significant milestone in the collaboration between the parties. It will revolutionize the way global connectivity is offered and pave the way for more innovative and advanced international telecom solutions.

Staying Vigilant:

Monitoring Online Behaviors That Jeopardize Your Privacy

Internet privacy, sometimes referred to as online privacy, is a subset of data privacy and a fundamental human right. It fundamentally refers to your right to personal privacy when you display, preserve or share information about yourself on the Internet. This information can include both personally identifiable information (PII) and non-personally identifiable information (NPI), such as your online activity. Without Internet privacy, all of your online activities can be tracked and analyzed by third parties.

In other words, Internet privacy refers to a wide range of technologies, protocols and concepts aimed at giving better privacy safeguards to individual users and other parties when utilizing the global Internet. It shows itself in a variety of ways, such as required privacy statements on websites, data sharing limitations, data transparency projects and so on. Consumers value Internet privacy and anonymity, especially as e-commerce grows in popularity. Privacy violations and assault risks are common considerations for every website under development.

Threats to Online Privacy

As individuals around the world face countless threats to the digital landscape, online privacy continues to be an increasingly pressing issue. Ubiquitous government surveillance is the main concern. In the name of national security, the European Commission has put in place a rigorous monitoring system for our online activities. Often, this surveillance extends beyond the public sphere and even into our private conversations. In addition, companies quickly collect our personal information to modify their marketing strategies or sell it to the highest bidder, which further casts a shadow over the web.

Even more worrying, cybercriminals are developing advanced techniques to penetrate computer systems and exploit sensitive data for malicious purposes. The popularity of social media poses a particular threat because each like, share and comment adds a digital folder that can be exploited by those seeking to take advantage. Staying vigilant, informed and proactive is essential to maintaining our online presence and security in the face of such enemies.

The major issues concerning online privacy are straightforward: information mishandling, spying and

> “Without Internet privacy, all of our online activities can be tracked and analyzed by third parties”

location tracking. These are often the ways in which users find their privacy violated online.

Information Mishandling

You must provide personal information to a number of websites on the Internet in order to use their services. These websites frequently save cookies along with your personal information for further use. This data is frequently not secured and thus accessible to anybody. There might be significant repercussions from this improper management of sensitive information. The threats related to online privacy have increased as a result of the current trend toward e-banking and e-business portals. Sharing your bank account information and other sensitive information online creates opportunities for thieves and leaves you open to hackers.

Spying

Many trackers monitor your Internet activity for a number of purposes. Trackers keep track of all of your online activities using a number of tactics, including recording your search history. This gives them a clear picture of who you are and what interests you, violating Internet privacy regulations and making you public property. The majority of the time, this monitoring is carried out only for commercial gain and enables marketers to display ads tailored to your preferences and interests. However, there are times when criminals use this information for nefarious and illegal purposes, endangering your online safety.

Location Tracking

Most Internet users cheerfully share their current location on social media and tag their friends and family in the process. Although it might be exciting and happy to discuss life events with friends and family, this information shouldn't be shared with only them. This information is typically kept on the social media network you are using and stays there permanently without your awareness, even if you might have given clearance through a terms and services agreement. In addition to social networking apps, other programs, such as Google Maps, also request your location. By granting this request, which is unquestionably damaging and hazardous, you are telling the world where you are and what you are going to do next.

Internet Privacy Protections to the Rescue

The rapid increase in digitization has led to a growing demand for ways to protect online privacy. One of the most effective ways is the use of strong and reliable passwords.

A robust password is essential to protecting personal and sensitive data from cyber threats and malicious activity. Creating a strong password involves using a unique combination of letters, numbers and symbols so that it is difficult for anyone to decipher it. In addition, using multiple passwords for different online accounts reduces the risk of a single password being used across multiple platforms. By using these affirmative and informative strategies, people can take charge of digital security and create a safer online environment.

Additionally, the implementation of two-factor authentication (2FA) is a very effective method to strengthen online privacy protection in the face of the need to protect our digital fingerprints.

2FA, which offers an additional level of security, requires both your password and a secondary action to verify your identity, such as providing a digital code generated by a mobile app or sent by SMS. This robust method significantly reduces the risk of unauthorized access to our sensitive data and allows users to actively participate in protecting their privacy. Two-factor authentication is a positive step to guard against increasingly sophisticated cyber threats and protect a user's online presence, which ultimately strengthens trust in the digital world.

Lastly, because online privacy has become an urgent concern for many in today's digital world, there are welcomed and effective measures to protect our information and maintain a sense of security in the vast domain of the Internet.

One option is to use a Virtual Private Network (VPN). VPNs are a powerful tool to protect our online activities. They not only encrypt our data and hide it from others, they also allow us to access websites with limited access and enjoy greater freedom online. VPNs provide a layer of anonymity that allows us to control our online privacy by essentially creating a secure tunnel between our device and the Internet. Therefore, whether we are browsing the Internet from home or accessing websites through public Wi-Fi networks in an increasingly interconnected world, this positive measure allows us to protect our digital rights and personal information. TR

> Staying vigilant, informed and proactive is essential to maintaining our online presence and security

From Algorithms to Dollars:

The Battle to Commercialize Generative AI

In 2022, the world witnessed a groundbreaking shift in Artificial Intelligence (AI) with the introduction of consumer-facing applications like ChatGPT. This marked the emergence of Generative AI, a paradigm shift that has the potential to transform the relationship between humans and technology.

The implications of Generative AI go beyond mere technological advancements; the revolutionary technology also presents an almost unimaginable opportunity for monetization. The demand for AI services is projected to offer significant growth to hyperscale installations and the entire value chain associated with modern data centers. From storage to networking components, the market for AI processors is predicted to reach a staggering $38 billion by 2026, marking a fourfold increase from 2022.

Analysts estimate that the Generative AI market will reach a remarkable $200 billion by 2032, with a doubling growth rate every two years throughout the next decade. But, beyond the numbers, lies a potential economic impact that can far exceed these estimates. Generative AI could transcend the impact of previous technological milestones, such as the cloud, smartphones and the internet. The sky's the limit.

Having said that, questions remain regarding the long-term success of the pioneering companies in this space. Will these first-movers establish household-name businesses, or will they fade away along with the hype? As the race to commercialize and monetize Generative AI intensifies, only time will tell which ones will truly capitalize on the transformative power of Generative AI and create lasting, impactful ventures.

Main Player: Hyperscalers

In the fast-paced race to dominate the Generative AI market, key players such as Microsoft, Google, Amazon, Meta, Baidu and Alibaba are employing distinct strategies to gain a competitive edge. While large cloud computing providers seem to have an advantageous position due to their vast data center resources, it's still too early to declare a clear frontrunner in this dynamic landscape.

The cloud emerges as the ideal platform for the Generative AI breakthrough, with hyperscalers playing a pivotal role. When considering the infrastructure layer, where hyperscalers have established dominance, the business model is well-established, offering scalable computing with transparent, consumption-based pricing.

To solidify the adoption of Generative AI workloads, hyperscalers have entered into commitments with model providers (startups), ensuring a continuous flow of future workloads. Azure's collaboration with OpenAI, Google's partnership with Anthropic and AWS's association with Stability.ai are notable examples of this strategy.

As the race unfolds, hyperscalers can leverage their infrastructure, expertise and partnerships to capture a significant share of the Generative AI market. The maturity of the infrastructure layer gives hyperscalers a headstart, but the evolving landscape offers room for other players to flourish.
The cloud's role in shaping the future of Generative AI cannot be overstated. It provides the scalability, computational power and cost efficiency required for this technology to thrive.

According to GlobalData, the ongoing collaboration between hyperscalers and startups not only fuels innovation but also drives the development of novel Generative AI applications. With the promising potential of Generative AI, the race intensifies, and the strategies of these major players will undoubtedly impact the trajectory of the industry.

Other Players in the Competitive Market
As the Generative AI landscape continues to evolve, stakeholders must navigate the complex dynamics and make strategic investments to secure their positions.

The race to commercialize and monetize Generative AI has ignited fierce competition within the industry, leaving a crucial question unanswered: will hyperscale cloud providers or agile startups emerge as the victors? According to GlobalData, nimble startups hold an advantage with their ability to create highly customizable Gen AI models, posing a potential threat to big tech companies that risk being outmaneuvered by their smaller competitors.

When considering the startup activities of hyperscalers, two key groups stand out as potential contenders: hardware vendors and system integrators (SIs).

Analysts estimate that the Generative AI market will reach a remarkable $200 billion by 2032

While hardware is a critical component of AI, vendors aim to transition to the software side to access the substantial revenue opportunities it presents. Startups can provide vendors with the necessary software expertise and experience, helping guide strategic investments in hardware by aligning them with enterprise expectations and applications.

Additionally, as Generative AI applications and services are deployed, SIs play a vital role in helping vendors package solutions that effectively address enterprise pain points and bring them to market, supporting vendor commercialization. SIs act as intermediaries between application developers (startups) and hyperscalers, making it crucial for them to build a robust ecosystem of AI startup partners.

Another sector set to benefit from the Generative AI revolution is semiconductors, which provide critical inputs for processing complex calculations. AI models demand significant computing power, rendering GPUs more efficient than CPUs. GPUs can enable faster computations compared to CPUs' sequential architecture. This shift from CPU to GPU architecture has far-reaching implications. Thus, investment in the entire AI infrastructure value chain, encompassing semiconductors and other companies associated with products required for advanced computing, is crucial for large-scale AI training and development.

AI Startups Show Strong Growth Potential

In the race to monetize Generative AI, startups hold a distinct advantage over their larger competitors due to their innovation edge. While some startups may be acquired, others may choose to forge their own path, leveraging established partnerships with hyperscale providers.

Hyperscalers recognize the potential of startups as a pathway to Generative AI monetization. They are pursuing strategic initiatives, including incubation, acceleration and venture funding, to support startup development. Companies like Amazon Web Services (AWS) and Salesforce have recently announced initiatives to tap into the commercial value offered by Generative AI startups.

Collaborating with startups will lead to the creation of an AI application marketplace. While hyperscalers can develop apps in-house, partnering with startups to build collaborative applications proves to be more resource-efficient, considering the time, cost and vertical expertise involved.

In parallel to this, for Gen AI startups to transform the current hype into long-term growth, they should consider the following key aspects:

Cater to customer needs: Identifying and addressing customer problems should be the initial focus. Applying Gen AI technology in a way that solves known and understood customer issues will yield the most impactful results.

Plan for global scale: Startups pursuing product-led growth should aim to sell globally. Expanding into more markets leads to more buyers, increased revenue and accelerated growth. Building a financial cushion helps these companies withstand individual shocks and market fluctuations.

Build a monetization strategy: Determine the value metric, then proceed to test and refine it to establish the correct price point. A robust monetization strategy ensures that customer needs remain at the core of the business while sustaining its growth.

Within the application layer, startups can differentiate themselves by building excellent products and leveraging a data moat. The competition in the Generative AI landscape is fierce, with applications ranging from text to videos. Nevertheless, the potential monetization value makes the fight for survival worthwhile.

By navigating these considerations and focusing on product excellence and customer satisfaction, Gen AI startups can position themselves for long-term success in this competitive landscape.

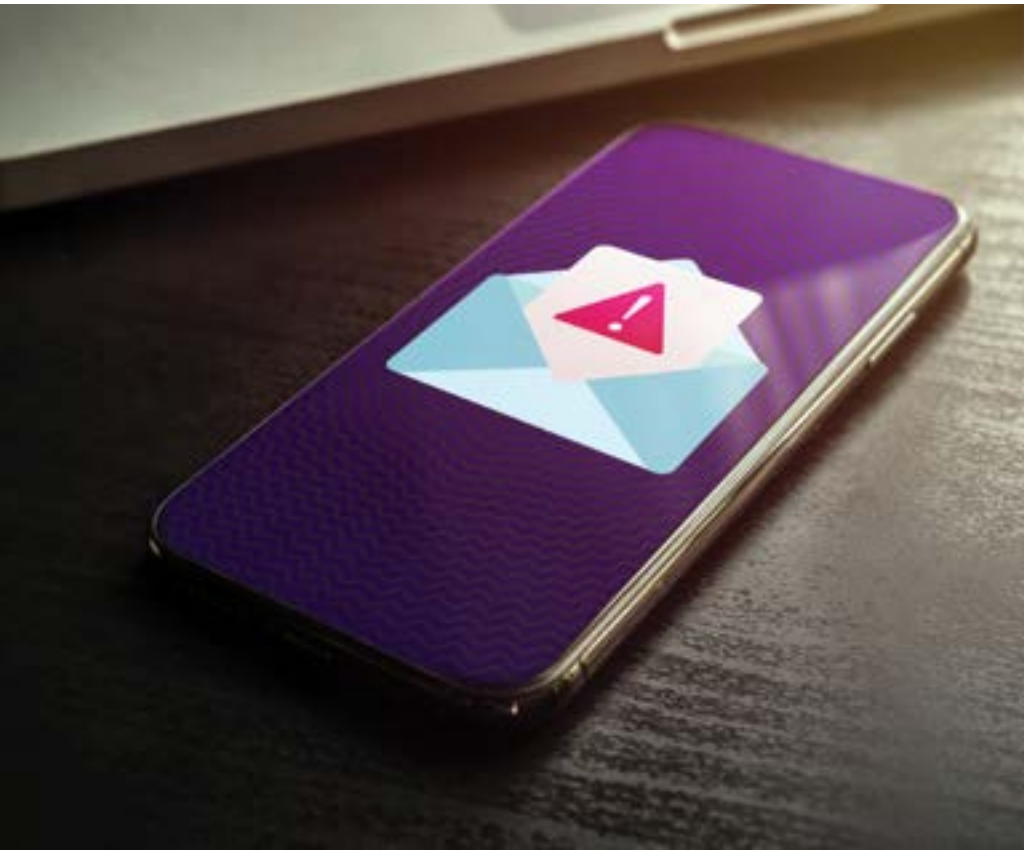
It's Still Early to Declare a Winner

The rise of Generative AI has not only opened up monetization opportunities for the sector but also set the stage for a revolutionary shift in the AI landscape. As the market expands, the economic potential becomes evident, and the profound impact on human-technology interaction takes center stage. The story of Generative AI is one of innovation, competition and the quest for a future where AI becomes an integral part of our lives, driving economic growth and reshaping industries along the way. TR

> The Cloud's role in shaping the future of Generative AI cannot be overstated

Digital Manipulation 2.0: Social Engineering in the Age of Advanced Technology

Social engineering refers to the manipulation and exploitation of human psychology and behavior in order to: deceive individuals; gain unauthorized access to information, systems or physical spaces; and compromise their security.



Just as a con artist uses various tactics to gain someone's trust and then deceive them for personal gain, a social engineer employs similar techniques in the digital realm.

Social engineering remains a prevailing technique employed by attackers to infiltrate systems with malware, and they have recently expanded their tactics beyond search engines. Nowadays, attackers exploit various communication channels, such as collaboration and messaging apps.

In their quest to evade detection, attackers have strategically leveraged HTTP and HTTPS protocols, utilizing ports 80 and 443 as their primary communication channels. This tactic allows attackers to seamlessly blend in with the overwhelming volume of HTTP and HTTPS traffic present on the network, making it more challenging for security systems to flag and block their communications.

Most Common Social Engineering Attacks

According to a study, a staggering 75% of participants perceive phishing attacks as the most significant cybersecurity threat within their respective organizations. These are also among the top malware downloads during Q1 2023.

Phishing stands out as a highly pervasive form of cybercrime, with a staggering count of over 500 million reported phishing attacks in 2022 alone. This surge is unsurprising, given that phishing is widely acknowledged as one of the most accessible and effective scams to exploit individuals.

Phishing manifests in various forms, including email phishing, spear phishing and business email compromise (BEC). These deceptive techniques aim to trick people into divulging sensitive data or unknowingly downloading malware.

Without a doubt, phishing serves as a convenient entry point for cybercriminals, granting them swift access to an organization's systems. Through the deployment of malware, ransomware or other malicious code, attackers can swiftly disrupt an organization's operations and cause significant harm. The consequences of a successful phishing attack can be far-reaching, ranging from financial losses to reputational damage and compromised data security.

Four Distinct Phases

Social engineering attacks typically involve four distinct phases. These phases outline the general progression of an attacker's strategy and provide insights into their methodology. Here are the four phases of a social engineering attack:

- Reconnaissance: In this initial phase, the attacker gathers information about the target or targets. They may conduct research through various means, including online searches, social media profiling or even physically observing the target's surroundings. The objective is to gather as much relevant information as possible to personalize the attack and increase its chances of success.

- Manipulation: Once armed with information, the attacker starts crafting a persuasive and tailored approach to exploit the target's vulnerabilities or biases. This phase often involves psychological manipulation techniques such as establishing trust, leveraging authority or appealing to emotions like fear or curiosity. The attacker aims to manipulate the target into taking a desired action, such as revealing sensitive information or granting unauthorized access.

- Exploitation: In the exploitation phase, the attacker capitalizes on the manipulated trust or vulnerability of the target. They may deploy various tactics, such as sending phishing emails, making phone calls impersonating legitimate individuals or organizations or utilizing malicious software. The specific method employed depends on the attacker's

goals and the information obtained during the reconnaissance phase.

- Result and Exit: The final phase involves the desired outcome of the social engineering attack and the attacker's exit strategy. Once their objective is accomplished, the attacker may cover their tracks, remove evidence or retreat from the compromised environment to avoid detection.

Smarter Cybercriminals

A Cambridge-based cybersecurity firm reveals that AI-powered social engineering attacks have surged as a result of ChatGPT. Attackers are leveraging AI to craft sophisticated phishing emails that are longer, well-punctuated and convincingly written.

However, the impact of generative AI tools extends beyond textual manipulation. Criminals are actively discussing on dark web forums how to exploit ChatGPT for social engineering purposes. They are finding ways to bypass access restrictions and leverage their capabilities to evade detection tools, generating multiple unique messages to circumvent spam filters and creating polymorphic malware that is difficult to detect.

Moreover, attackers can now deliver a one-two punch with a credible email followed by a phone call that spoofs the sender's voice, all with consistent and professional messaging. Organizations should anticipate increasingly sophisticated social engineering attacks leveraging AI, emphasizing the need for robust security measures to protect against these evolving threats.

Mitigate Risks

Given their potential consequences, social engineering attacks pose a significant threat to both individuals and organizations. By exploiting human psychology and emotions, attackers can successfully deceive even the most tech-savvy users.

To mitigate the risk of social engineering attacks, it is essential to adopt preventive measures and remain vigilant. Some recommended steps include:

- Keeping software and systems up-to-date to address known vulnerabilities
- Implementing strong, unique passwords and enabling two-factor authentication for added security
- Regularly educating and training employees on social engineering techniques and red flags
- Encouraging a culture of skepticism and critical thinking; urging individuals to question and verify before sharing sensitive information
- Staying informed about the latest social engineering threats and tactics through reliable sources and industry updates

In order to steer clear of becoming a victim of social engineering scams, you can pause and carefully consider a series of significant questions before taking any action. By incorporating this proactive approach, individuals can fortify their defenses and minimize the risk of falling for deceptive tactics employed by social engineers.

- **Are you expecting a message?** Exercise caution when encountering unexpected or unsolicited messages, and resist the temptation to hastily click on or interact with attachments or website links.
- **Have you verified the sender's email address?** It is common for social engineers to employ display names that mimic official senders, making it crucial to scrutinize email addresses carefully for accuracy. Even a slight variation, such as a single different letter, in the email address can make a significant difference in avoiding a potential scam or becoming a victim of one.
- **Have you verified the embedded links?** To ascertain the true destination of a link, simply hover your mouse over it (without clicking!) to reveal the actual URL. By performing this simple action, you can uncover potential discrepancies and protect yourself from falling victim to social engineering schemes.
- **Is the content of the message logical?** Take a moment to review the message once more and assess its coherence. Consider whether the nature of the request is reasonable. By applying this discerning approach, you can identify inconsistencies and recognize suspicious patterns.
- **Do they usually reach out like this?** To ensure authenticity, it is advisable to verify the legitimacy of the communication by directly contacting the sender through their known phone number or another official channel.

By incorporating these practices, individuals and organizations can actively contribute to their own safety and security in the constantly evolving landscape of cybersecurity. TR

Social engineering remains a prevailing technique employed by attackers to infiltrate systems with malware

Nokia Shares Financial Report for Q2 and First Half of 2023

Despite macroeconomic uncertainties, Nokia Corporation delivered a resilient performance during Q2. Net sales remained flat year-on-year in constant currency, with a slight decline of 3% on a reported basis. Notably, Enterprise net sales saw substantial growth, rising 27% year-on-year in constant currency (25% reported).

However, the comparable gross margin experienced a 180 bps decline year-on-year, reaching 38.8% (the reported margin declined 200 bps to 38.2%). This drop is primarily attributable to the regional mix in Mobile Networks. Nevertheless, the strong margin in Network Infrastructure and catch-up net sales in Nokia Technologies partially offset this decline.

Furthermore, the comparable operating margin also faced a decrease of 120 bps year-on-year, settling at 11.0% (the reported margin declined 130 bps to 8.3%). This decline was driven by the aforementioned gross margin factors, but it was partly mitigated by reduced operating expenses and higher operating income.

The comparable diluted EPS (Earnings Per Share) stood at EUR 0.07, while the reported diluted EPS was EUR 0.05. Nokia reported a negative free cash flow of EUR 0.4 billion, resulting in a net cash balance of EUR 3.7 billion.

In light of these results, Nokia adjusted its full-year 2023 outlook. The company now expects net sales for the year to fall in the range of EUR 23.2 billion to EUR 24.6 billion, with a comparable operating margin anticipated to be in the range of 11.5% to 13.0%, as announced on July 14, 2023.

Regarding this news, Pekka Lundmark, president and CEO of Nokia, stated: "In Q2, we delivered stable net sales in constant currency compared to the prior year. As a result of prudent management of our costs, we were able to deliver a solid comparable operating margin of 11.0%, despite the regional mix headwinds faced in our Mobile Networks business. Considering the significant decline in major North American operators' investments, our operating margin has proved resilient, even adjusting for the EUR 80 million of catch-up net sales in Nokia Technologies." Lundmark credited 5G deployments in India for offsetting weakness in North America.

The Future of Networks: Cisco's 2023 Global Networking Trends Report

Cisco published its 2023 Global Networking Trends Report, which examines how IT organizations are evolving their network technology, talent and operations to drive digital transformation and multi-cloud initiatives.

The report is based on a survey of more than 2,500 IT decision-makers from 13 countries around the globe. It uncovers several key trends and priorities across business and technology that will impact the future of networking and the role of networks in a successful cloud strategy.

Commenting on the findings of the report, Osama Al-Zoubi, CTO, Cisco Middle East and Africa, said: "Today, the network is both the tool for digital transformation and the main means of keeping the lights on across several industries in the Middle East. To align with the region's evolving needs and shifting IT priorities — security, agility and business performance have overtaken cost and network management as the key concerns for IT teams. Solutions that offer end-to-end visibility and automation are the ones most in demand. While the trends identified in the report are important in themselves, the real value is in how they can inform decisions moving forward."

The study highlighted the following findings:
Hybrid work continues to increase the challenges of securing connectivity. The era of hybrid work is driving the need for new approaches to securely connect remote workers to corporate data and assets distributed across multi-cloud environments.

While employees are encouraged to return to the office, more than 40% continue to work remotely, either full-time or a few days a week.

Traditional security models become obsolete, creating a headache for IT professionals, with more than half (51%) identifying cloud security risks and 39% citing the increase in remote workers as major challenges.
The transition to cloud and multi-cloud is accelerating. If business agility is the question, many continue to see the cloud as the answer.

Organizations continue to adopt cloud platforms, with 78% of survey respondents saying that their organizations are planning to host more than 40% of their workloads in the cloud by 2025, up from 63% of organizations today.

Multi-cloud adoption is also on the rise, with 42% of cloud and networking professionals saying that more agile and scalable application development is a key motivation for using multiple clouds.

China Mobile and ZTE Successfully Validate Technologies for Wireless Network Digital Twin

ZTE Corporation, a global leader in information and communication technology solutions, and China Mobile have jointly completed the research and laboratory verification of key technologies for their wireless network digital twin. This milestone includes multi-service twinning, wireless channel twinning and intelligent optimization decision-making based on ZTE's high-fidelity wireless network digital twin platform.

This successful verification lays the technological foundation for the joint cooperation of China Mobile's new generation AI open platform and ZTE's digital twin platform, leading the development of wireless network intelligence and promoting technology innovation to empower the digital transformation of operators.

The multi-service twinning technology utilizes temporal Generative Adversarial Networks (GAN) to replicate real video services such as iQiyi, Youku and Tencent within the digital twin environment. Notably, the packet mean error of the digital twin application remains within 10% when compared to real applications. This precision allows for evaluating the impact of real applications on user behaviors, network scheduling capabilities and network performance indicators with exceptional accuracy. This groundbreaking technology empowers operators to make informed decisions and effectively optimize their wireless networks.

The wireless channel twinning technology performs high-fidelity twinning of wireless channels in physical networks. By extracting specific channel characteristics, it further improves twinning precision. The RSRP error of the twinned wireless channel is controlled within 2 dB, and the errors of other major air interface indicators such as throughput are within 15%. Meanwhile, intelligent prediction technology is used for outdoor wireless channels, and the standard deviation between the predicted RSRP value and the measured RSRP value is within a range below 3 dB.

Intelligent optimization decisions are a critical approach to enhancing network intelligence. It offers researchers an approximation of a real wireless network twinning environment, where AI algorithms can be designed to make intelligent optimization decisions and improve network performance. Utilizing the digital twin platform, the output of intelligent optimization decisions results in an increase of more than 5% in downlink throughput and more than 25% in uplink throughput compared with manual optimization.

Network Resilience Coalition Launched to Tackle Threats to Outdated Infrastructure

Today, industry leaders from networking, service providers and cybersecurity announced the launch of the Network Resilience Coalition, an alliance focused on bringing together technology providers, security experts and network operators seeking to propose real-world solutions that dramatically improve the security of data and networks that support our global economic and national security.

Software and hardware vendors spend tremendous amounts of time and effort to ensure that all products and services are as strong and secure as possible. Unfortunately, it is common for organizations to lack robust patching and vulnerability management programs or to not install critical updates in a timely manner, despite their availability.

Not only does failing to upgrade or update hardware and software systems put the individual organization at risk, but it can also lead to cyberattacks on a global scale targeting aging network infrastructure. This was evidenced by recent advisories from the UK's National Cyber Security Centre and the U.S.'s Cybersecurity and Infrastructure Security Agency, as well as reports of state-sponsored activity.

Technology companies must find ways to address the continued problem of software and hardware updates and patches not being implemented while also encouraging organizations to have better visibility into their networks to better mitigate cyber risks. The Network Resilience Coalition was formed to help address these issues in an open and collaborative way and to help improve network hardware and software resilience on a global scale. By bringing together infrastructure vendors and major network operators who are experienced in deploying patches in a timely manner, the coalition aims to address network hardware and software resilience challenges and inform good policy.

Founding members of the new coalition consist of leaders who have been addressing this problem at its roots, including AT&T Inc., Broadcom, BT Group, Cisco Systems Inc., Fortinet, Intel Corp., Juniper Networks, Lumen Technologies Inc., Palo Alto Networks, Verizon and VMware.

Telecom Egypt Provides First Subsea Connectivity to St. Helena Island

Telecom Egypt, the country's first integrated telecom operator and one of the largest subsea cable operators in the region, and the St. Helena Government (SHG) have announced that the connectivity of the Island via the Equiano subsea cable system is now live. St. Helena is now connected to the rest of the world for the first time, marking a crucial step towards the Island's economic growth.

SHG is currently working to ensure that the Island can fully leverage the full potential of the cable and start using the new connectivity path as soon as possible. This includes the construction of a new Island-wide domestic network to plug into the Equiano landing station terminal, which will enable it to deliver fiber-based high speed and a full package of benefits to both homes and businesses.

The branch connecting St. Helena to the rest of Telecom Egypt's system on Equiano is 1,140km long. The cable runs from the West Coast of Africa and provides St. Helena with access to both Portugal and South Africa with scalable connectivity. The initial configuration is based on 400G lambda using the Nokia 1830 PSE-Vs (7nm) chipset and is ready to be upgraded in the future with the latest PSE-6S (5nm) chipset towards multi-terabit connectivity. It, therefore, provides the most cost-efficient solution that caters to the growth in the Island's bandwidth needs.

Considering its vast experience in the subsea connectivity business, Telecom Egypt, in conjunction with SHG, provides a Dynamic Circuit Network functionality, which will ensure that SHG's communication partners have access to fixed bandwidth. Telecom Egypt has also supported SHG in the design, installation and configuration of the subsea and network equipment.

St. Helena's Minister for Treasury, Infrastructure and Sustainable Development, Mark Brooks, said, "We are thrilled to witness this historic moment. This will offer opportunities for significantly faster internet connectivity speeds and bandwidth for the first time, assuring a better quality of life for people and businesses in St. Helena."

Meanwhile, Mohamed Nasr, managing director and chief executive officer at Telecom Egypt, said, "Equiano marks Telecom Egypt's first endeavor in West Africa, with St. Helena being a step forward in the company's plans to expand its services beyond the MENA region and into new territories, thereby fortifying its international presence by providing subsea solutions to global partners."

Pierre Chaume, vice president of North and West Africa at Nokia, added, "Our scalable technology will futureproof the network, as and when the demand increases, to further drive the economic growth of the Island."

OQ Technology and Aramco Strengthen Ties With New Technology Connectivity MoU

OQ Technology has announced the signing of a new MoU with Aramco that aims to further strengthen their existing collaboration and focus on automation and Satellite IoT connectivity for Aramco's remote site infrastructures.

Intelligent Integrated Node (IIN) technology is an innovative automation infrastructure technology invented by Aramco and developed by MOXA Inc. It combines instrumentation control, monitoring, and edge computing capabilities into a single fault-tolerant device. The technology unifies various devices from multiple vendors and has received numerous awards, including the 2018 Custodian of the Two Holy Mosques Prize for Inventors and the 2020 International Society of Automation (ISA) Excellence-In-Innovation Award.

The significance of this collaboration lies in the synergy between Aramco's automation edge technology and OQ's Low Earth Orbit (LEO) 5G NB-IoT infrastructure, which offers significant potential. It will accelerate the development of IoT applications, personal products, safety, security & surveillance, fire protection, automotive, healthcare, intelligent defense, and other industries in Saudi Arabia and globally.

The parties intend to work together to create an integrated package that includes the Aramco automation edge technology being developed by MOXA with OQ Technology infrastructure and to promote the solution opportunities in the network manufacturing value chain that are related to the oil and gas industry.

Omar Qaise, founder and chief executive officer at OQ, said, "Integrating 5G IoT and IIN technologies will increase operational efficiencies downstream, reduce raw material consumption, and minimize personnel travel to remote sites, contributing to a more efficient green economy — a key component of Saudi Arabia's 2030 vision. The MoU further advances the technological cooperation between Aramco and OQ."

Caution Ahead:

Exploring the Benefits and Dangers of AI Voice Cloning

Have you ever received a call from a kidnapper demanding money to bring your daughter back to you while hearing her scream in the background? Or maybe someone impersonates a close friend and asks you to meet in an unfamiliar location? As implausible as these scenarios sound, with artificial intelligence, nothing is impossible, even accurate, if potentially troubling, voice cloning.

Voice cloning involves the creation of synthetic voices that mimic a target voice through speech synthesis. By cloning a voice, it becomes possible to replicate it accurately, enabling its use in voice assistants or real-time voice changer applications. The process typically requires a substantial amount of recorded speech to generate a collection of datasets that can then be utilized to create a new voice model. Simply put,, by following just a few simple steps, voice clones are now a reality.

An Adverse Effect on Privacy?

Despite being an impressive technology, AI voice cloning may violate people's privacy rights, especially when it comes to safeguarding personal information. Malicious actors can exploit voice recordings gathered for legitimate purposes to engage in prohibited actions like impersonation, fraud or even blackmail.

The ease with which one's voice can now be copied and altered is one of

the biggest concerns about AI voice cloning. Such access can give rise to several fraudulent practices, including voice phishing, social engineering and the spread of false information. Identity theft and voice-based scams pose a serious threat in a nation as diverse and densely populated as India, where the languages and cultural landscapes can differ greatly.

Additionally, it is impossible to disregard the ethical implications and ramifications of AI voice cloning. Using someone's voice without their consent violates their rights and raises ethical questions about ownership and consent.

Voice cloning is fast becoming a sought-after method used in AI scam calls. Scammers utilize audio snippets of people's voices that are available online and easily upload them to specialized web tools that can imitate those voices. While such apps have been around for some time, recent advancements in generative AI technology have made them more accessible and affordable.

Impact Across Industries

AI cloning has the potential to have a far-reaching impact across many industries, particularly those that place a high value on authenticity, trust and interpersonal relationships. The following examples may be especially susceptible to the harmful consequences of AI cloning:

- **Financial sector:** AI voice cloning poses a serious threat to the financial sector. The techniques used in coice cloning can undermine voice-based authentication systems traditionally used for secure access and banking transactions. This can erode the trust and security of financial institutions by allowing identity theft and, thus, unauthorized access to accounts and subsequent fraudulent activity.
- **Customer service and call centers:** The customer service sector mainly relies on voice interactions to provide individualized assistance and support. AI voice cloning can allow criminals to replicate customer service agents' voices, enabling social engineering attacks, phishing schemes and other fraudulent operations that prey on unwary customers.
- **Journalism and the media:** AI cloning introduces vulnerabilities to the media sector, potentially leading to disinformation and manipulation. Voice cloning may be used to propagate misleading information, create fake news and sway public opinion. The validity of voice recordings may be difficult for journalists to confirm, threatening their credibility and eroding public trust.
- **Law enforcement and security:** AI cloning can impede the work of law enforcement and security agencies. Cloned voices can deceive listeners and alter audio evidence, hindering investigations and jeopardizing the fairness of courtroom proceedings. Criminals can pose as government officials using voice cloning, potentially leading to confusion, mistrust and compromised security.
- **Political leaders and public figures:** AI cloning poses a serious threat to public figures, celebrities and political leaders. Cloned voices can be exploited to generate false declarations, speeches or endorsements, tarnishing reputations and disseminating misleading information. The impact on political processes and public trust could be significant.

Regulation Is a Must

Given the potential dangers and adverse effects that could result from AI voice cloning, it is becoming increasingly essential to establish comprehensive rules and regulations. These should encompass all of the privacy, legal and ethical issues raised by voice cloning technology.

One essential aspect is the strengthening of current data protection regulations so that they cover voice recordings as sensitive personal information. Strict controls should be in place to guarantee that permission is obtained and that voice data is safely stored for a limited duration.

AI voice cloning, which includes producing synthetic sounds that mimic real voices — actual people — has received a lot of recent attention and notoriety. Though this technology has its advantages, it also raises numerous questions and potential risks.

To proactively address these issues, it is preferable to face them as early as possible. By tackling the challenges associated with AI voice cloning promptly, we can mitigate its potential negative consequences and develop safeguards for the future. TR

Voice cloning is fast becoming a sought-after method used in AI scam calls

Nokia Begins Deployment of 5G Monetization and Service Delivery System

Nokia has recently announced the initiation of the deployment of its Converged Charging (NCC) software for Vodafone in multiple European countries. This deployment utilizes a cloud-based agile delivery model, enabling efficient rating and charging for 5G services while enhancing the delivery of products and services to customers.

NCC functions as a containerized network feature in a 5G standalone environment, granting Vodafone access to new revenue streams from 5G services, such as network slicing and flexible product offerings. The deployment encompasses various Vodafone markets across Europe, including the UK and Italy, and facilitates standardized next-generation charging across Vodafone networks with real-time rating and charging capabilities. This marks a complete transition from legacy charging systems to 5G-ready methods.

NCC empowers communication service providers to swiftly and effectively create and launch new services to the market, utilizing intuitive drag-and-drop functionality. Its highly configurable nature empowers Vodafone to tailor the solution to cater to consumers, enterprises, and new business models.

Alberto Ripepi, chief network officer of Vodafone, said, "5G enables many new services and, with this new system, new ways to charge for them. By leveraging the scale of our pan-European and African networks, we can help customers manage factory equipment, open developer marketplaces using our APIs and enable enterprises to offer bespoke products to their own customers."

Hamdy Farid, senior vice president of business applications at Nokia, said, "We are pleased to be furthering our relationship with Vodafone through the roll-out of Nokia's Converged Charging solution.

AWS Cloud Services Selected by Noted Global Energy Company

Amazon Web Services (AWS) has announced that Occidental, an international energy company and carbon management leader, has selected AWS as its preferred cloud provider to drive its digital transformation. As part of this new multiyear agreement, Occidental will migrate its core production applications and on-premises information technology (IT) infrastructure to AWS to improve operational efficiencies, eliminate upfront capital expenditures and support the company's development of systems that will remove carbon dioxide (CO_2) from the atmosphere, including large-scale direct air capture (DAC) plants.

Occidental will move its production systems, applications, analytics tools and workflows to AWS to gain a more flexible, scalable and secure IT infrastructure. This mass migration will enable the energy provider to use a broad portfolio of cloud services, including Amazon Elastic Compute Cloud (Amazon EC2) for secure and resizable compute capacity and Amazon Elastic Block Store (Amazon EBS) for high-performance block storage, to scale IT resources to meet supply and demand fluctuations in the energy market. Leveraging AWS analytics and machine learning will help Occidental gain greater insights and automate processes. For example, Occidental will use AWS Lake Formation to help manage its data lakes and break down data silos, bringing new life to historical data. This will allow Occidental to increase efficiencies and extract greater value from operational data, such as by improving exploration decision-making times or optimizing equipment performance.

Generative AI Announcements Reshaping Global IT Economies and AI Ecosystems

GlobalData, the industry-leading data analytics and consulting service, highlighted the potential impact of recent key generative AI (GenAI) announcements, posing a significant threat to cloud platform competitors and reshaping the AI industry's ecosystem. Furthermore, the company has launched its inaugural quarterly Generative AI Watch Newsletter, aimed at keeping enterprises informed about the latest developments in GenAI and how these emerging technologies, along with security, ethics and regulatory considerations, may affect their businesses and roles in the global IT economies.

"Cloud and application platform providers remain at the forefront of prominent GenAI announcements, determined to remain competitive by integrating GenAI capabilities into their core technology solutions and dominating in the ongoing cloud wars," stated Charlotte Dunlap, the research director at GobalData. "Vendors ranging from established platform providers to AI startups continue to emphasize their ability to provide ethical, responsible and trustworthy GenAI solutions.

For example, Salesforce announced in recent weeks that its AI Cloud's Einstein GPT Trust Layer is aimed at assuring customers of its enterprise-grade data security and data privacy strengths. Startup Anthropic recently espoused responsible AI usage through a training technique called Constitutional AI."

Sparkle Launches Next Gen Carrier-Neutral Green Data Center

Sparkle, the first international service provider in Italy and among the top global operators, in joint venture with Trans Ocean Network (TON), a Panamanian telecommunications company, launched Panama Digital Gateway (PDG), a green open landing and connectivity data center set to become the digital hub for all Central America, the Andean region, and the Caribbean.

Panama Digital Gateway is a next generation carrier-neutral hub, the first green data center in the country, featuring state-of-the-art technologies and infrastructures to satisfy all customers' requirements. Located in Corazal (Panama City), the new building offers 5,500 square meters of space for up to 650 equivalent racks and 3.5 MW of scalable power. It is built following the most stringent anti-seismic criteria and designed to guarantee the maximum standards of reliability and performance while minimizing its impact on the environment.

Integrated with Sparkle's global backbone - more than 600,000 km of fiber spanning from Europe to Africa, the Americas and Asia – Panama Digital Gateway is the landing point of Curie, the cable system connecting California to Chile with a branching unit into Panama developed by Google and Sparkle, and of new upcoming submarine cables looking for a diversified entry way to Central America, thus strengthening the role of Panama as the strategic digital hub between North and South America.

Major Global Telcos Forge Alliance for AI

SK Telecom, Deutsche Telekom, e& and Singtel have announced that they have formed the Global Telco AI Alliance to create a new customer experience for global citizens using AI technology.

The four members of the Global Telco AI Alliance aim to jointly accelerate the AI transformation of the existing telco business and develop new growth drivers through new AI-powered business models. Together, they signed a Multilateral Memorandum of Understanding (MOU) for cooperation in the AI business in Seoul. Key executives of the four telcos who attended online or in person included Claudia Nemat, Board Member, Technology and Innovation at Deutsche Telekom; Hatem Dowidar, Group CEO of e&; Yuen Kuan Moon, Group CEO of Singtel; Chey Tae-won, Chairman of SK Group; and Ryu Young-sang, CEO of SKT.

The Telco AI Platform is expected to serve as the core foundation for new AI services, including those designed to improve existing telco services, digital assistants and super apps that offer a wide range of services.To facilitate the cooperation, they will form the Global Telco AI Alliance Joint Working Group.

"In order to make the most of the possibilities of generative AI for our customers and our industry, we want to develop industry-specific applications in the Global Telco AI Alliance. I am particularly pleased that this alliance also stands for bridging the gap between Europe and Asia and that we are jointly pursuing an open-vendor approach. Depending on the application, we can use the best technology. The founding of this alliance is an important milestone for our industry," noted Claudia Nemat of Deutsche Telekom.

Verizon's New Internet Solution Is a Blessing for Multi Dwelling Units

Verizon has completed a proof of concept in Texas, showcasing a new multi-unit internet solution which could expand the addressable homes and businesses that can be served with its vast mmWave spectrum holdings.

Specifically designed for multi dwelling units (MDUs) (such as apartment buildings and townhomes) and distributed enterprise campuses and high rises, this point to multipoint architecture leverages Verizon's mmWave high band spectrum holdings, owned fiber infrastructure and existing Intelligent Edge metro and core infrastructure to provide reliable, secure, multipoint connections from a single donor cell site.

The recent demonstration showcased an architectural design that is less expensive to build, quicker to deploy, and addresses the unique complexities of distributed end users in a single facility or small area such as a residential unit with a large population.

In this proof of concept, an airlink over licensed mmWave spectrum was established between a centralized, rooftop radio site and a radio atop a simulated multi end-point building. The signal was then transmitted via coaxial cable throughout the building to a data processing unit along with a corresponding modem. From there, the building's existing wiring transported the signal to end user routers that provided broadband coverage throughout simulated distributed end points. Instead of transmitting the data through Verizon's 4G and 5G wireless cores, this architecture uses a simplified Broadband Network Gateway to direct the traffic to and from the internet over Verizon's public IP network. This means that data traffic will not add load on Verizon's current wireless cores while at the same time providing excellent capacity and latency.

Collaboration With Carriers Crucial for Nothing Smartphones in US Markets

The smart phone startup Nothing, headed by CEO and founder Carl Pei, has to do more than just upgrade its products to survive the US market, according to GlobalData experts. The UK-based Nothing Technology has recently launched its Phone (2) in the US.

"The number one priority for Nothing in the immediate future should be to offer support for Verizon's network on its Phone (2) and strike carrier partnerships with all three major US carriers. Without doing these two things, Nothing stands little to no chance of making any material difference in the US mobile market," says Ardit Ballhysa, Technology Analyst at GlobalData, a leading data and analytics company, offers his view:

He further goes on to say, "After establishing carrier partnerships, the company needs to develop an ecosystem of devices and services to push it further into the mainstream, where it can start to take higher levels of market share from rivals. However, given the company's relatively fledgling status, it might take a few years before an ecosystem can start to take shape. It was at least positive to hear a mention of a long roadmap planned for Nothing, which consists of other devices to bolster the company's ecosystem play."

Ballhysa opines that company's founder and CEO Carl Pei has done a tremendous job in garnering customer interest towards Nothing phones through his dynamic presentation and interviews with content creators, creating a "sense of community, familiarity, and ultimately loyalty to him and the company."

The Nothing Phone (2) offers several improvements over the Phone (1). Such improvements include Qualcomm's 8+ Gen 1 Snapdragon's 2022 flagship mobile processor, better camera modules, faster charging, and a bigger and better display. With all these changes, the Phone (2) is positioned as a strong mid-tier offering that is better suited to take on Apple's iPhone SE, Samsung's Galaxy FE series, and Google's Pixel A series, rather than their respective premium smartphones.

"The Glyph interface also received some updates over the previous phone to make it more customizable and personable to a user owing to an increase in the number of LED lights. In particular, users can dedicate one of the LED strips to act as a countdown timer, progress bar for volume, select delivery services, and manually create their own light pattern for notifications."

Global Telcos in Q1 2023: ARPU Trends

In this exclusive three-part series, Telecom Review will share valuable insights on the benchmarking of leading telecom carriers' enterprise business operations.

In this part, we will review the telcos ARPU performance from the data gathered from Twimbit's analysis titled "Benchmarking the performance of Top 19 Global Telcos in Q1 2023."

Indian telcos Bharti Airtel and Reliance Jio showcased impressive ARPU growth momentum in Q1 2023, with YoY increases of 8.4% and 27%, respectively. Notably, Indian telcos have set ambitious targets to further raise their ARPU to INR 250 (US$3.1) by 2025.

AT&T experienced a 2.0% YoY increase in ARPU, reaching US$55.1. This growth can be attributed to improved international roaming services and a strategic shift towards higher-priced unlimited plans.

Japanese telcos, operating in a mature and saturated market, witnessed a decline in ARPU as they reached peak penetration. This shift in ARPU trends is a natural progression in a saturated environment. However, these telcos anticipate stabilization in the upcoming quarters.

Global Telcos in Q1 2023: Revenue Performance

Telecom Review reports the telcos revenue performance from the data gathered from Twimbit's analysis titled "Benchmarking the performance of Top 19 Global Telcos in Q1 2023"

Bharti Airtel and Reliance Jio, prominent Indian telecom companies, demonstrated commendable YoY growth rates of 14% and 12%, respectively.

The primary driver behind the moderate growth is attributed to constrained growth in ARPU. Notably, Reliance Jio in the prepaid category last made a substantial price adjustment of 25% in November and December 2021. Similarly, Bharti Airtel witnessed tariff increases of 20% in December 2021 and 15% in October 2022.

China Mobile and China Telecom continued to build on their earlier momentum, achieving 10% and 9% growth rates, respectively.

Both prominent Japanese telcos, Softbank and NTT Docomo, achieved significant YoY growth rates of 11% and 8%, respectively.

The revenue growth for NTT Docomo was driven by its expansion into various sectors, such as Real Estate and Energy, in addition to its SI services.

Similarly, Softbank's revenue growth was primarily due to an increased adoption of IoT devices and the implementation of higher royalty rates in the smartphone market.

Telefonica reported growth across all business lines, with a YoY revenue increase of 7%.

Building an Effective ICT Workforce: The Challenges and Opportunities

From our humble beginnings as hunters and gatherers to our present age of rapid digitalization, humans have long been the inexhaustible catalysts of their own evolution.

And the story continues to open up newer chapters whereby human agency plays the leading role, no matter what unfolds or what challenges may come. Indeed, the ongoing digital transformation has brought both benefits and anxieties to modern society. On the one hand, innovations such as digital health and digital payments have revolutionized the model of instantaneous service delivery, while on the other, the menace of cyber-attacks, online fraud and misinformation has become the stumbling blocks of this progression.

Technological advancements in 5G, cloud computing and artificial intelligence are transforming businesses like never before, accelerating productivity, saving costs and enhancing customer experiences. At the same time, the evolution of IoT and edge computing means the mobile ecosystem and networks are becoming ever more complex. We are at a point where our networks simply must deliver value beyond mere connectivity. However, the pace of new technologies entering the market is exceeding the workforce and the expertise that can manage them.

The ICT Skills Gap

ICT skills are the biggest challenge facing the tech sector, according to 61% of global IT decision-makers in a recent survey. The main gaps in tech skills were found to be in the specialties of IT technicians (27%), cloud computing (26%) and AI/machine learning (26%).

Two-thirds of the global population, or 5.3 billion people, are online today, and the remaining 2.7 billion are still

unconnected. To unlock the benefits of the technological surge, the development of digital skills in all economic spheres is indispensable, both in terms of boosting connectivity and connecting the unconnected. Thus, training and capacity building must be top priorities to ensure that citizens as well as ICT professionals possess the right skills and qualifications to make effective use of today's digital tools.

To that end, ITU's Telecommunication Development Bureau has taken up the mandate to fulfill the digital skills gap through the newly launched ITU Academy Training Centres (ATC) program as an extension of the former ITU Centres of Excellence (CoEs) program.

Selected partner organizations provide advanced, high-quality telecommunications/ICT training and strengthen institutional capacity in countries and regions around the globe. The ATC program is aimed at expanding the students' knowledge, developing skills, and harnessing the benefits of digital technologies. The ITU Academy offers over 150 training courses to thousands of ICT professionals every year, nearly 70% of whom are from developing countries.

Promoting digital skills development and digital training programs is key to ensuring inclusive and secure telecommunications/ICTs for sustainable development — one of the core priorities for the ITU Development Sector.

Similarly, in the UAE, telecom operators du and e& both collaborate with vendors Huawei, Nokia and Ericsson, among others, to push ICT development further.

du recently announced a new collaboration with Nokia to strengthen employee skill sets and accelerate talent development initiatives in the UAE. As part of the partnership, Nokia conducts training and development programs for du workers that focus on technology competency and knowledge transfer to help them effectively respond to the increasingly complex challenges facing the digital, technology and telecommunications industries. e&, formerly Etisalat, has been collaborating with Huawei Academy since 2010 as an ICT training hub for the Gulf and Middle East region. Huawei runs the annual Seeds for the Future program, where global participants develop innovations and compete for prizes in technological projects. Huawei also holds the Tech4Good global competition, which encourages young talents to explore digital technologies to address social issues.

Opportunities:

ICT specialists have become among the most sought-after professionals in the labor force. Moreover, the ICT skillset is increasingly in demand in various sectors other than ICT alone, making it a highly mobile workforce. For instance, the MENA market represents a growing gaming consumer base and a fast-developing industry whereby ICT interoperability is of supreme importance. Furthermore, in comparison, ICT specialists' educational attainment and wages are higher than average national standards. As the ICT services subsector grows, the demand for skilled workers will increase. And importantly, the ICT sector is an important contributor to the national economy in most any country, and a well-equipped workforce is the prerequisite for exploring the opportunities in the growing ICT field.

Challenges:

Emerging technologies and the new occupations related to them could significantly change skill requirements, according to industry studies. This will require investment in effective lifelong learning systems and continuous training in the field of ICT for many organizations.

As a result of ICT skills shortages, big companies with deep pockets can hire highly skilled employees offering high salaries, but this trend creates an imbalance in the talent pool, with the danger of such companies absorbing all the talent.

Despite increased participation from women in recent years, ICT remains a male-dominated field. In almost every country, regardless of income level or development stage, women are underrepresented in ICT, based on data available for 116 countries.

Scaling up investments in ICT education and training is of utmost importance; however, managing the return on investment (ROI) for such projects can become complex and tedious for organizations.

Some Considerations

To address the issue of ICT workforce development, experts suggest a holistic approach that combines technical, governmental and soft-skills enhancement initiatives, including:

- Investing in a skill forecasting anticipation system to better understand current and future needs
- Increasing investment in post-secondary education institutions and teaching staff
- Encouraging more women to study STEM subjects and increase their participation in ICT occupations
- Addressing skills gaps between skills acquired at universities or vocational institutions and skills demanded by industry
- Focusing on training and education on soft skills and promoting interdisciplinary approaches to skills development
- Facilitating better recognition of foreign formal qualifications and work experience as well as visa processing
- Regulatory frameworks to govern hiring trends and application processes

The latest market research projects the global digital transformation market size to reach $6.78 trillion in 2029, at a CAGR of 20.9% during the forecast period of 2022-2029. Moreover, the investment in digital transformation in the Middle East, Turkey and Africa is set to top $74 billion in the 2021–2026 period, with an annual growth rate of 16%, according to global consulting firm IDC.

The ICT ecosystem must focus on addressing current and emerging workforce needs by delivering industry-driven activities, including training and reskilling workers, helping employers attract and retain talent, and promoting DEI (diversity, equity and inclusion) in the workforce. TR

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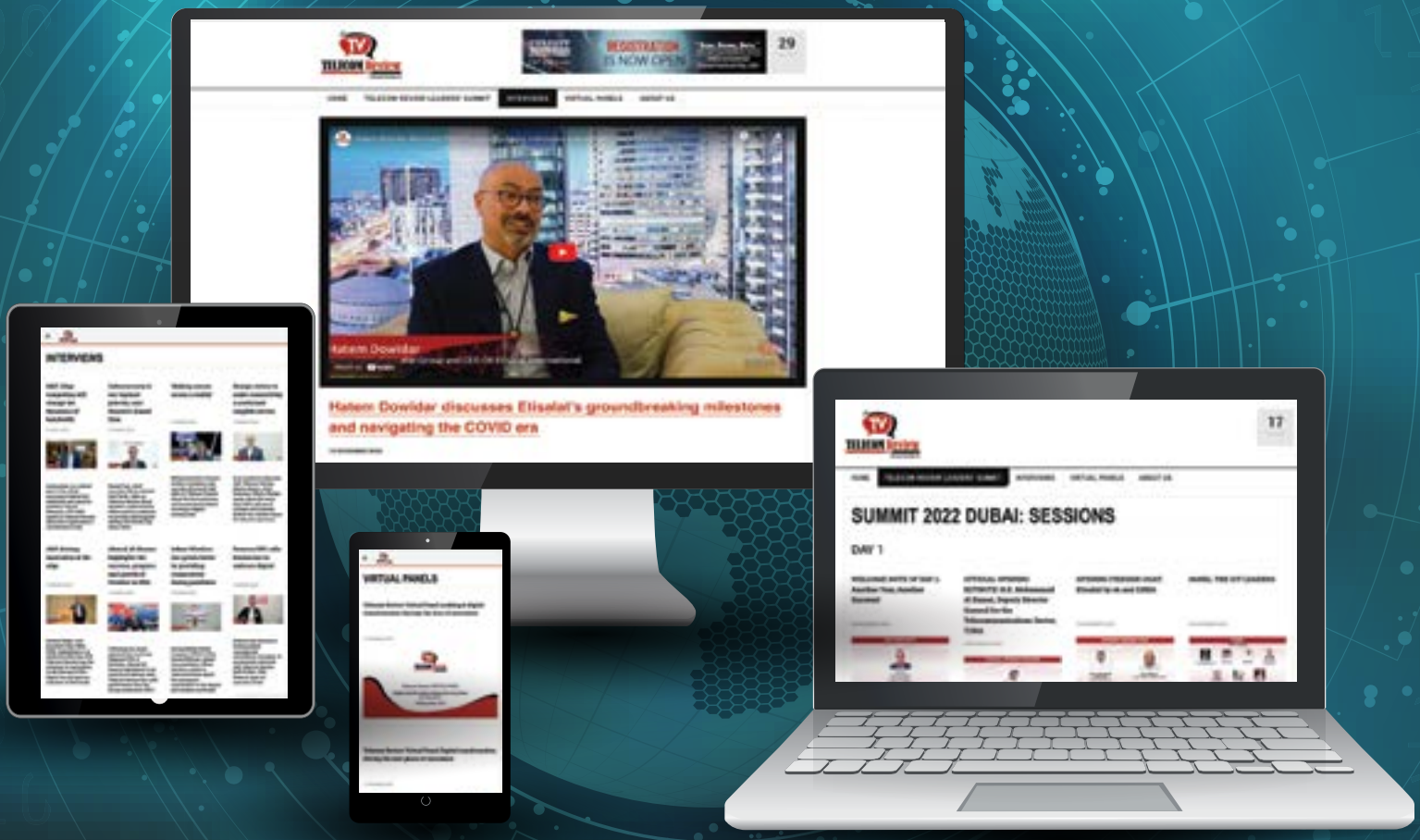

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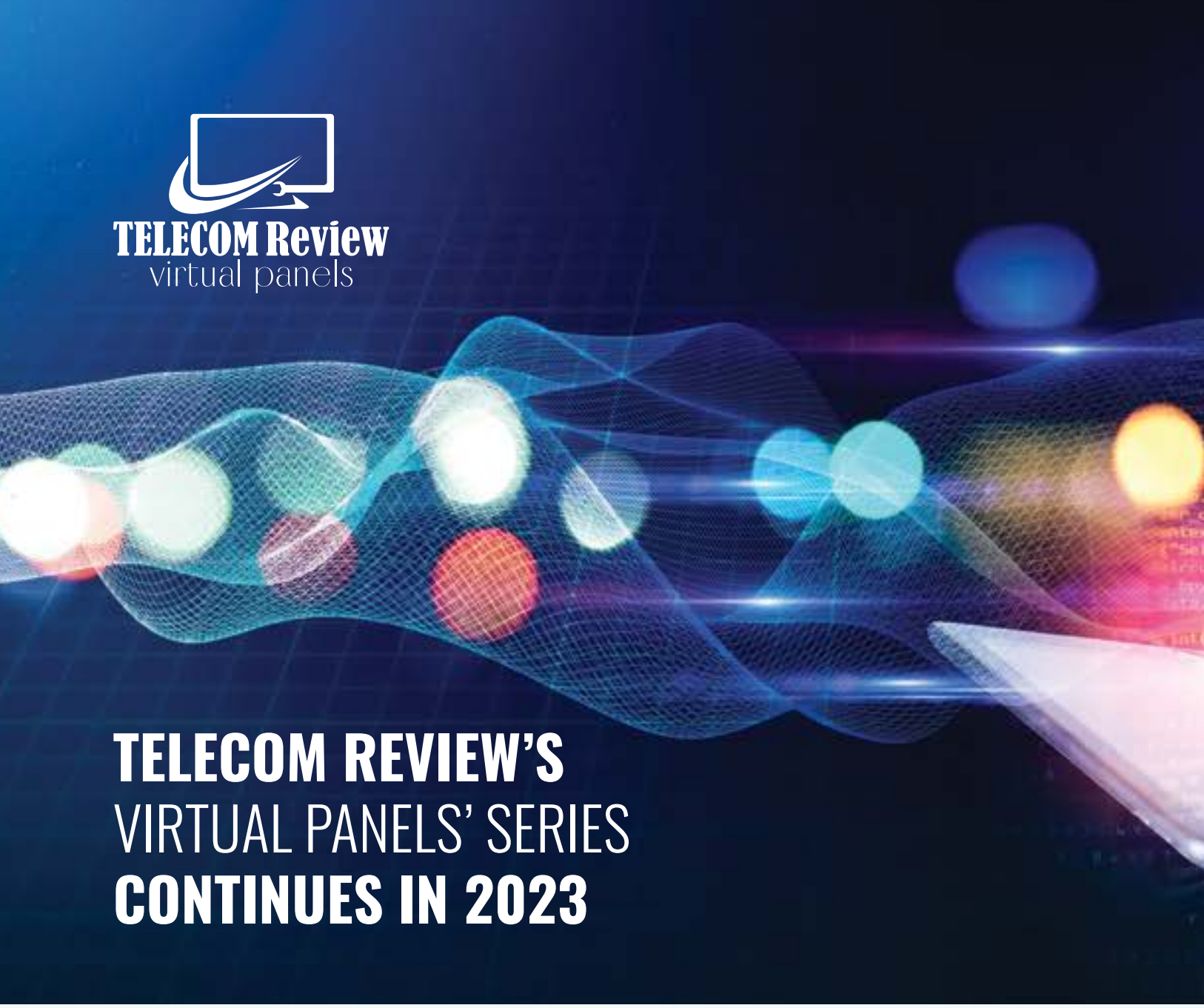

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