SUMMIT
TELECOM Review
LEADERS' SUMMIT
16ᵗʰ Edition

" GLOBAL, REGIONAL, DIGITAL "
07-08 DECEMBER 2022
Intercontinental Dubai
Festival City, UAE

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Toni Eid,
founder
editor in chief
Telecom Review International

Larger Edition, More Exposure, New Opportunities

" Global, Regional, Digital" is the theme of the 16th Telecom Review Leaders' Summit, and it is indeed all of these and more. This edition of our global summit will be the largest ever, with high-level international and regional participation gathered in a digital atmosphere.

On December 7 and 8, industry experts will share their insights and expertise at the Intercontinental Hotel, Festival City, Dubai, UAE. Over the course of the two days, new content will be discussed in keynotes and panels to shed light on the ICT and telecommunications industry's latest trends, namely sustainability, green tech, 6G, metaverse, the new generation of chipsets and the telecom sector's resilience. New panels such as "Women in ICT" and a special panel powered by AWS are also on the agenda.

Our partners this year are all industry leaders, and we're proud to welcome: du, e&, EY, AWS, Console Connect and PCCW Global, Huawei, MTN GlobalConnect, NEC, Netcracker, Nokia, Cisco, CSG, CommScope, Emircom, MYCOM OSI, Reailize, SES, Sofrecom, China Mobile International, GBI, Mavenir, MEF, ZTE and APTelecom.

The Telecom Review Leaders' Summit will host the ITU-CXO meeting on December 6, which will be attended by global CTOs and technology VPs from around the world. This will mark the sixth time that the Telecom Review Leaders' Summit has hosted this prestigious, invitation-only meeting.

Register now to attend the 16th edition of the Telecom Review Leaders' Summit, whether in-person or online.

Do not miss the largest edition yet and be part of our success!

Are You Ready for an Exceptional Summit?

Excitement is building as we get closer to the most anticipated ICT and telecommunications event — the 16th edition of the Telecom Review Leaders' Summit. This year's event, under the theme "Global, Regional, Digital," will be held on December 7-8 at the Intercontinental Hotel, Festival City, Dubai, UAE.

07-08 DECEMBER 2022

Intercontinental Dubai Festival City, UAE

GLOBAL, REGIONAL, DIGITAL

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The two days will provide the perfect opportunity for attendees to learn more about the industry from a rich array of content

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The 16th edition of the Telecom Review Leaders' Summit will build on the success of the 15th edition, which saw the participation of C-level executives from over 56 countries, making it a global summit with a regional contribution.

In the framework of its theme 'Global, Regional, Digital', the Summit will focus on the industry's main trends, including cloud, cybersecurity, digitalization, sustainability and infrastructure, among others.

The two-day hybrid summit will target 600+ in-person attendees from all corners of the globe in the ICT ecosystem. An additional 2000+ attendees are expected to participate virtually. These two days will provide the perfect opportunity for attendees to learn more about the industry from a rich array of content and programming presented by leading international experts.

The event will gather, both physically and virtually, esteemed C-level executives representing mobile, wholesale and satellite operators, vendors, solution providers, enterprises, regulators, governments, NGOs, consultants, analysts, broadcasting companies and OTTs.

New Diversified Content
This year, new and diverse topics will be discussed, with new panels such as "Women in ICT" and a special panel powered by AWS also on the agenda.

The 16th edition of the Telecom Review Leaders' Summit will tackle the industry's latest trends and developments, including:
• The Role of ICT Leaders in Shaping Digital Economies
• The Future of Technology: 6G, Metaverse, the New Generation of Chipsets and Digital Inclusion
• The Importance of Incorporating Sustainability in Telcos' Strategies
• The Importance of Data Regulations and Policies
• Boosting Network Performance: The Role of the Wholesale and Capacity Industry

Official Opening Keynote

H.E. Eng. Majed Al Mesmar
Director-General, TDRA

- The Recipe for the Right Infrastructure Deployment
- Influencing the Role of Women in the ICT Sector
- Outcomes of Digital Strategies and Execution

Distinguished High-Level Speakers
International C-level speakers will convene at the industry's largest VIP gathering. New speakers will be joining the Telecom Review Leaders' Summit for the first time from notable industry players, including the Amazon Web Services international offices, China Mobile, EY, IBM, NEC, NEOM, Telefonica and UAE Cybersecurity Council, to name a few.

ITU CxO Meeting
The Telecom Review Leaders' Summit will host the ITU-CXO meeting on December 6, which will be attended by global CTOs and technology VPs from around the world. This will mark the sixth time that the Telecom Review Leaders' Summit has hosted this prestigious, invitation-only meeting.

> New speakers will be joining the Telecom Review Leaders' Summit for the first time from notable industry players

A Platform for Announcements

With such a large gathering of global leaders and industry professionals, the 16th Telecom Review Leaders' Summit is the perfect occasion for telecom and ICT brands to showcase their solutions and interact with attendees in the demo area. Indeed, it will be the perfect occasion to sign those much-sought-after partnership agreements and MoUs and announce all exciting new deals.

Such news and announcements made during the Summit will receive full coverage by Telecom Review's team of journalists, videographers and photographers available throughout the event.

Telecom Review Awards

On the evening of December 8, the success and achievements of leading ICT brands will be honored at the Telecom Review Awards Gala Dinner taking place at the Intercontinental Festival City Hotel in Dubai. The Telecom Review Excellence Awards give industry leaders a chance to celebrate the things they do well and acknowledge when it all comes together. The submission process itself is a great opportunity for you to brush up on your marketing skills.

Winners are chosen based on recognized and demonstrated capabilities in their specific sector by an independent panel of 15 experienced industry veterans.

"The Telecom Review Awards recognize the hard work and innovation that companies and their employees from around the world have achieved in the operation of their business. Telecom Review is always proud to recognize these special achievements, and we look forward to doing so for several more years to come," commented the Chief Awards Officer, Jeff Seal.

This year, the award categories have been divided according to regional and global recognition, and new award categories have been added to further support our partners in their journeys toward success.

How to Register

For in-person registration, fill out all required information at: https://www.telecomreview.com/summit/index.php/registration. Registration confirmation will be sent to all registrants once this form is submitted and validated. For virtual participation, registration can be done at this link: https://us06web.zoom.us/webinar/register/WN_o9jBI-ZaSXeBkHjcPruWvA **TR**

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THE LARGEST VIP
ICT gathering

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07-08 DECEMBER 2022

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ITU Set to Hold Next Plenipotentiary Conference in Qatar

The International Telecommunication Union (ITU) will hold its next Plenipotentiary Conference, known as PP-26, in Doha, Qatar, four years from now.

The Plenipotentiary Conference, where delegates representing ITU's 193 member states set the organization's four-year strategic plan and budget, is the ITU's highest decision-making body. ITU is the United Nations' specialized agency for ICT, with a mission to help connect the world sustainably while leaving no one behind.

The decision to host PP-26 in Doha was adopted by consensus among the member state delegations during the second week of ITU's current Plenipotentiary Conference, PP-22, in Bucharest, Romania.

The quadrennial gatherings serve as milestones on the path to global digital transformation, which ITU aims to align with United Nations sustainable development priorities.

"I applaud the decision to hold the next ITU Plenipotentiary Conference in Qatar, the successful host nation of previous important ITU events," said ITU Secretary-General Houlin Zhao. "PP-26 – marking less than four years until 2030 – will support accelerated digital uptake, which is crucial for achieving the UN Sustainable Development Goals and ensuring that everyone is connected by the end of the decade."

Zhao recalled Qatar's hosting of ITU's World Telecommunication Development Conference in 2006, the Connect Arab Summit in 2012 and ITU Telecom World in 2014.

"The State of Qatar has a strong ICT infrastructure that is compliant with international standards, making it one of the leading countries in the world in this regard," Qatar's Minister of Communications and Information Technology, HE Mohamed bin Ali Al Mannai, said in his proposal to host the conference in Doha. "The State of Qatar is also a world leader in organizing and hosting major events, including high-level global and regional conferences across a variety of sectors."

ITU's member states have elected a new leadership team for 2023–2026, headed by Secretary-General-elect Doreen Bogdan-Martin, who is currently the Director of ITU's Telecommunication Development Bureau.

Salam Delivers Best Internet Video Experience in Saudi Arabia

Salam, a leading ICT operator in Saudi Arabia, has been recognized for delivering the Best Video Experience in the Kingdom, based on consumer-initiated tests run through Speedtest® by Ookla®, the global provider of network intelligence and connectivity insights.

At an awards ceremony held on the sidelines of GITEX Global in Dubai, Ahmed Al-Anqari, the company's CEO, received the certificate of award in the presence of Ookla CEO Doug Suttles and key Salam management executives.

Ookla results showed Salam as the winner of the Best Internet Video Experience Award with a Video ScoreTM of 80.59 based on its analysis of Speedtest Intelligence® data, covering Q1-Q2 2022.

Ahmed Al-Anqari, CEO, Salam, said, "Salam is a home-grown success story and its recognition for Best Internet Video Experience by Ookla is a testament to what an innovative local company can achieve in the MVNO market. We are proud of this recognition which supplements our transformation to build a human-centered technology company that brings the best connections to our neighborhoods and allows our customers to experience a richer digital lifestyle."

"The latest Ookla data reflects our unrelenting efforts to improve customer experience and stay ahead of their digital requirements, be it in gaming or streaming, so that they may pursue their passions", he added.

This achievement reflects Salam's continuous efforts to set its customers free to experience a richer digital life without limits, and also comes within the framework of its strategy based on providing the latest and most advanced technology services, products and solutions in the communications and information technology services sector, in response to its customers' ever-changing needs and future aspirations.

Ookla first introduced the Best Internet Video Experience Award in Saudi Arabia earlier this year, marking the first time that internet providers in the Kingdom were assessed for the service.

Salvador Anglada, CEO, e& enterprise

e& enterprise CEO:
Cloud and AI Largely Impact Customer Experience

e& enterprise is impacting different verticals with its different technologies and digital solutions. In an exclusive with CEO Salvador Anglada, he shared the essence behind its latest acquisition, the core strategies behind creating business value, the importance of customer experience and the emerging trends within the enterprise business space.

Partnerships and collaborations are one of the pillars of e& enterprise. We've just heard about your Smartworld acquisition. Can you give us details about this recent venture?

We're going to merge Smartworld with our own to create one single unit and rebrand it as part of the e& enterprise family as "e& enterprise iot and ai."

We are very happy with the acquisition that we just completed because it will reinforce significantly our capabilities as a system integrator, specifically in the IoT space. We have a big practice as an e& enterprise, but this acquisition solidifies the implementation and operation of the different solutions that we have in the market. We're going to lead more at this stage.

Can you share the core strategies of e& enterprise in creating business value in different sectors?

I would say that there is no single vertical that we are not impacting, thanks to our different technologies and digital solutions.

All across, we are creating value as we have big practices in different verticals of activity. One of the big ones is on the government and smart city sides — helping the districts to automate and optimize the way they are doing things in terms of technology.

Good examples are projects like Hassantuk, which is the fire alarm system for the whole UAE, or projects that are allowing us to automate the whole smart grid for electricity companies, allowing users to have much more information and create efficiencies. Alongside that, we're working a lot on Industry 4.0, using technologies like robots and drones, as well as digital twins, where we replicate the processes of the companies that allowed them to optimize on the digital side.

You recently launched the EngageX CPaaS platform to elevate the

quality of customer experience for enterprises and government entities. What is the importance of customer experience for e& enterprise's long-term growth?

The importance of customer experience is absolutely critical. Improving customer journeys in this new world will allow us to compete, regardless of the vertical.

In the past, the way to interact with a customer was either through a call center or by going into a shop. Today, the opportunities are massive — you can go to the website or an app, using tools like WhatsApp or a virtual agent.

With EngageX, what we're doing is helping customers in their relationship with their own customers by opening up different digital channels where they can interact and create smooth processes with their customers. We understand the business of the customer. Thus, we propose a way to move forward by redesigning the process and implementing all of these in our platform. And that creates the experience that the customers are looking for.

From your perspective, what trends in the enterprise business scene will progress in the Industry 4.0 era?

Everybody talks about digitalization, but now for me, it's a must. You will not be able to compete in the future if you don't use digital technologies and you just leverage your business.

Maybe the most important one for me, and it is still something that we are lagging behind compared with other countries in the world, is the cloudification of your business. Cloud is important because it is not just an efficiency gain, it's a customer experience gain. Moving your applications to the cloud, and even creating a cloud-native application, is critical to expanding your business, interacting with different customers and having the ability to scale up and down and be more agile.

The other one that I think is very important and still has a long way to go is artificial intelligence. The idea of using the data that we produce in

predicting what is going to happen is crucial for both the frontend and backend. On the front side, AI will result in understanding the customer on what they must follow in order to acquire a new product or service, and forecast the business properly.

While on the back side, this will mean understanding what the point of failure is on specific elements of your processes and trying to act in advance in order to gain efficiency. There is a big opportunity, and we are democratizing this with our tools and our platform. I predict a big expansion of AI usage in different verticals, particularly in the region.**TR**

> There is no single vertical that we are not impacting, thanks to our different technologies and digital solutions

UAE Traces Cybersecurity Path for the Digital Era

With the acceleration of the digital era, cybersecurity and data privacy continue to be of great importance for organizations and governments, with security officers now represented at board and cabinet levels. There is now an urgent need for collaboration across sectors to address pressing cybersecurity concerns.

At Huawei, we believe the UAE's efforts to prioritize cybersecurity are essential for the nation's digital transformation. Through the UAE Cybersecurity Council, the country is setting new standards for the region and the world on how to digitally transform a country in the connected, intelligent era as well as turning the UAE into a trusted digital oasis. This is based on the realization that cybersecurity is critical in forging a secure and trustworthy smart ecosystem built on AI, 5G, cloud and many other cutting-edge technologies.

Huawei endeavors to support the UAE in all these digital transformation initiatives, leading by example to provide cybersecurity thought leadership for these technologies in the industry. Our work with the UAE's Cybersecurity Council demonstrates how collaboration can lead to win-win scenarios. In March of this year, the

Council signed an MoU with Huawei to strengthen strategic cybersecurity collaboration based on the public-private partnership (PPP) model. The partnership seeks to promote cybersecurity innovation, develop cybersecurity capabilities and nurture a robust cybersecurity ecosystem. In addition, the agreement aimed to create an open, transparent and trustworthy environment between the UAE Government and technology vendors.

Secondly, regular engagement with the cybersecurity ecosystem is vital to building capabilities for all. Huawei recently took part in the 3rd edition of the Cyber Security Innovation Series (CSIS) UAE Chapter, endorsed by the UAE Cybersecurity Council. The CSIS hosts in-depth discussions around national, political and economic interests to promote favorable policies, procedures and solutions for cyber and IT executives. During the event, Huawei joined industry leaders and key influencers within the cybersecurity space and participated in various panel discussions as well, delivering keynotes on trending security topics that included cybersecurity challenges of the future; best practices and effective strategies to create a cyber-safe society; and why cloud security is important for businesses.

To further affirm Huawei's growing profile in the cybersecurity space, Huawei was awarded the "Cyber Security Company of the Year 2022" for the second year running, while the Huawei Enterprise Business Group (EBG) took home the "Best Enterprise Security Solution of the Year 2022" award. The awards were presented by His Excellency Dr. Mohamed Al-Kuwaiti, chairman of the UAE Cybersecurity Council. The recognition demonstrates Huawei's position as a regional cybersecurity thought leader, strengthens trust with all stakeholders in the ecosystem and enhances regional customers' confidence in Huawei.

Moreover, Huawei's partnership with the Organisation of Islamic Cooperation – Computer Emergency

Response Teams (OIC-CERT) demonstrates our vision of open collaboration to tackle security challenges. As a member of OIC-CERT, Huawei worked with other stakeholders to develop and deliver the OIC-CERT 5G Security Framework in OIC member countries to help safeguard their journeys to 5G. This is especially important because OIC member states need their standards and guidelines to build regional multilateral norms, which are essential to ensure continuity, availability, resilience and cyberspace sovereignty for Islamic nation-states in this increasingly fragmented world.

As a leading global provider of ICT infrastructure and smart devices, we must also ensure our products are trustworthy and secure. Our solutions are developed and delivered by observing security-by-design and privacy-by-design principles that empower our customers to safeguard their digital futures. This cybersecurity leadership is built on innovation; Huawei has allocated US$750 million to cybersecurity, and 1,500 company employees work full-time in this field.

As cybersecurity professionals, we take pride in seeing security get its due recognition as a critical business enabler and the Chief Information Security Officer (CISO) recognized for their unique value, their ability to switch effortlessly between communicating technically and speaking the language of risk to their peers on the executive management team and the board simultaneously. As we gaze into the crystal ball of our digital future, we herald the age of the CISO, where the CISO of tomorrow is the last line of defense to protect our digital assets in a world where data is the new oil.

But we must ensure our efforts are grounded in reality and not lost amid the fancy titles and trends. This is true when you look at modern cyberspace, which is littered with jargon, trends and newfangled concepts. From the "Metaverse", which prompted Facebook to change its corporate name to Meta, to the various other nomenclature such as "Industry 4.0",

"deep tech", or even "digital future", there's no shortage of fads in the industry. Even the cybersecurity industry has developed its own set of terminologies such as "Zero Trust," "Trusted Supply Chain" and "APT," among others.

Amid all the buzzwords and fads, one should not forget that solid fundamentals will always prevail. When the going gets tough, go back to the basics; cybersecurity muscle memory will subconsciously repeat a specific set of processes and procedures with improved efficiency and accuracy acquired through practice and repetition, which reduces the margin of error and streamlines processes and procedures in any cybersecurity function.

Ultimately, the aim is to forge a robust security posture for all organizations. However, this means managing the delicate balancing act between processes, technology and people. Humans remain the weakest link in this triangle, with recent findings showing that 88% of cyber breaches involve human error. To address the human factor, it's crucial to invest in the public's cybersecurity literacy, which involves more regular user education programs and, more importantly, fostering a culture of security in your organization. Indeed, solid capacity-building for the youth in the cybersecurity domain is a pre-requisite in today's digital world, as is upgrading and upskilling for experienced hires or anyone considering a mid-career switch.

The cybersecurity challenge is complex. Huawei believes cybersecurity is a shared responsibility that cannot be addressed by one person, organization or nation alone. Huawei is ready to contribute its know-how and collaborate in an open, transparent and collaborative platform with all cyberspace stakeholders to ensure end-to-end cybersecurity that will be critical to realizing our vision of building a fully connected, intelligent world. **TR**

By Aloysius Cheang, chief security officer (CSO), Huawei UAE

Ahmed Reda, TMT Sector Leader, EY MENA

Fuad Siddiqui, Global 5G Industry and Emerging Tech Leader, EY

Telecoms Push for Innovation: New Technologies, Capabilities and Partners

In an exclusive joint interview with Ernst & Young Global Limited (EY), Telecom Review welcomes the expert opinions of EY MENA TMT Sector Leader Ahmed Reda and EY Global 5G Industry and Emerging Tech Leader Fuad Siddiqui regarding the region's top trends, digital transformation demands and connectivity strategies, among their other valuable insights.

From your perspective, what are the top five trends that will continue to impact the technology and telecom sectors in the MENA region?

Ahmed: Telecoms are moving up the value chain to deliver comprehensive end-to-end digital services to businesses and consumers where the key drivers are demand from customers, digital business services market opportunities and future revenue streams. The sector is seeing multiple opportunities opening up due to the digitization of economies leveraging the telecom operators' networks. Moreover, the changes in consumer behavior, driven by waves of digitalization, are opening up new opportunities in telecom services.

The top technology catalysts that can aid telecoms in their transformation towards delivering end-end digital services are mainly; 5G, Cloud, Internet of Things (IoT) and Cybersecurity. The 5G technology is a top priority for telecom leaders, and it is a game changer for the telecom industry due to the paradigm shift it is likely to bring to the industry. However, telecom companies are rethinking the scale and pace of their 5G investments due to concerns such as interoperability and sensitivity issues in network, reliance on third-party vendors and the broadened attack surfaces. Cloud technologies have become a key enabler for telecoms because of the wide array of benefits they offer. Telecoms are leveraging the cloud platforms to develop radically new value propositions that will create new business models and offer a whole new customer experience. Also, telecoms leverage IoT to deliver radically different solutions, such as connected cars, Smart City solutions and other IoT platforms for Industry 4.0, etc.

It should be mentioned that while telecoms are working hard to capture the market opportunities leveraging the above-mentioned technologies, they would need a paradigm shift from their "deploy first, protect later" mindset to a "shift-left" practice to consider cybersecurity aspects as early as possible in the implementation of these technologies.

The transformational power of 5G is evident in the MENA region. What more can be done by service providers to ensure that networks remain productive, resilient and scalable?

Fuad: Most service providers in the region have successfully launched their commercial and consumer 5G offerings. The bigger and more strategic opportunity is in the B2B and B2B2X segments. The enablement and digitalization of sectors — like energy, manufacturing, transportation, logistics and agriculture — is the new growth opportunity for telcos. However, the real test will be how service providers prepare and pivot. EY analysis shows a US$700 billion global opportunity by 2030, across some of the major sectors. Value capture will require the development of an integrated tech stack, including mission-critical secure 5G and edge cloud solutions with embedded AI; allowing the ability to extend these capabilities to enable improvements in these sectors through productivity gains and sustainability benefits is key. There is already some early evidence of such business performance improvements in many of the

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Telecoms are moving up the value chain to deliver comprehensive end-to-end digital services to businesses and consumers

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sectors. For example, the World Economic Forum's Global Lighthouse Network initiative showcases many enterprises across sectors who have seen benefits. To target this opportunity and enhance the scope and scale will require a different way of rolling out a resilient, reliable and secure architecture with open APIs that is modular and standardized, but with appropriate customization on a per-sector basis to support emerging use cases.

What is the best approach for integrating digital and customer experience for long-term value creation?

Ahmed: Digital transformation and integration are forcing companies to change their business models and adapt to the new market reality. This change is being driven by the customers themselves. Today, customers expect relevant content and service in relation to their needs anytime, anywhere and on any device of their choice. To keep up with this new kind of customer, businesses must embrace technology to deliver an unmatched customer experience.

Nowadays, customers often rate organizations on their digital customer experience first. Mobile apps, machine learning, automation and many others allow customers to get what they want almost exactly at the moment they want it. This has caused a shift in customer expectations, resulting in a new kind of modern customer. This new market reality forces organizations to change and embrace digital transformation as the center of their business strategy.

Digital requires one to rethink how to interact with customers. For B2B and B2C sales teams, digital means moving more to social selling. For marketing teams, digital means reducing the spend on offline marketing activities and using digital channels, account-based marketing and email marketing strategies. For customer service teams, it is all about being proactive in the way you help customers. Social media, review sites, forums and communities are

all now part of the customer service ecosystem.

Everything is now happening in real time, which is why companies need to offer immediacy, personalization and accessibility to their customers.

From your perspective, what are the core strategies for ensuring that digital advancements are aligned with highly beneficial future use cases?

Fuad: One important dimension to ensuring the success of these use cases is building the capability and partnerships with ecosystem players. The 2022 EY Ecosystem Study found that 69% of business leaders credit ecosystem partnerships as a critical aspect of their success. Sectors in the region can further enable the creation and growth of new types of companies by leveraging these partnerships. Looking at the telco sector, we are seeing strong momentum, with some establishing partnerships with hyperscalers. Some telcos have also started partnerships with AI/ML companies. In some global cases, telcos have even acquired or invested in ecosystem partners. This is an important consideration from the enterprise client perspective. In the EY Reimagining Industry Futures study, 73% of the executives surveyed want to prioritize suppliers who can provide relevant ecosystem relationships.

Transforming the Saudi 2030 Vision and other national goals into action, how can telecom players remain competitive yet collaborative in delivering their products and services?

Ahmed: Guided by Vision 2030, the telecom industry within KSA has taken a big leap. Liberating and regulating the sector as well as introducing many new players have taken market competition to a new level. However, the sector recognizes that collaboration with competitors is crucial in order to cope with pressure on profit margins and build a strategic advantage.

Increased competition continues to reduce margins, while consumers

demand more sophisticated services at lower prices. On the other hand, telecom operators must comply with regulatory licenses that impose network coverage in unprofitable areas, allowing OTT applications and many other market liberation regulations that impact profitability.

To combat these pressures, telecom operators are considering how to find ways to cooperate by sharing all or part of their largest expenditure areas with competitors. We have seen many initiatives to share network infrastructure costs, radio towers, data rooms, etc.

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With 6G already in talks, while 5G is being widely deployed, which strategies should the technology and telecom sectors follow to maximize connectivity opportunities?

Fuad: By 2030, we will be entering the 6G era, an era of ubiquitous intelligence enabled through a web of interconnected sensory networks that will transcend geographic and technological boundaries. Industry adoption of advanced 5G and associated tech architectures that offer decentralized edge cloud infrastructure and native AI are important prerequisites and are required as a foundation for many other emerging opportunities. 6G will offer extreme connectivity, connecting and federating data across future metaverses and offering a distributed compute infrastructure for Web 3.0. 6G will extend these capabilities with new reach, scale and reliability. Whilst advanced 5G is enabling the fusion of our cyber-physical lives across consumer and industrial domains, 6G will encompass this and add a new dimension by integrating a cyber-life or cyber-human aspect.

Innovation is at the forefront of today's era. How can the MENA region keep up with the ongoing digital transformation demands from consumers and businesses?

Ahmed: Telecoms should set their sights on innovation. Modern product development is key here as it focuses on fast, adaptable development and future-facing projects. It's also essential because it focuses on building a product around the customer. If there's any lesson to be learned from disruption, it's that success lies in meeting changing customer preferences quickly and effectively.

Over the last decade, telecoms' revenue was either shrinking or weakly growing. This can be explained by the slow or no action against changes in the market. We saw major transformation in mobile technology, the rise of mobile apps, changes in customer behavior and new competition from OTT players,

putting big pressure on telecoms' core offerings.

One of the obvious answers for the above challenges is to push for innovation. This means tapping into new technologies, platforms and consumer preferences while acting quickly on the opportunities each one presents.

Some of the areas that telecoms need to invest in to stay competitive in the digital era are: embracing OTT services, leveraging data and enabling the IoT applications. Music, movies and TV are increasingly consumed online, introducing a huge opportunity for revenue growth. Tapping into big data is a rising trend where telecoms have access to huge amounts of data waiting to be leveraged, and many companies could use this data for advertising, predictive network maintenance, credit scoring, etc. IoT applications are countless and can introduce new opportunities in areas such as smart cities, energy management and many other industry 4.0 applications.

How can cellular and emerging technologies be utilized together to shape the growth and transformation agendas within the region?

Fuad: The region has some dominant sectors like oil & gas, energy, transport and logistics that have embarked on their respective digital transformation journeys. By bringing together an end-to-end business and tech stack, consisting of a suite of emerging technologies like 5G, edge clouds, robotics, embedded AI and quantum security, while hashing out the opportunity this presents across sectors, industries can be helped and benefit from reimagining how they currently operate and how they can operate in the future. EY, together with leading energy sector companies, is pioneering this model by looking at how to transform the way refineries, pipelines and terminals operate but also offering such expertise and capabilities to other sectors. Additionally, a specific initiative like KSA Vision 2030 offers a direct role for emerging tech to

future-proof ICT infrastructure investments across both public and private services. One example is the diversification agenda, which includes growth in the agriculture segment. This approach is already changing the way vertical farming is being designed and operated. In smart cities, these emerging technologies will [present] a new way that public safety and citizen services are being offered. **TR**

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> **"**

Nokia: Building Blocks for Mobile Networks' Energy Efficiency and Sustainability

Aji Ed, CTO of Mobile Networks, Nokia MEA

While Nokia brings a digitalized approach to service delivery, the telecom vendor remains committed to reducing the carbon footprint of its network operations. In a Telecom Review exclusive with Aji Ed, CTO of Mobile Networks, Nokia MEA, he shares the importance of sustainability in their strategy and how the Nokia mobile networks portfolio improves energy efficiency.

For Nokia, sustainability means maximizing the positive while minimizing the possible negative impact of activities. What is the long-term sustainability strategy that Nokia plans to work on?

Sustainability is a key component of Nokia's strategy and purpose. We believe digitalization and connectivity solutions are critical to resolving many of the global problems that society is facing today – environmental, social and economic. The solutions we provide can help the world decarbonize and dematerialize, reducing waste, limiting the use of natural resources, and driving the reuse of materials to combat climate change; can help restore failing productivity through the digitalization of industries and society, and can bring more inclusive access to social services and new opportunities.

This is what we mean when we say we create technology that helps the world act together. We realize we cannot do this alone, and we call for accelerated digitalization and enhanced connectivity, greater multi-party, multi-discipline collaboration and the establishment of sustainable platforms that encourage innovation.

We are aiming to use 100% renewable energy in our own operations by 2025. In 2021, we reached a 53% share, and our target for 2022 is 60%.

Our ambitious target is to limit global warming to 1.5 degrees. As the first large vendor in our business, we joined the Science Based Targets initiative with the aim of reducing our scope 1,2,3 emissions from the 2019 baseline by 50% by 2030. Scope 1 and 2 are those emissions that are owned or controlled by a company, whereas scope 3 emissions are a consequence of the activities of the company but occur from sources not owned or controlled by it. Throughout the lifecycle of radio networks, 93% of CO_2 emissions are borne when the networks are in use, and about 8% are created in manufacturing and transportation.

Mobile networks are crucial in terms of sustainability and energy efficiency. What are the building blocks used to improve energy efficiency using Nokia mobile networks portfolio?

Growing digitalization increases energy consumption of mobile networks, which can lead to higher CO_2 emissions, also called the carbon footprint. The flip side of the coin is the carbon handprint - the reduction of the carbon footprint of other industries with digitalization. Mobile networks can actually help societies avoid 10 times more emissions than what they produce. In other words, the handprints of mobile networks are, according to GSMA, ten times bigger than their footprint. As a conclusion, we see that the role of mobile networks is of great importance when aiming for net zero.

Energy costs are often 15-30% of an operator's total OPEX. Although 5G is 10 times more energy efficient than 4G, the exponential growth of mobile data increases the operator's energy consumption. Energy costs have been surging in most markets since the beginning of 2022. Studies in recent Western European cases show that in a 5-year timeframe, electricity OPEX exceeds HW CAPEX.

The global challenge in the ICT industry is the fact that today, about 80% of the used electricity is converted to waste heat. Nokia mobile network products are designed for energy efficiency aiming to reduce power consumption by 15% in every new product generation. This is a good start, but we need to do more also.

To reduce waste heat, we have introduced cooling system innovations such as the liquid-cooled AirScale base station, which was commercially launched at Mobile World Congress 2022 in Barcelona. With liquid cooling, we can capture the waste heat into the liquid and transport it over distances for other use cases, such as circulating the waste heat for building heating. The technology is based on the fact that liquids can transfer 4000 times more heat than air. With our first commercial solution, we can capture about 80% of the waste heat.

At Nokia, we see the following building blocks as essential for reducing mobile network energy consumption and thereby achieving our ambitious sustainability goals.

- RAN Site modernization: It is extremely important for mobile operators to start modernizing their networks with the latest equipment for higher energy efficiency. Based on our experience from different networks, for the same amount of kWh, 4G generates five times more payload compared to 3G, and 5G even much more. This is one of the factors that can drive modernization and frequency band refarming from legacy to new technologies like 4G and 5G. Our newer modules also reduce the site footprint with highly advanced dual-band and triple-band AirScale radios and the latest AirScale baseband systems. This will help reduce energy consumption by up to 50% depending on the site configurations.
- Energy Efficiency features: These include features such as micro DTX (or discontinuous transmission) which allows the base station to identify periods of unused RF resources and switch off the power amplifier for a short duration. We also have a feature to switch off unused capacity layers in the network during periods of low usage, such as midnight or late evenings, for sites covering business districts. The MIMO muting feature enables a good balance between network performance and energy efficiency by switching off MIMO layers (transmitters). There are other advanced features like deep sleep mode which will bring further significant gains in energy consumption.
- Automation for energy efficiency: Automation is equally critical for taking energy efficiency gains to the next level. Nokia's industry-leading EdenNet SON (rated 1st for the past 5 years by industry analysts) allows our customers to address a couple of areas, such as optimizing energy-saving features with machine learning to further reduce radio network energy consumption as well as automating energy-saving features to eliminate human error and maximize the gains.
- Network design and optimization for energy efficiency: A well-

optimized network will always be efficient in terms of power consumption. We always see that a network with bad coverage and quality consumes more power compared to an optimized one. An optimized network will also help users retain their mobile batteries for longer. Our intelligent approach to the RF design of networks focuses the site transmission (RF signal transmission) towards the subscribers (avoiding areas not needing to be covered) while balancing the network performance. This will help reduce energy consumption by up to 15%.

Why is it important for a telecom company to have sustainability at the core of its operations?

Telecommunication is now ubiquitous, and the need to stay connected has become a priority. Wireless communication and radio sites form a sizeable percentage of a telecommunication company's energy needs.

While Nokia is digitalizing its own operations, we are also bringing a digitalized approach to our service delivery. This further reduces the carbon footprint of network operations. Our digital services include:

1. The Digital Deploy platform, which allows managing project collaboration, data flow and task flow digitally. The real-time information sharing means improved operational agility, efficiency and accurate decision-making. Experts no longer need to travel to sites, which means that they can address multiple sites faster, saving time and reducing CO_2 emissions. This translates into a 30% faster site deployment time.
2. Integrating SON with closed-loop automation significantly reduces a lot of operational activities on the field on a real-time basis. In addition to reducing the need for extensive and expensive testing using drive testing and hazardous rigging activity at sites, it also further provides a "greener" approach to crucial optimization activities, further reducing CO_2 emissions. TR
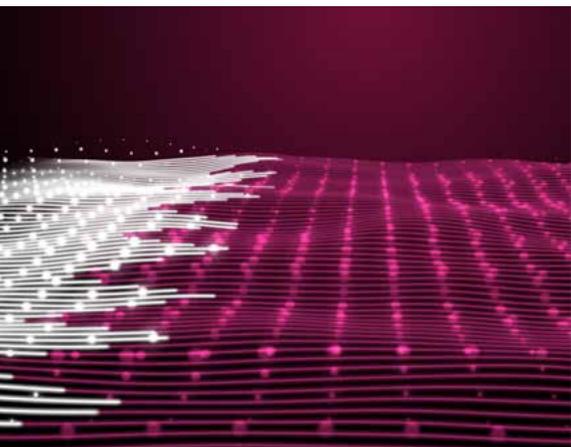
Qatar: Delivering an Innovation-Driven Future

Qatar, a high-income economy sitting at the heart of the Middle East, is home to almost three million people. Through Qatar's National Vision 2030, the country aims to be a truly smart nation and strives to become an advanced society capable of sustaining its development while providing a high standard of living for everyone.

With one of the highest GDP per capita figures in the world — $93.5 billion in 2021 — Qatar ranks fourth in the world as per World Bank's 2021 data of countries' purchasing power parity (PPP). With excellent facilities, modern infrastructure and a mix of local and cosmopolitan cultures, Qatar is among the most dynamic countries in the region.

Laying the technology foundation needed to create high-paying jobs, diversify the economy and attract international companies, ICT modernization is a central focus of Vision 2030. Going digital like its neighboring countries, Qatar is seen as a potential technology hub which is why it is critically important that the country establishes its position in the ICT industry.

From the upcoming 2022 FIFA World Cup to the promising digital transformation initiatives in play such as the Qatar Smart Program (TASMU) and the e-government 2020 strategy, Qatar is an ideal location for integrating key ICT technologies for the 21st century. Its active research and development (R&D) efforts are also vital for providing solutions to society's pressing problems.

Qatar's ICT landscape

The government of Qatar endeavors to build a vibrant ICT sector that will spur the development of an advanced knowledge economy and a prosperous, sustainable future for its people. In the field of ICT development, the country has demonstrated solid progress, anticipating $9 billion in ICT spending alone by 2024.

ICT has played a fundamental role in advancing the technological agenda of Qatar. In Qatar's ICT research study in 2018 conducted among business establishments by the Ministry of Transport and Communications (MoTC), data revealed that 67% of ICT enterprises feel that the FIFA World Cup will drive the adoption of ICT in Qatar, while 57% believe that Qatar's National Vision 2030 will do the same.

In 2004, the Supreme Council of Information and Communication Technology (ictQATAR) was created as the nation's ICT policy and regulatory body, responsible for serving as the government's ICT champion. As the world moves more towards knowledge-based economies, Qatar aims to fully leverage ICT through huge strides in telecom connectivity, internet and emerging technologies such as IoT, artificial intelligence (AI) and cloud computing.

Ø Qatar National ICT Plan

The world is shifting to a new era of innovation and digital transformation, and Qatar is among the trailblazers. Although the speed of such digital transformation differs from country to country, each nation needs to adapt and implement policies to remain competitive.

To this end, ictQATAR established Qatar's National ICT Plan 2015: Advancing the Digital Agenda, which will guide their efforts and is aligned with Qatar's National Vision 2030 and National Development Strategy.

The entire plan is strategically organized into five objectives, which are critical components needed to create a sustainable digital future. These include improving connectivity, boosting capacity, fostering economic development, enhancing public service delivery and advancing societal benefits. We will discuss the first three in this part, and the latter two successively.

Improving connectivity. With the increase in mobile penetration and greater acceptance of mobile broadband as a medium for internet connection, the demand to be mobile is on the rise in Qatar. Indeed, Qatar is in line with the global trend of users requiring more mobility in their connectivity options, as

the on-the-go usability of today's devices rely on online services, anytime and anywhere. As of June 2022, Qatar ranked fifth in the world for mobile speeds and 39th for fixed broadband.

Aiming to meet this increasing growth and demand, Qatar telecom operators Ooredoo and Vodafone have launched 5G services to deliver unprecedented mobile internet speeds with stability. With mobile services based on universally available LTE, coupled with 5G and a strong fiber rollout, the country is aiming to provide gigabit services nationally.

In December 2021, in exploration of innovative 5G solutions to improve the mobile experience of their users, Vodafone initiated a trial of its mmWave spectrum-based 5G network services. Later, in March 2022, Ooredoo announced the successful implementation of a world-first 5G indoor shareable solution, achieving speeds of 1.5Gbps. In support of this, the Communications Regulatory Authority (CRA) will release an additional spectrum for expanding and upgrading 5G networks in the 3.5GHz and 26GHz bands to Ooredoo and Vodafone by 2023. For that reason, 5G networks must cover 99% of Qatar with minimum data speeds of 100Mbps by 2024.

Ooredoo Qatar, the official global connectivity services provider for FIFA World Cup Qatar 2022, works alongside Ericsson to deliver the best 5G connectivity experiences possible. A highly digital, immersive and intelligent Qatar 2022 tournament experience is to be welcomed at the most anticipated sporting event in the Middle East.

In addition, the ICT infrastructure in Qatar is backed by the Qatar National Broadband Network (QNBN). It focuses on the deployment of a passive dark fiber network infrastructure to efficiently leverage high-speed fiber in Qatar. Hence, it can provide equal and open access to telecom service providers (wholesale) and private network owners (retail).

For Qatar and the wider region, the need for reliable internet connectivity and a rapidly growing infrastructure has also driven the regional deployment of submarine cable networks. In partnership with Gulf Bridge International (GBI),

the provision of subsea connectivity and cable systems is the backbone of Vodafone Qatar's internet network.

Developments like the Qatar Internet Exchange Point (QIXP) and IPv6 migration make Qatar a global connectivity hub. QIXP serves as a meeting point between ISPs and digital content service providers (CSPs) for the exchange of data and information, ensuring faster and more secure access to digital content. Relevantly, the timely migration to IPv6 will ensure adequate quantities of IP addresses are available in Qatar as IPv6 networks and websites become increasingly prevalent worldwide. Qatar's success in charting a smooth transition from IPv4 to IPV6 is a result of a clear national implementation strategy coupled with the assigning of identified roles and responsibilities related to the project through the Qatar IPv6 National Taskforce.

Boosting capacity. For digital inclusion, the government is committed to developing a skilled ICT workforce in Qatar and helping people to stay current with the necessary ICT skills for success. The skills gap is being addressed through various programs coordinated between government organizations, academia, training agencies and private sector enterprises – and continuously promoting the ICT talent ecosystem's innovation and growth – thus enabling the building blocks of ICT in realizing Qatar's ambitions.

A prime example is the MoTC's National Skilling Program, in collaboration with Microsoft. 50,000 people will be trained by 2025 on advanced digital skills to boost the country's regional and global competitiveness. In parallel, the first-of-its-kind Digital Center of Excellence was also inaugurated in Doha to create a highly-skilled workforce.

To train local talent for developing smart tech, Huawei has also opened its doors to an AI lab at Qatar University as a part of its ICT Academy. Here, students will be able to sharpen their skills by working with IoT and machine learning within a platform that encourages smart tech innovation. In 2021, Huawei announced plans to train 10,000 ICT professionals in Qatar over the next three years.

Fostering economic development. Entrepreneurship is also highly impacted by ICT. One of the major success leaders in this stewarding is the Qatar Science and Technology Park (QSTP). For over a decade, this premier hub has been driving the development of new high-tech products and services, supporting the commercialization of market-ready technologies and contributing to the economic diversification of Qatar.

In its commitment to supporting aspiring entrepreneurs every step of the way, QSTP has on offer: the Arab Innovation Academy, the first and largest tech-entrepreneurship program in the pan-Arab region; XLR8, a 10-week program providing intensive training and mentorship; and ELV8, a launchpad for the global growth of Qatar's tech startups. To date, QAR 4.3 billion has been invested in research, development and innovation activities by international companies registered at QSTP, with over 5,000 people working at QSTP-based companies since 2008.

Research shows that in 2021, 24 startups in Qatar raised $10.2 million, of which 16 were funded by accelerator programs run by Qatar Fintech Hub (QFTH), a fintech incubator and accelerator, among others. The digital-focused businesses are still nascent, and the Qatari market is still in need of new verticals and new ideas where all sectors can flourish. The Ministry of Communications and Information Technology (MCIT) has also established several initiatives to support startups like the Innovation Lab, which aims to create and enable an environment for collaborative R&D and adoption of innovative solutions, the Digital Incubation Center for those who want to kickstart their tech-related business and the TASMU Accelerator that provides a wide-range service allowing the startups to grow and assist in the realization of a diversified economy.

Digital Qatar
Studies continue to show that Qatar's government is one of the most technologically advanced when compared to its global peers, making its citizens among the most digitally connected in the Arab world. Going back to the objectives of the Qatar National ICT Plan, we'll now look at the e-government

and societal integration within the country.

Without a doubt, digital technologies are playing a vital role in building the future economy of Qatar and accelerating its digital transformation. The US Chamber even commented, "the manner in which Qatar develops and implements policies that regulate the digital sector will be an important factor in attracting and retaining investment from global companies and facilitating an enabling environment for the growth of a knowledge-based economy."

Ø Digital Government
The Qatar Digital Government initiatives aim to support government agencies in enacting digital transformations in line with the Qatar Digital Government 2020 Strategy. Envisioned in 2013, an e-government blueprint was put in place to ensure that all individuals and businesses will benefit from connecting online with Qatar's more open and efficient government.

This will make Qatar's government more effective, accessible and customer-centric. In this context, Hukoomi, Qatar's official online information and e-services government portal, has grown exponentially in years and is now offering over 1,400 services, more than 650 of which can be completed online by businesses, residents, visitors and civil servants.

Furthermore, common application and infrastructure projects have been digitally achieved, including the government correspondence project (Tarasul), the human resources management project (Mawarid), and the electronic registration and documentation service (Tawtheeq). According to PWC, a new strategy titled Qatar Digital Government 2026 is underway to focus on proactive service delivery to individuals based on data and AI systems that predict the actual needs of citizens. The strategy will also focus on transferring the infrastructure to local cloud computing to achieve scalability, cost-effectiveness and harmonious governance.

All ministries in Qatar are joining forces to to accelerate Qatar Digital Government initiatives, achieving

high digital correspondence for faster, secured and efficient delivery of services by government departments and institutions.

Ø Smart Qatar (TASMU)
One of the most innovative cloud-based smart city solutions with excellent artificial intelligence, big data and cybersecurity capabilities, the Smart Qatar (TASMU) platform aims to contribute to the growth of Qatar's digital economy and strengthen the country's competitiveness through ICT.

It targets five priority sectors, namely transportation, healthcare, logistics, environment and sports, where advanced technology and innovation can be harnessed to provide smart solutions and applications — from providing convenience and entertainment to addressing critical needs such as national safety and security.

In parallel, MCIT launched TASMU Digital Valley (TDV), one of TASMU's flagship initiatives, to help achieve the vision of Smart Qatar by linking digital solution providers with available opportunities in the market and facilitating the establishment of digital startups from ideation to commercialization.

Transportation. With the aim of creating a world-class smart city, the TASMU program selected transportation as a priority sector, enabling the development of a searchable city that offers its residents universal access to safe and seamless transportation. To further improve and integrate the entire mass transit system, the Ministry of Transport recently launched the Transportation Master Plan for Qatar 2050 (TMPQ) to increase public transport accessibility by 50%, reduce annual fuel consumption and harmful emissions by 43% and up to 73% respectively, and transition 25% of its fleets to electric by 2022.

Healthcare. Already operational on the TASMU platform is the Virtual Consultation, a healthcare smart solution developed in partnership with the Ministry of Public Health during the onset of the COVID-19 pandemic, ensuring members of the local community could access medical advice, diagnoses and prescriptions from the comfort and

safety of their homes. Embedding digital technologies into healthcare solutions can shorten emergency response time, give doctors more data and tools to make more informed decisions, and empower patients with different options including remote patient monitoring, digital support groups and smart medication.

Logistics. While infrastructure and architecture have already enhanced the lives of people in Qatar, the logistics industry has also adopted many modern and well-designed aspects of technology to reduce cost, time and dependency. Among TASMU's key focuses are a virtual convenience store, a drive through mall, a digital auction marketplace, smart lockers and container e-booking. Such will positively promote Qatar into becoming a global trading hub, one that can attract the type of foreign direct investment that will take its logistical capabilities to the next level.

Environment. In the environment sector, TASMU's Digital Farmer Community solution has been successfully piloted in collaboration with the Agricultural Affairs Department of the Ministry of Municipality and Environment (MME). This initiative grants all farms in Qatar full access to the smart solution that integrates real-time weather data from the Qatar Meteorology Department and high-resolution satellite images from the Center for Geographic Information System. Precision agriculture, vertical farming and expert network-as-a-service are some of the digital use cases to solve environmental problems.

Sports. To establish Qatar as a world-class destination for the sports fan experience, athletic training and innovative sports equipment implementation, TASMU offers augmented home viewing, event companion applications and stadium fast track. Qatar is definitely primed to develop a gaming and eSports cluster with its advanced ICT infrastructure and its youthful population. Deploying 5G and having a world record 99.7% internet penetration, opportunities exist for gaming companies to develop interactive experiences linked to major sporting events such as the FIFA World Cup 2022 and Asian Games 2030. **TR**

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Satellite Networks:
Game-Changers for the Telecommunications Industry

In recent years, with projects in low earth orbit such as Starlink, OneWeb and Kuiper, the market for telecommunications satellite constellations has experienced a revival. The pioneers of the nineties, such as Iridium and Globalstar, did not succeed in finding a market still dominated by low bandwidth at that time. But how is the situation different 30 years later when demand and supply have increased considerably?

Services Designed for Fixed Broadband Telecommunications The constellation offers are not portable communication services, as the customer equipment is rather a set of boxes/parabolas that require a significant power supply and have a large physical footprint.

The main end customers are corporate sites or private homes subscribing to broadband Internet services. In terms of the market, we speak of fixed telecommunications.

However, geostationary satellites already cover this type of need via operators like Eutelsat, so how are these new services game changers?

The two disruptions that constellations bring are a better latency (they are located at less than 1,500 km from the ground against 36,000 km for the current systems) and potentially a better price (the space capacity could be multiplied by 10 according to Euroconsult, and the cost of the connectivity could drop considerably).

Companies ready to use these services are concentrated in certain verticals: energy, maritime transport or raw material extraction. These businesses have their operations far from urban centers densely covered by fiber. These activities are not particularly cash-strapped and have already invested in satellite telecommunications services when they've needed them. Communication latency is not an insurmountable problem for these customers, who have adapted their applications to geostationary satellite constraints.

Private homes in rural areas are already benefiting from satellite offerings that meet traditional needs (e.g., streaming and social networking).

Ultimately, performance in speed (less than fiber) and latency (less than 5G) remains well below the standards of dense areas.

However, Euroconsult predicts that this connectivity market (currently worth $3-4 billion), which has been fairly stable until now, could triple as a result of the deployment of constellations. This would create a rational market where lower prices could stimulate new demand, which in turn would encourage the development of new uses in a virtuous technical and economic circle. We name it the "eco-techno push."

Low-Speed Mobile Telecommunications Services
Premium cell phones can already communicate with satellites (e.g., Iridium system). These capabilities are now extending to ordinary smartphones. Apple has just announced that the iPhone 14 will be able to send SMS via GlobalStar satellites. But it seems that the size of a consumer smartphone antenna, for physical reasons, is incompatible with broadband internet transmission. In terms of uses and services, the services would finally primarily be voice/SMS, or low-speed data (remember the WAP protocol).

In Sub-Saharan Africa, more than 90% of the telecom market is dominated by mobile services, with an average monthly revenue per phone of less than $10. We are only talking about the lucky 60% who have cell phone service. The barriers to Internet access in low-income countries (as defined by the World Bank) are access to electricity (only 42% of the population of these countries) or the cost of the smartphone (several months of average salary).

More affordable satellite-capable phones could bring universal internet coverage, with important development and inclusion impacts, but ultimately with uses closer to the 3G world.

Where Other Logics Precede Marketing
Satellite networks also respond to other logics.

The first logic is that of venture capital, where there is an opportunity to conquer a market, even if this requires anticipating a demand. The

first movers have the possibility to consolidate the market and others, to sell at the best price at the top of the bubble. This is facilitated by an environment of abundant liquidity. The constellations also offer a "beautiful story," which refers to the "New Space" where pocket satellites, reusable rockets and the conquest of Mars are mixed in a new frontier atmosphere, as Silicon Valley loves it.

As an illustration of the capitalist machinery, the pioneer OneWeb filed for bankruptcy in 2020 – its first investor, Softbank, had invested $2 billion – and was relaunched by an Anglo-Indian consortium led by Bahrti, which invested $1 billion and finally merged with Eutelsat in 2022, which invested $500 million in turn. All these players remain shareholders in the new entity.

The second logic is that of the "conquest of the west," where those who deploy the most satellites will conquer the largest piece of space. So instead of looking for an impossible business plan, one of the objectives could be patrimonial: the constitution of a property whose value will be much higher than the cost of a satellite launch, a space version of the virtual land that some people buy in the metaverse.

The last logic is strategic. The conflict in Ukraine revealed that a civilian satellite Internet network – in this case, Starlink – could be used for military purposes. From a perspective of sovereignty, the main geopolitical blocks (European Union, China, USA, …) must control their constellations independently of their profitability. The Chinese, the Europeans, the Russians … all now want their own constellation.

Thus, LEOs are at the crossroads of several logics. A frenzy for technology and beautiful stories; the privatization of the orbital resources in the last "New Frontier" rush; and the new "Great Game" of space powers. Finally, old-fashioned marketing takes a back seat. **TR**

By David Erlich, consulting director for B2B and strategic marketing, Sofrecom

Arbaeen Zeyara Pilgrimage:
Nokia and Asiacell Ensured Super Network Performance at Super Crowded Event

The Arbaeen Zeyara Pilgrimage is one of the biggest annual religious pilgrimages in the world, primarily to the Holy City of Karbala in central Iraq. From the 28th of August, millions of pilgrims marched towards Karbala, passing through the cities of Diwaniah, Najaf, Hilla and Naseryah.

According to official statistics, this year 21.9 million pilgrims visited the holy cities of Karbala during the event, with participation peaking on September 16th — the highest number of visitors ever recorded for this event. As Iraq's leading telecommunication services provider, Asiacell needed to ensure that its network had the required capacity and availability to accommodate the Arbaeen Pilgrimage with the best customer experience possible, especially in the shrine area of Karbala (~1 km2) and the roads leading up to it, where traffic on some throughways had increased by 600%. This was in addition to the dynamic mobility of subscribers between Hila and Karbala during the peak days of the event.

This exceptional increase in network traffic required careful planning and execution to ensure that the network ran optimally throughout the gathering.

Solution
Asiacell, together with Nokia — as the end-to-end (E2E) multivendor optimization vendor including RAN, IP, transport, and core — started a rigorous preparation three months ahead of the event, including network expansions and capacity dimensioning. However, with traffic increasing more than 300% compared to normal days and international

roamers increasing by 1000%, operating on safe capacity margins was not possible due to physical site limitations of the shrine area "site acquisition." Massive optimization work before and during the event was done to smoothly handle this exceptional traffic volume, pushing the equipment to its maximum utilization and performance. Before the event, 27 specific radio intelligent capacity features had been implemented. On the transport layer, on top of the capacity planning and E2E audits, a major exercise was conducted on network topology optimization and traffic localization to reduce transport layer risks and reduce latency.

A War Room was established to provide 24/7 support for any critical challenges and issues throughout the event and to shift traffic between technology layers (2G/3G/4G, IP and MW) to avoid congestion. During the event, more than 761 live optimization actions were implemented successfully without user performance degradation.

All of this support was in addition to the deployment of field teams of all expertise, who were testing and reporting field measurements to ensure and confirm optimal customer experience.

Results and Benefits
Although the actual traffic exceeded the foreseen forecast by more than 15%, the event management was extremely successful, with peak active data sessions reaching more than 2 million active sessions during the peak hour and more than 1.2 million international roamers camping on Asiacell's network. There was also a more than 194% data increase versus 2021 in Karbala only, mostly in the Shrine area.

The smart implementation of QCI's and overall quality of service (QoS), based on predicted customers' behavior and traffic trends, had a very positive impact on the overall customer experience, even during peak hours and max air interface utilization.
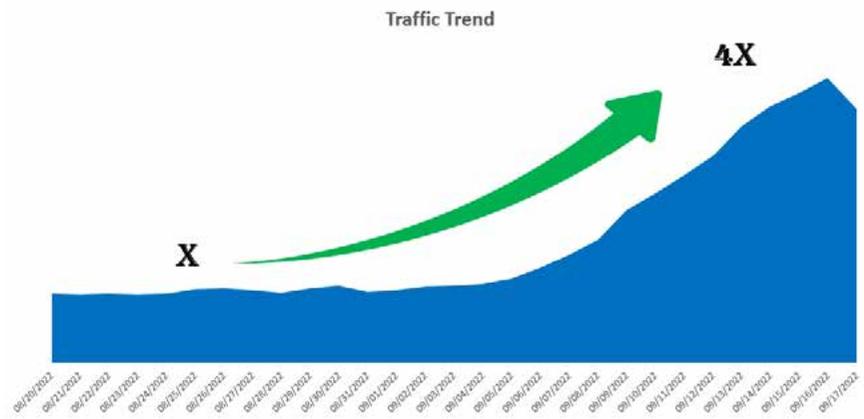
During Arbaeen Zeyara, data traffic increased by four times compared to normal days

Thanks to very detailed planning on transport and core domains, multiple failover scenarios and traffic localization, the network availability was at 5 nines (99.999) resiliency, with significantly improved overall end-to-end latency.

The benchmarking showed Asiacell's network's superior performance versus other operators — from a customer experience and throughput perspective — with stable accessibility and retainability of more than a 99% success ratio achieved by Asiacell. And this was clearly a stupendous success in ensuring superior network performance, especially when the network witnessed one of the highest traffic densities worldwide in terms of Erlangs and Gigabytes per Km2.

Furthermore, zero major incidents were recorded during the gathering, despite forecasts being exceeded in the major cities.

Hisham Siblini, chief technology and IT officer of Asiacell, said: "It has always been part of our strategy to continuously improve our network performance and quality of service to our customers. For us, Nokia's network optimization capabilities have been one of the key investments made to achieve this."

Samar Mittal, VP, core networks and services business at Nokia MEA, said: "We are very pleased with the results achieved during this landmark event and looking forward to continue working with Asiacell to deliver best-in-class network performance and reduce operational cost, while driving the highest quality of service to its customers." **TR**

> The benchmarking showed Asiacell's network's superior performance versus other operators, from a customer experience and throughput perspective, with stable accessibility and retainability of more than 99% success ratio

Harnessing Hyper-Automation and 5G Standalone Capabilities

Driving unique convergent experiences will be key to new service innovation for telcos as ubiquitous connectivity becomes standard. From impressing wide-eyed tourists to meeting the demands of competitive industry players, seamless and reliable connectivity will play the differentiator for the ultimate customer experience for telcos' offerings.

Although at an early phase, the 5G standalone (SA) network can rev up the application of 5G use cases across industry verticals, optimizing the network capabilities for automated and AI-based technologies for enterprise use cases such as energy, utilities, manufacturing, and agriculture. In Non-Standalone Architecture (NSA), the 5G Radio Access Network (RAN) and its New Radio (NR) interface are combined with the existing LTE and EPC Infrastructure Core Network, 4G radio and 4G core, respectively. However, with a 5G core designed as a Service-Based Architecture (SBA) that virtualizes network functions altogether, the 5G SA excels in uplink (UL), end-to-end (E2E) latency, edge computing, etc., and is apt at providing a broader user experience.

Furthermore, automation is increasingly becoming the operators' strategic advantage to maximize the speed and agility of 5G deployment and operations. As an augmentation, hyper-automation is an extension of the automation drive. Gartner defines hyper-automation as a combination of tools, including robotic process automation (RPA), intelligent business management software (iBPMS) and AI, which supports quick and accurate decision-making to identify, evaluate and automate as many business and IT processes as possible. As such, hyper-automation enables scalability, remote operation and business model disruption.

Leveraging 5GSA and Automation
Building on these two evolving technologies, telcos can truly push their expertise to unimaginable heights.

The 5G SA private networks can power mission-critical systems and applications that require ultra-reliable and low latency with water-tight security.

For instance, du is already experimenting with 5G controlled robots over its private 5G SA network, leveraging AWS's data transfer solution, Snowball Edge, and Athonet technologies' cloud-native 5G SA core network. During a demonstration, du explored use cases,

including providing 5G ultra-reliable low latency connectivity (URLLC) to remote-controlled robots for on-site inspection in risky environments such as energy applications, manufacturing, security surveillance and others. With advanced autonomous sensing and analyzing capabilities, these robots are ideal for maintaining safety in all types of facilities, along with high-grade data processing at the network edge for faster actions. In 2019, Etisalat now e&, tested 5GSA in the 3.5GHz carrier with a spectrum of 100MHz. Using a Standalone (SA) smartphone, throughput of over 1.5Gbps was achieved in download speed and 200Mbps on the upload speed, enabling the seamless management of upgrades and migration from NSA to SA. Since then, e& has been providing a whole new set of digital solutions for consumers as well as enterprise, including ports, oil and gas, government and critical infrastructure through 5G use cases. Recently, Etisalat by e& and Huawei collaboratively rolled our network slicing services for consumers and enterprises, enabling new and innovative 5G services and bringing about seamless connectivity for gaming, entertainment, healthcare, etc.

Similarly, Nokia deploys 5G SA private wireless networks in Flex Brazil's manufacturing facilities in Brazil that support wireless applications, operational data transfers and greater layout flexibility on the factory floor. Nokia Digital Automation Cloud (Nokia DAC) will provide the private wireless on-demand service as well as MX Industrial Edge computing and digital-enabling applications. As an industry 4.0 player, Flex Brazil provides services such as advanced simulation, automation and robotics, analytics, IoT and additive manufacturing (3D printing) to its global customers. Offered as SaaS, Nokia DAC combines plug-and-play 4.9G/LTE and 5G industrial-grade network connectivity with on-premise edge computing to provide data management and processing in support of real-time applications for smart manufacturing, predictive maintenance, remote operations and many other applications.

Interestingly, by deploying one of the region's first 5G SA technologies, Zain

KSA has been driving innovation in the largest 5G network in the Middle East and Europe. Zain KSA's extensive network that covers 51 cities across the Kingdom through over 5000 towers has enabled it to become the first telecom operator in the world to provide the 5G carrier aggregation feature with top Internet speed globally. 5G SA provides network slicing features that facilitate a range of services, such as Zain Cloud services, which guarantee superior user experiences. Moreover, leading telecom vendors such as Ericsson and Huawei are enabling 5G end-to-end (E2E) network slicing to revolutionize cloud gaming services, which are today witnessing a massive uptake across the Middle East and Asia regions.

Times Are Changing Fast
The current advancement in mobile technology is dizzying, to say the least. To get straight to the point, telecom operators are already doing trials for holographic calls, fine-tuning them to make them as casual as a normal phone call. The trial platform uses 5G connectivity to construct realistic 3D imagery that has been unachievable until now. For creating the holograms, technologists use the smartphone's front-facing (selfie) camera to capture and transmit a real-time three-dimensional holographic image of the user before running it through an advanced 3D rendering engine to deliver a "virtually there" experience or even overlay it onto a physical setting using VR/AR glasses. Such experiences, which are normally limited to the realms of sci-fi films, are gradually inching towards becoming a reality. Telcos would do well to anticipate these developments, to catch up fast and, accordingly, strategize to strengthen their future offerings.

The combination of 5G SA technology and hyper-automation innovation can serve a vast array of future digital aspirations for both the consumer and enterprise sectors. These technologies will support and enhance deliverables, helping businesses build in an organized, reliable, cost-effective and energy-efficient manner within a fully integrated digital ecosystem. **TR**

Escalating Needs and Expectations on Network Spending

The discussion regarding a cost-sharing framework between telcos and digital content providers is resonating ever louder in Europe. As the region faces an economic inflection point, building long-term resilience requires a smarter and more innovative approach.

The European Telecommunications Network Operators' Association (ETNO), which represents Europe's main telcos, warned that "a large and growing share of network traffic is generated and monetized by large technology platforms." Hence, telcos such as Orange, Vodafone and Telia argue that network investments from their side disproportionately benefit the Big Tech companies because they don't share the costs for network upgrades.

Big Tech should contribute to the "costs of networks to ensure their economic and environmental sustainability" as networks are the essence of connectivity and at the heart of telecom operators' business. With increasing competition from OTTs and hyperscalers, operators' focus has shifted beyond coverage and speed to the quality of experience and value creation.

Network Upgrades Come With Cost

Tech companies are being pushed to help pay for the rollout of 5G and fiber cables across the European Union. These shared investments are also vital in contributing to more sustainable economies and driving efficiencies. Countries like France, Spain and

Italy have petitioned the European Commission to formulate a legal framework to mandate OTT platforms into financing network infrastructure.

The cost-sharing argument by telcos is based on the notion that these digital content providers are consuming more bandwidth, which can put a strain on network capacity.

To be able to handle the surge of data traffic, telcos must upgrade their networks accordingly. A Frontier study has calculated the cost of delivering OTT traffic on European networks and determined an annual cost ranging from €36 billion to €40 billion.

As a result, network operators are persistently negotiating to involve OTTs in order to receive fair payment for conveying their traffic to end customers. Creating an economic model that can rationalize the cost and benefits shared among all network participants must be fair and not put anyone at a disadvantage.

In the current digital era, deploying next-generation networks (NGN) has much higher fixed shared and/ or common costs as compared to legacy networks. Thus, an effective cost allocation method of services is required. This reflects the relationship between traffic volumes, service quality and capacity. As recommended by experts, an allocation key using quality of service (QoS) and bandwidth requirements is ideal instead of the traditional network utilization process.

In defense, streaming and internet companies said that they do have their own investments in systems that positively impact telcos. These include vast networks of data servers that allow content to be delivered at the edge — closer to a telco's networks — which shortens the distance data travels and reduces costs to consumers for "transit charges."

More Digital Requires Better Service, Cost Reduction
To be fit for the digital age, mandating tech companies to share telecom infrastructure costs is one of the considered options for optimization. As

we know, telecom services are offered to two distinct groups of customers with quite different patterns of demand: business and individual customers.

Accenture Strategy analysis suggests that established CSPs are only targeting a fraction of the cost reduction they need to capture profitable new market growth. It has been revealed that the top 50 CSPs' current cost-reduction plans will achieve only 35% of the savings needed to invest in growth and infrastructure.

The network upgrades being done provide extra capacity for growth and will future-proof the network as new and growing technologies, including fiber-to-the-home (FTTH) and 5G, are rolled out commercially. Network upgrades are a significant long-term investment that ensures telcos can continue meeting customer expectations, both now and in the future.

These significant investment requirements increase the urgency to save costs further. With uncertain macro-factors at play, telcos must implement strategic measures to optimize their cost structure in order to increase and sustain profitability amidst delivering quality and value-added services.

Telcos will continue to be forced to make major network investments, and the cost of doing this alone is expected to result in a drop in revenue in the order of 15 to 30%.

Having a mix of technology-enabled solutions and collaborations will allow the telco business model to transform in the years to come. What we are seeing as a trend in the telecom sector now is a shift from offering basic connectivity to enabling critical services across Industry 4.0 industries.

Thinking digital is deeply embedded in the present-day telco business models; it not only provides their own digital products and services but also the essential connectivity infrastructure needed to function and grow in the digital economy.

In the UAE scene, etisalat by e& (Etisalat UAE) and du have deployed LTE networks providing national coverage, while the 5G penetration rate is the second highest globally. To help increase the capacity of 5G networks of today and keep up with growing data demand, the government has allowed for the 2G (GSM) networks to be closed down, letting the spectrum and other assets be re-purposed for 5G by the end of 2022.

The rising prominence of digitization and advanced technological requirements offer great potential for ICT services in both the public and private sectors. CSPs then need cost-effective tools that not only support delivering on the promise of 5G but also strengthen their ability to get a more valued RoI.

Analysys Mason's research found that CSPs can realize IT cost savings of approximately 25% over a five-year period by adopting telecom services delivered through a software-as-a-service (SaaS) model.

The Next Generation of Telecom
The future of telecommunications is data-centric and new horizons are being opened by spectrum, Wi-Fi offloading, backhaul optimization, alternative vendor models and infrastructure sharing. To prepare for the next generation of telecom growth, particularly in the MEA region, operators will need to make sufficient investments in their core business to maximize revenue and garner funds to build or buy the infrastructure needed to deliver better services.

From a regional perspective, the telecom sector in the MEA region is in the midst of strong growth and investment, driven by a technology explosion and strong demographics. The growth engine of the future telecom industry is a digital ecosystem, propelling the growth in demand for data services as well as financial and commercial offers.

A huge potential will be captured by operators who, by making smart investments in the core business of connectivity, will become leading digital telcos in the years to come. **TR**

Fatima Al Mazrouei, director of project management office (PMO), General Directorate of Residency and Foreign Affairs (GDRFA)

GDRFA: Technology Is a Tool That Can Enhance and Keep Upgrading to Provide More Efficiency

Smart innovation and determination can make all manner of transactions faster and smoother, enhancing the customer's experience and overall quality of life. In this exclusive, Fatima Al Mazrouei, director of project management office (PMO), General Directorate of Residency and Foreign Affairs (GDRFA), talks about the government entity's GITEX participation and shares insights about technology, digital transformation and customer experience.

What is GDRFA at its core, and how is this reflected in what you are showcasing during GITEX?

We are the entity in Dubai that can collect biometric information and store it for the purpose of using it in any enhancements to our services for entry and exit for passengers in the city.

This year, we participated in GITEX with over nine digital projects. The main attraction is our data screen, which is showcasing our facial biometrics… where GDRFA has a lot of system improvements due to automation. We're using less human interaction to finish the services for our customers, which is becoming much more efficient and results in less usage of our employees' time.

We are also focusing on the integration with government and non-government entities where we benefit from their data and they benefit from ours to make the transactions faster for our customers.

Other projects that we are showcasing at GITEX include our newly launched application for GDRFA, which includes new services. We have a roadmap to keep including the remaining GDRFA services so the customer can easily go to the application and apply for residency or visa, pay a violation or any other services they need. We're also showcasing models of some futuristic projects that we are studying to see how we can implement them by using big data technology with artificial intelligence.

We are also looking into different ways to provide services to our customers. In GITEX, we are showcasing the next way to do entry and exit for passengers, either by using a portable tablet or kiosk [with] the passenger to finish his transaction. If there is any delay or there is a lot of traffic of passengers, we have to use smart ways to make the transactions faster and keep things moving so that they are always happy and receiving a quality of life.

From your perspective, how will technology impact citizens' lives in the long run?

Technology is a tool that we can enhance and keep upgrading to provide something much more efficient. When we say efficient, it means speed. We always focus [on] service where the time that it takes for a customer to finish his own transaction is made shorter. When you make it shorter, the customer is much happier, because they don't have to wait to finish the service that they applied for.

This is always our focus. Thus, technology is a way for us to see which type is beneficial for us as a government sector in Dubai, allowing us to keep enhancing our systems. We already have systems and we already have technologies. But what is the added value or something extra that we can put in to keep making it better and better?

Artificial intelligence is the main thing because you can keep building on it. As you can see in our stand this year, we're focusing on biometric information, and we've put a message through this GITEX that GDRFA is aiming, in the future, to use facial biometrics in all future transactions. Why? Because facial biometrics is a very efficient tool to use to speed up the process.

With the technologies you mentioned — facial biometrics and AI — how do you ensure security?

When there is a technology, the first question that comes to our mind is "is it secure?" Is the data, when using technologies like AI, secure when moving into the system, storing, processing and checking the quality? Is it processed properly? Is it saved properly after being processed? These are important questions that we always focus on because we hold sensitive information for everyone who enters and exits from Dubai.

Our data, as long as it has a high quality check, can benefit not only us in the long run but also other government, semi-government and non-government entities so that they can focus on enhancing their services. As a whole, if everyone keeps improving their services, Dubai customers, in general, would be happy.

What more can we expect from GDRFA in contributing to the UAE's digital transformation journey?

GDRFA is already in this process because we have implemented some major changes in the entry and exit protocols. We already use biometric information to process passengers without using any documents. This is a testimony that GDRFA is on the right track and is aiming for something that is much more efficient and faster by using and relying on technology in all of our services mentioned.

But with any technology that comes, we always assess it and see what is more suitable for us to benefit from. There's so many technologies coming out, such as the metaverse, but it doesn't mean all technologies are beneficial. We need to see which one provides us with the highest benefit, and we utilize that. And definitely, we always go with the vision of Dubai and we always put it in our roadmap to implement, now and in the future. **TR**

> Technology is a way for us to see which type is beneficial for us as a government sector in Dubai, allowing us to keep enhancing our systems

Femi Oshiga, VP of sales, service providers, MEA & APAC, CommScope

CommScope's Mindset in Building Equipment: Network Capacity and Longevity

In this exclusive interview, Femi Oshiga, VP of sales, service providers, MEA & APAC at CommScope, discussed how they, as a leading network infrastructure provider, help telecom operators in deploying 5G and continuously contribute to the digital transformation of the industry at large.

5G deployments are gaining momentum regionally and globally. How is CommScope supporting network operators to run 5G networks while also integrating with the existing legacy networks for a smooth transition to 5G?

Network providers have a challenge today — they have a lot of spectrum and they have to deploy 2G/3G/4G and now 5G networks. They have to do it with their existing assets, particularly the tower space on their cell sites. We help them in a number of different ways. Firstly, by producing high port count antennas in the smallest possible footprint and weight. We also adopt new technologies integrated into the same antenna, so whether it's FTD or TDD, we're trying to put that into one enclosure. And more recently, we have our MOSAIC product that we're showcasing here at GITEX and that involves combining active and passive antennas into one solution.

We all get excited about 5G, but we must not forget the fundamentals coming back to certain types of equipment, but also antennas, cables, filter infrastructure and so on. We help the operators by producing best-in-class antennas. We make sure that these can accommodate technologies pre-5G and make sure that they have a future-proof and abundance of capacity to take on all the challenges that 5G places on them.

We also have to make sure that these types of equipment are capable of additional traffic and that they have longevity in the networks. We think we do this best because that's exactly our mindset when we produce our equipment.

Energy efficiency has become the buzzword across various industry verticals. How is CommScope achieving the green ICT goals and who are your collaborators in this mission to develop sustainable networks?

It's a whole ecosystem. To start with, there are two huge aspects we follow to ensure energy-efficient solutions: having low energy input and using recyclable materials. We also try to make sure that the power consumption of our production is as low as possible.

Lately, we're thinking of ways to take equipment post-deployment back to the factory and see where we can recycle it. We have a number of partners helping us in this journey: our material providers, network operators and even end users. We can all work together in making sure that we bring the overall energy-used carbon footprint down to levels that are most sustainable for the future.

The metaverse economy is set to disrupt the digital landscape. How is CommScope contributing to this transformation? What are the challenges and opportunities?

Let's start with the challenges. Basically, you need high-bandwidth networks with low latency. We need to build upon this capability. You need the right set of equipment at every cell site. In fact, you need to densify cell sites to make sure that you have this full coverage. CommScope solutions provide options for operators depending on the different scenarios, cost of ownership or expected return on investment in delivering the required solutions.

Moving on, the opportunities are endless. We've seen a lot of demonstrations here in GITEX, and I think we're just at the tip of the iceberg. More professional services like healthcare and transport will be involved later on in the metaverse.

How do you see the demands from service providers evolving in the near future, and how will CommScope be impacted by these?

Service providers are the people that provide us with all the juice that we're using on our phones — the connectivity that we need. If you think of how important our phones are to us today, you can imagine that they will be very relevant in everybody's lives in the years to come. They are the providers of the utility that we cannot do without. For them to differentiate themselves in this realm, they have to provide specific, unique and interesting use cases; that becomes their challenge. They will all have different degrees of success depending on the use cases they bring out there. That's the excitement of our industry, and that's where we look forward to collaborating with the MNOs. **TR**

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We have a number of partners helping us in this journey: our material providers, network operators and even end users

Ookla Has a Responsibility to Represent Consumer's Connected Experiences, Says CTO Luke Deryckx

Telecom Review spoke with Luke Deryckx, CTO of Ookla, who shared the company's efforts in providing world-class network intelligence and connectivity insights that are crucial to enhancing the consumer connectivity experience.

From a technical perspective, how do you ensure the security, consistency and reliability of Ookla's network intelligence?

We take the integrity of Ookla's data platform very seriously. As a crowdsourced data provider, we have a responsibility to ensure that consumers are truly represented in the data that we collect. We are fortunate to have a great team of data scientists who have invested heavily in our data methodology to ensure that every result we collect from the crowd can be presented in a way that is truly representative of consumers' connectivity experience.

How do Ookla's end-to-end enterprise solutions influence operators, businesses, government agencies and other tech industry players? Any particular case studies you can highlight from the MENA region?

Ookla has a wealth of data on the performance and quality of networks around the world. And particularly, that is of great value to this region. We have several examples that we can share where Ookla has provided actionable insights for regulators and operators to improve their networks. Just one that I would like to highlight is the pandemic era in the last couple of years. The regulatory authority in Jordan, TRC, has used Ookla's data to monitor the performance, quality and consistency of the consumer networks, to make sure that the citizens of Jordan have been able to have quality connectivity while everything shifted online. They worked with their operators and [Ookla], and have done a great job of ensuring quality and consistent connectivity through these difficult few years.

How do you plan to innovate and keep up with the demands of delivering invaluable network insights worldwide?

Ookla is a global company, and we work with customers in many countries around the world where every market is a little bit different. We are fortunate that we work in a space where there are a lot of standards with connectivity. Hence, we focus on those standards

and consistent measurement across all markets, and we are very scalable in that regard. Of course, we do work very closely with customers and partners in every market in the world that we do business in to make sure that we are keeping up with new trends, new technology that is being implemented, or current technology being used in a new way. It is very important to us that we stay close to that and can represent that in Ookla's data.

Ookla plays an important role in enabling modern connectivity. What is your growth outlook for the ICT industry in the coming years?

The world has changed a lot in the last few years, and the macroeconomic outlook is a little bit cloudy. I cannot claim to know what's coming in the next few years. The one thing I will say is that our industry is so valuable to consumers around the world. It is something that is looked at as a utility just like electricity or water to the home - you need quality connectivity. So, while I think we may not be in for as much explosive growth as we have seen in the last few years, I think there will be consistent growth and a lot of expectations from consumers. **TR**

> Ookla has a wealth of data on the performance and quality of networks around the world

What's the Update on Internet Traffic, Capacity and Penetration?

If you can send your emails, post on social media or have a virtual meeting without hassle, consider yourself privileged, because as of 2022, one-third of the world's population remains unconnected to the internet.

Interestingly, new data from the ITU reveals that areas with low internet penetration have achieved the fastest growth over the past year.

Growth is unevenly distributed across regions, with Europe still the most connected region globally, having 89% of its population online. Despite that, Africa, one of the least connected regions, achieved a 13% YoY growth in internet penetration. Arab states now reach 70% of their populations, while the APAC region grew to 64% in 2022, relative to the region's population.

Taking all this into consideration, an estimated 2.7 billion people still need to be connected online. That is why, despite continued growth, the chance of connecting everyone by 2030 looks ambiguous. Universal and meaningful connectivity is the ultimate goal, especially in rural areas that remain unreachable.

Within the telecom industry, competition in the marketplace, along with sound regulation, is lowering costs, improving quality and easing access to internet services worldwide. Today, smartphones and tablets are gaining the upper hand, one equivalent to that

of yesterday's computers, by providing a wider and better range of functions.

More people rely on mobility for connectivity, influencing the internet's capacity extensively. As faster speeds become a necessity, having the infrastructure for high capacity is integral to keeping homes, workplaces and any other areas of need fully available digitally.

Going Back to Normal
According to ITU data, international bandwidth usage in 2021 reached a worldwide total of 932 Tbps, up from 719 Tbps during the pandemic-stricken

2020. This is a 30% increase over the previous year.

The highest regional total for international bandwidth use is in the Asia-Pacific region at over 400 Tbps — twice as high as in Europe (204 Tbps) or the Americas (180 Tbps).

Thus far, over the course of 2022, global internet bandwidth has risen by 28%, now standing at 997 Tbps. The latest figures from TeleGeography's Global Internet Geography service show that despite this slower growth rate, global internet bandwidth has almost tripled since 2018.

Additionally, the growth in international internet bandwidth and internet traffic remained similar (30%) between 2018 and 2022. The global return to more typical usage patterns also meant a decline in average and peak utilization rates. The average traffic growth dropped from 47% to 29% between 2020 and 2022, while peak traffic growth dropped from 46% to 28% over the same timeline.

TeleGeography supports what ITU has noted above, with Africa experiencing the most rapid growth of international internet bandwidth at a CAGR of 44% between 2018 and 2022. Asia now sits behind Africa, rising at a 35% CAGR during the same period.

With levels going back to normal now, the COVID-related expansion of internet traffic and bandwidth is claimed to be a "one-off phenomenon," pushing network operators to add bandwidth and engineer their traffic in a more calculated manner.

As a trend, telcos, cloud service providers, CDNs and even some data center operators are building their own private "backbone" networks that can bypass the public internet. A big chunk of international traffic may be carried by these networks in the coming years.

Indeed, private networks are the untapped market in the Middle East and North Africa, and Nokia is among those providing technology and services to build those networks for industry 4.0. Nokia's MEA Broadband Index Report

has shown that the data traffic trends clearly indicate a pressing need for the adoption and expansion of 4G and 5G networks across the region. It finds 40% YoY growth between 2020 and 2021 in 4G data traffic and a whopping 350% YoY growth in 5G data traffic.

In preparation for such expansion, players across the ICT industry, including e&, are also merging their connectivity excellence through wireless and fiber means.

In fact, the UAE ranks as the country with the highest fiber-to-the-home (FTTH) penetration while also having one of the most resilient 5G infrastructures in the world. "We have the infrastructure. We have the major capabilities to reach our customers and deliver the solutions they need. However, we need to start looking at our operating models carefully and build on them and make them more agile and scalable," said Dr. Abdulhadi Mahmoud AbouAlmal, director of technology standardization & spectrum management, etisalat by e& during a Telecom Review virtual panel.

Fiber for Increased Telecom Network Capacity
Slow loading websites, buffering movie streaming or video call-freezing are often an issue of network capacity, not solely the speed of your connection. By combining fiber's high bandwidth and low latency with the high capacity and massive peering, fast internet connections can be achieved.

These thin optical fibers are indeed what carry the vast majority of international telecom traffic. ISPs and telcos do their best to make use of their existing capacity, while equipment vendors focus on cost-reducing optical transport equipment at each end of the link.

CommScope has announced its new hardened connector, Prodigy, which is designed to accelerate and simplify field installation for future fiber networks. By utilizing universal, small-form hardened connectors for interoperability across different fiber terminals and cable assemblies, the compact footprint enables smaller,

higher-density terminal footprints. The self-aligning connectors also minimize the chance of connection errors. In addition, to facilitate cable change-outs and upgrades, the Prodigy system allows converter attachments to be deployed without replacing or splicing the drop cable.

Prodigy addresses the key demands of modern FTTH installations: ease of installation, speed, density, reliability, flexibility and scalability.

According to Precedence Research, the global fiber optics market size is expected to hit around $11 billion by 2030. Increasing demand for communication systems having high bandwidth is the main driver of the market's growth, as fiber powers such systems used to smoothly transmit voice, data and images over a distance ranging from a few meters to several kilometers.

The telecom sector accounted for the largest revenue share in the global fiber optics market. It will undoubtedly retain this position as increasing demand for use cases like VoD services, cloud-based applications and audio-video services stimulates fiber optics in the telecom sector.

Optical transport systems are also now being made more compact, more power-efficient and cheaper, making gigabit internet speeds into a reality.

Another testimony of fiber's dominance in connectivity can be seen in Africa. In early 2021, MTN announced the completion of the long-awaited coastal national long-distance (NLD) cable project. Known as NLD 5/6, the impressive 1,822 km fiber route coverage starts in Cape Town and leads up to Durban.

Constructed by Liquid Intelligent Technologies, the NLD 5/6 project has MTN as its key anchor investor, benefiting from fast, secure and stable connectivity as well as more capacity and higher speeds. The NLD also plays a part in MTN's broader initiative to modernize its entire network in South Africa, ensuring that the company is geared for the 4IR and 5G future. **TR**

Zain KSA's 9-Month 2022 Results: Over 100% Growth in Net Profit, Income

Zain KSA shows consistent financial and operational growth upon recording triple-digit growth in net profit and comprehensive income during the first nine months of 2022.

As seen on the Saudi Exchange portal, Zain KSA recorded 170% and 109% growth in comprehensive income and net profit, respectively, during the first nine months of 2022. Comprehensive income reached SAR 516 million compared to last year's period of SAR 191 million, while net profit hit SAR 299 million compared to last year's period of SAR 143 million.

Total revenues amounted to SAR 6.7 billion by the end of Q3 2022, with this quarter alone garnering SAR 2.3 billion — a YoY increase of 15%.

With these results, Zain KSA continues to reflect positive financial performance, backed by strong operational and investment performance and an improved customer experience that leverages the latest digital services. The results are attributed to Zain KSA's efforts to further deepen the 5G experience for all its customers — B2C, B2B and B2G — in addition to the resumption of the Hajj season, which further fueled demand for its services. The expansion of Zain KSA's innovative digital offerings, including the Yaqoot App bundles and Tamam Financing, Zain KSA's FinTech subsidiary, has further driven demand and spurred revenue growth.

Commenting on the financial results, Eng. Sultan bin Abdulaziz Al-Deghaither, CEO of Zain KSA, said: "These results confirm Zain KSA's reliability and attractiveness to our diverse customer base as a 5G partner of choice, an enabler of digital solutions and a market-leading provider of innovative and efficient digital products. During the third quarter of 2022, we continued to deepen our 5G network experience and upgrade our digital infrastructure to serve individuals, enterprises, and giga-projects in Saudi Arabia with the ultimate goal of positioning the Kingdom among the world's future tech leaders and providing ultra-fast, reliable Internet."

"In addition to attracting and localizing the latest technologies, during Q3 2022 we continued to support young national talent and provide employment and training opportunities for them. We participated in the 8th edition of 'A Step Ahead' career fair, where we reached out to young talents seeking to leverage their competencies to accelerate the ICT sector localization," added the CEO.

EITC Transitions to Post-Pandemic Normality With Strong Q3 2022 Results

Emirates Integrated Telecommunications Company (EITC) published its financial results for the third quarter ending September 30, 2022. Revenues increased by 10.5% to AED 3.17 billion on sustained demand for broadband and mobile services. EBITDA grew 18.5% to AED 1.3 billion, thanks to a sharp increase in service revenues and gross margin expansion. Net profit increased by 12.7% to AED 319 million.

CEO Fahad Al Hassawi said: "This quarter's results have been excellent on all fronts. Our business environment has clearly transitioned to a post-pandemic normality. We are benefiting from the UAE's economic dynamism and healthy macro trends. Our results validate the efforts we deploy to provide new products and services, improve customer experience and execute our transformation journey. All these initiatives have laid the foundations of our commercial momentum.

"Our service revenues are recovering and growing at an encouraging pace; we generated service revenues in excess of AED 2 billion for a fifth consecutive quarter. Our profitability continued to improve on a sequential and year-on-year basis. We have invested and will continue to invest in our infrastructure to give our customers a simple and the best available experience in the UAE."

The mobile customer base grew 14.7% to 7.4 million subscribers, showing sustained performance in the postpaid segment with net additions of 32,000. The prepaid customer base of 6 million remained stable compared to the previous quarter. Moreover, the consumer broadband customer base increased 53.8% to 510,000.

Breaking down the revenues, mobile service revenues continued their recovery by surging 10.7% to AED 1.4 billion, while equipment sales generated revenues of AED 176 million. Fixed services revenues soared 22.2% to AED 892 million, buoyed by the continued strong performance of the consumer segment. In aggregate, service revenues increased 14.8% to AED 2.3 billion.

e&'s Q3 2022 Shows Solid Performance, Achieves AED 2.5 Bln Net Profit

e&, formerly known as Etisalat Group, announced its financial results for Q3 2022. The telco's consolidated revenues reached AED 13 billion, an increase of 5.5% at constant exchange rates. Consolidated net profit was AED 2.5 billion, a YoY increase of 1.9%. At constant exchange rates, its revenue increased by 5.5%.

The number of etisalat by e& subscribers in the UAE reached 13.3 million in Q3 2022, representing an increase of 11% over the same period last year, while aggregate group subscribers reached 162 million, a 4% increase.

solid performance underpins the ongoing progress of the Group's ambitious plans since it entered a new chapter of its journey as a global technology and investment conglomerate earlier this year. The establishment of focused business pillars as part of its transformation journey has contributed to its organizational agility and allowed for strong strategic partnerships, as the Group continues to explore the diversification of its local and international portfolios.

e& Group CEO Hatem Dowidar said: "e&'s performance in Q3 2022 reflects our unwavering commitment to accomplishing more for the benefit of our customers, shareholders and the communities we serve. We are focusing our efforts on adopting flexible and agile business models that fuel our growth through innovation and creating new value

propositions. Given that e& was built on strong foundations, we remain confident in leading change for growth by reinforcing our commitment to enhancing the quality of our innovative solutions to meet and surpass our customer expectations through the accelerated digitalization seen in the business landscape. We will continue our efforts to seize new growth opportunities and pursue strong partnerships that will ultimately maximize the potential of a holistic digital transformation for our customers and the societies we serve."

"Our resilience to spearheading digital transformation journeys will be enhanced as we drive value from our core, build a stronger regional footprint leadership, grow our adjacencies organically and achieve exemplary results for the benefit of all," concluded Dowidar.

Vodafone Oman Utilizes Netcracker's Data-Driven Capabilities

Vodafone Oman has added analytics, DevOps processes and an integration layer to its ongoing engagement with Netcracker. This expanded partnership will further add to the operator's data-driven capabilities, allowing it to grow and enhance its business and deliver an improved experience for customers.

Vodafone entered the Omani market in December 2021 as the Sultanate's third mobile operator, leveraging Netcracker Advanced Analytics to achieve end-to-end visibility across its business and operations and gain improved system availability and resilience. Netcracker

DevOps Enablement includes a number of components to help Vodafone improve its DevOps processes as part of an overall operational transformation.

The operator will also utilize Netcracker Support & Managed Services to optimize and improve business performance and extend coverage for Netcracker's products and surrounding third-party systems. Overarching these projects is a new integration layer that will be critical to improving customer management, including functions such as service onboarding.

"After a successful partnership with Netcracker to support the launch of our mobile business less than a year ago, we are taking the next step to leverage critical data and bring in DevOps and managed services processes to further improve our business and operations," said Stelios Savvides, technology director at Vodafone Oman. "By using these functions alongside a robust integration layer, we are confident that we will achieve increased revenue, lower OpEx and improve our engagement with our customers."

"By extending our relationship with these new projects, Vodafone in Oman is placing a high level of trust in Netcracker, which is an honor for us," said Benedetto Spaziani, GM at Netcracker. "Our cutting-edge work with data and analytics, along with DevOps tools, processes and managed services best practices, will give Vodafone the advantage in the market and with current and future customers."

Global Tech Ambitions: A Time to Make or Break

2022 has been marked by both tensions and innovations around the world. While necessarily picking up from a pandemic-stricken recent history, the global fiscal comeback is currently facing economic hurdles, the solutions for which technology must play a critical role in.

More than ever, innovation must set a long-term target and initiate from a start-from-now mindset. Strategic moves distinguish top economic performers who have already made progress on their digital transformation paths. Allocating capital, ensuring strong IT capabilities with digital future-ready skills, enforcing fair policies and integrating digital technologies are key to becoming a digital powerhouse.

No matter which country you are in today, the impact of going digital – both from the public and private sectors – can already be felt. Rural and unreachable areas may be an exception, but most regions are taking steps to keep up with the world's rate of digital transformation, which furthers impact through smarter governance, competition and partnerships.

The World Is Going Digital
The rise of the digital economy has further intertwined and widened global integration as a new wave of digital technologies has come into the space. Beyond just internet-based companies, the entire stack of IT firms and their technologies are also involved, including semiconductors, hardware, software, e-commerce and payment services, among others.

The prevailing attitude toward IT and digital's resultant impact on jobs and the economy is overwhelmingly positive. Having a digital-first financial inclusion strategy – one that's cloud-powered, data-driven and built on greater access to reliable high-speed internet – can help countries take steps to formalize their economies and help their citizens become more empowered and more inclusive.

Simply put, a successful digital transformation must rest on the foundation of a smart digital strategy – one that can be perfected by implementing wise investment choices to maximize competitive growth and advantage.

Many countries now have their digital strategies in place to pioneer and kickstart such digital development on the value-creation front. Such planning is necessary now because, in many digital realms, network effects create a "winner-takes-all" situation, one in which first movers and intelligent followers ultimately have the edge.

A Glimpse of the Global Picture
According to the 2022 Global Innovation Index (GII) published by the World Intellectual Property Organization (WIPO), among the top 25 economies that are global leaders in innovation, Estonia makes notable progress this year, as does the United Arab Emirates (UAE) and Poland.

As per specific regions, North America, composed of the United States and

Canada, is the most innovative geographical location in the world. Yet, Europe still hosts the largest number of innovation leaders – 15 in total – that rank among the top 25. These include Switzerland, Sweden, the UK and Netherlands.

Despite the fact that Asia as a region is catching up rapidly with North America and Europe – this because of the huge tech drives in Korea, Singapore and China – the gap with other world regions, like Latin America, the Caribbean and Sub-Saharan Africa, needs urgent attention.

Zooming in on specific countries, we'll begin with Estonia. With its notable "e-Estonia" model, the country remains among strong innovators as per the European Innovation Scoreboard, making the biggest development leap in recent years. With economic constraints such as a lack of natural resources and gas and a population of under two million, the solution was to make the data move easily and make its citizens' lives more convenient and secure.

Next, regarding the UAE, this is an exciting period in the country's business evolution as it considers itself the Silicon Valley of the Middle East. Its digital economy, equipped with among the world's best digital infrastructure, is fast evolving and constantly changing with entrepreneurs, investors and public-private collaborations introducing innovative business models like smart cities, metaverse, AI, IoT and robotics. These are not only making processes easier and more sustainable, but they are also opening the country toward becoming a long-term technology destination of choice for start-ups and digital nomads.

Poland is also on the rise and set to become a major tech hub in Europe, with the country's collective IT expenditure growing to nearly 17% in 2021, totaling more than $20 billion. In the first three months of 2022, venture capitalists have already invested a total of €251 million in Polish businesses, and more impressively, Poland has the third-best developers

globally, just behind China and Russia, and has the largest pool of developers in central and eastern Europe, accounting for nearly 25% of the entire developer population in the region.

In the Americas, countries in both Latin America and the Caribbean (LAC) are said to be facing the most serious socio-economic crisis since World War II, experiencing widening inequality and development gaps due to the COVID-19 pandemic. Transportation has been key to sustaining the overall economy, and through digital transformation, this sector can bring unprecedented efficiency gains from greater visibility and streamlined and multi-stakeholder processes; improve the overall quality of services; and diversify its income sources through new services generation.

In the African context, the market dominance of Chinese tech companies like Huawei and ZTE in the telecom sector – from the construction of digital infrastructure such as data centers to the export of technologies like 5G – has led to the widespread adoption of Chinese technology standards in the region.

Contentions to Be Settled

Regarding the innovative steps taken across various countries, some debatable information has also arisen.

In the UK, the government has consistently hailed science and technology as keys to the nation's long-term prosperity, but a report from the House of Lords Science and Technology Committee has found that the UK's strategy to become a "science and technology superpower" requires clear and consistent policies to realize its full potential.

Additionally, China's drive for homegrown innovation, fueled by tensions with the West, could lead to a decoupling of the country's technology from that of the rest of the world, according to business specialists, while other Asian nations continue to specialize and compete mostly in hardware and components. Yet, the Chinese government is pushing for better R&D, smart manufacturing

facilities and a more sophisticated digital economy. Adding quality alongside quantity will be crucial to fulfilling China's innovation ambitions.

Moving to the West, shaping the global IT and digital economy in ways that are aligned with US interests is one of the most important challenges facing the country's foreign and economic policies. Even Europe has been unable to nurture data-driven business models through a large domestic market and is seen to be lagging on effective innovation because firms do not embrace IT, ecosystem-based business models.

Beyond building a values-based narrative around the digital economy, transatlantic cooperation can also be instrumental in creating a level playing field for European and American companies to compete with Chinese companies.

Conclusion

Despite the economic downturn we are seeing, investments in science and innovation have been remarkably resilient, and technology adoption has continued to record positive growth rates. In terms of broadband penetration, as of today, 17 out of every 100 world inhabitants are connected to fixed broadband, compared to just 9 out of 100 in 2011. With only 3 billion people remaining unconnected, the speed and efficacy of internet and broadband deployment worldwide have been one of the most successful unveilings in the history of all technologies.

And technology will undoubtedly continue to play an increasingly important role in advancement, growth and innovation in all parts of the world. The digital age's next wave will take some time to fully materialize and overcome numerous obstacles, particularly in the areas of technology adoption and diffusion. Innovation will prevail, however, and result in more sophisticated and advanced ICT solutions to increase productivity and profitability as well as greater opportunities to build an improved and sustainable blueprint for the modern world. **TR**

GITEX GLOBAL 2022:

Accelerating Digital Economies Into the Urban Future

Telecom Review was among the esteemed media partners who were present during the biggest tech event in the world. GITEX GLOBAL returned on October 10–14, 2022, and featured 5,000 companies in 26 halls, located within the Dubai World Trade Center's two million sq. ft. of exhibition space.

Exclusives from e&, Huawei, du, Ookla, China Mobile International, Nokia, Radisys, Amdocs, Red Hat, Unifonic, MediaTek and DEWA, among others, were featured by the

Telecom Review team during the five-day event.

The GITEX 3.0 edition, in its 42nd year, presented its most empowering curation ever, with seven multi-tech themes covering today's key fields, including the metaverse, a decentralized

internet and a sustainable global digital economy.

Huawei MEA Innovation Day 2022
On the sidelines of GITEX GLOBAL 2022, the Huawei MEA Innovation Day 2022 was held in collaboration with AICTO, under the theme "Collaboration

to Unleash Innovation for Sustainable Digital Future."

Toni Eid, founder of Telecom Review Group and CEO of Trace Media, moderated a panel discussion held during the event's first session, entitled "Green ICT," geared toward Sustainable Future Sectors and Industries in the MEA Region. The panelists included Dr. Jassim Haji, president, International Group of Artificial Intelligence in Bahrain; H.E. Dr. Elsadig Gamaleldeen Elsadig Karar, director general of the Telecommunications and Post Regulatory Authority in Sudan; Dr. Fahem Al Nuaiama, Ankabut CEO in UAE; and Dr. Ammar Al Husaini, deputy director general at Central Agency for Information Technology in Kuwait.

Dr. Jassim acknowledged that many businesses had shifted their attention away from sustainability during COVID-19. Additionally, Dr. Elsadig claimed that the ecosystem is now undergoing certain changes, and the telco industry must, therefore, enact some measures to encourage more people to get excited about and utilize the greatest network; 5G deployment was strongly encouraged. He also stressed the importance of researching the potential use of renewable energy sources like solar in basic stations; designing energy-efficient components that protect low power; and introducing water-saving features into the data centers. On another topic, Dr. Fahem discussed energy usage and green power/sustainability in data centers and the cloud, including both public and private clouds. "Increase in capacity requires more power," he said. "Power will play a very critical role in developing the cloud," he added. Dr. Ammar talked about the public and government sectors, in particular, stating that it is essential to have operations that are dependable, secure and scalable. He emphasized that these are crucial in order to maintain the list of services provided by the government. On this point, he distinguished between two major gaps: the technological gap and the skills gap.

Tech At Its Best
The world's largest tech event explored

the aspects of digital transformation through seven dedicated platforms. These included North Star Dubai where start-ups and investors exchanged ideas and strategies for the digital economy; Fintech Surge; Ai Everything; Future Blockchain Summit; Marketing Mania; and two new event platforms: Global DevSlam and X-VERSE.

The world's most innovative tech companies, including Nokia, Ericsson, Huawei, e& and Cisco, were among the top sponsors. Around 250 government entities showcased their latest public-private partnerships and digital projects, including Dubai Electricity and Water Authority (DEWA), Roads and Transport Authority (RTA), Dubai Police, Abu Dhabi Digital Authority and Digital Dubai.

Heralding the current digital phenomenon of the metaverse, the X-VERSE ecosystem explored the Web3.0 immersive experience that merges the virtual and physical worlds and indeed offered various ways of interacting in the virtual world. The Global DevSlam platform hosted the biggest international gathering for the developer community, featuring the world's largest Python conference – PyCon MEA – as well as hackathons and specialized coding workshops.

Other attention-grabbing presentations included a flying car by Chinese company XPeng Aeroht. The two-seat electric VTOL (vertical take-off and landing) managed to pull crowds by the hundreds. According to the company, the X2 prototype is the latest phase of innovation in the aerial passenger drone market.

Robotic technologies on display also stole the show, with various surveillance and rescue ops robot demonstrations. One of the most advanced human-shaped robots was Ameca. Featured at the e& pavilion, Ameca represented a near-perfect human-robot interaction by mimicking human responses using Artificial Intelligence.

The success of GITEX GLOBAL 2022 once again establishes Dubai's position as a true digital hub – one

where fostering innovation and value creation is seen as an integral part of the digital economy. The enthusiastic participation by 170 countries in the tech event underscores the growing importance of the ICT industry as a dynamic industry with massive future potential. Commenting on this year's edition, His Highness Sheikh Maktoum bin Mohammed bin Rashid Al Maktoum, Deputy Ruler of Dubai, and Deputy Prime Minister and Minister of Finance of the UAE, said, "Dubai's leadership recognized very early that technological advancement will determine leadership and competitiveness in the future. Aligned with this vision, Dubai developed a technological infrastructure that rivals the best in the world and built strong partnerships with companies at the forefront of innovation in the sector to catalyze development." **TR**

The success of GITEX GLOBAL 2022 once again establishes Dubai's position as a true digital hub

Huawei Launches RuralLink for More Accessible, Inclusive Mobile Coverage
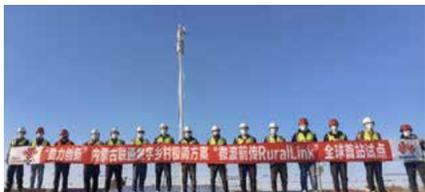
Huawei launched the RuralLink solution at the Global Mobile Broadband Forum 2022 (MBBF 2022). Through site-level innovations, this solution enables green sites, site simplification and easy evolution. This makes it possible for operators to build mobile networks that allow for positive business cycles in rural areas while connecting those who are still unconnected.

The mobile Internet becomes more accessible to people and devices, signaling the arrival of a fully connected, intelligent world. In this context, equal access to mobile connectivity for all has become the cornerstone of economic growth.

Nonetheless, there are still 450 million people who are not connected to mobile networks, most of whom live in rural areas where stable main power and good transportation are not available.

Huawei's RuralLink solution uses unique innovative technologies to solve the difficulties associated with communications. In the areas where fiber is difficult and costly to deploy, thanks to unique microwave fronthaul capabilities, RuralLink uses microwave to replace optical fibers to extend RRUs far away, which reduces network construction costs.

By co-using BBU with existing macro site, RuralLink does not require a BBU to be deployed, which helps reduce site power consumption. By allowing a site to operate with just four to five solar panels, RuralLink is also easily adaptable to the areas that lack stable

main supplies. The solution features a simplified design that enables all devices to be mounted on to a pole, and its site deployment does not require fencing or concrete construction.

As such, site construction is so easy that it could be completed in just three days. RuralLink also supports 2G to 5G services, laying the foundation for network experience upgrade.

RuralLink has already been deployed by China Unicom Inner Mongolia in rural areas. This operator has seen significant improvement in the proportion of areas with good coverage and notable increase in area traffic and average user-perceived speeds. While fulfilling the communication needs of the local people, the RuralLink site deployment also lays a solid foundation for the development of local e-commerce, tourism and smart agriculture.

Mobile Networks, Enterprise: Nokia Q3 2022's Key Factors for Accelerated Growth

To summarize Nokia Corporation's financial report for Q3 2022, the company's net sales grew by 6% in constant currency, hitting €6.2 billion compared to the previous year's quarter of €5.4 billion. Profit for the period is reported at €428 million, increasing by 22% YoY compared to Q3 2021's €351 million.

As supply constraints also started to ease, Nokia maintained good profitability with a comparable operating margin of 10.5%. As for the company's business groups, Mobile Networks and Network Infrastructure made strong contributions to Nokia's Q3 2022 growth.

Mobile Networks sales were reported at €2.9 billion during Q3 2022, a 12% YoY change in constant currency compared to the previous year's quarter of €2.3 billion. On the other hand, Network Infrastructure sales are reported at €2.2 billion, a 5% YoY change in constant currency compared to Q3 2021's €1.9 billion.

Cloud and Networks Services (CNS) sales declined by 3% as the company worked to rebalance the portfolio but showed improving gross margin while Nokia Technologies sales declined by 19%, but continued to deliver good progress in its patent licensing growth areas such as automotive and consumer electronics.

It is worth noting that CNS helps in unlocking network value for communication service providers (CSPs) and enterprises by navigating through the major industry transition towards 5G networks and cloud-native software.

Another huge contributor to the spotlight is the Enterprise net sales growth, which accelerated to 22% in constant currency. "With this momentum, we expect Enterprise to remain our fastest growing customer segment," stated Pekka Lundmark, president and CEO.

In Q3 alone, Nokia added 73 Enterprise customers to its growing customer base. Demonstrating a stronger sales growth in this customer segment is a testimony to what Chris Johnson, Nokia's SVP of global enterprise business, previously expressed to Telecom Review: "Nokia Enterprise is a very strategic part of Nokia's growth story.",

CSPs, covering 81% of Nokia's customers, remain the biggest served market of the leading telecom vendor. As of October 2022, Nokia supports 83 live 5G networks.

Nokia Develops Enhanced Company-Wide ESG Strategy

Nokia announced an enhanced Environmental, Social and Governance (ESG) strategy, integrated into its business and technology strategies and focused on the areas where it can have the most significant impact.

Sustainability is core to Nokia's purpose of creating technology that helps the world act together. Building on years of robust sustainability programs and practices, Nokia has spent the past twelve months developing an enhanced company-wide ESG strategy to ensure that sustainability is a fundamental part of how Nokia develops technology and makes business decisions.

The ESG strategy builds on five strategic focus areas where Nokia looks to differentiate and create tangible environmental and social benefits: environment — focusing on both climate and circularity; industrial digitalization; security & privacy; bridging the digital divide; and responsible business.

Within the environment focus area, Nokia aims to be the leader in energy efficiency by building on its silicon, software and systems, further leveraging opportunities to optimize across the network with energy orchestration and green operations. Nokia is already working to improve energy efficiency in 5G-Advanced and 6G through early engagement in standardization and ecosystem development. Regarding circularity, Nokia focuses on hardware circularity — using recycled materials in its own products as well as refurbishing and recycling products when removed from customers' networks.

In Industrial Digitalization, Nokia provides connectivity and digital solutions that sustainably transform physical industries, making them more sustainable, safe and productive. To achieve this, we focus on the "Green Digital" proposition in our Enterprise portfolio.

In security and privacy, Nokia is working to ensure a common security baseline for products and services and is accelerating its security offering. Here, product development follows the "Design for Security" methodology, building security into the life cycle from the very start. Nokia's security experts partner with our customers to not only build and maintain secure networks — remaining compliant with national regulations for critical telecom infrastructure — but also assess the security resilience of networks against real attack scenarios and incursions.

Nokia aims to bridge the digital divide with its broad product portfolio, maintaining focused strategies with non-terrestrial network operators and digital skills-building solutions.

CommScope Q3 2022: Highest Performance on Record Since ARRIS Acquisition

CommScope revealed that their core net sales in the third quarter of 2022 increased by 17.7% year-over-year to $1.99 billion, primarily due to higher net sales in the Connectivity and Cable Solutions (CCS), Networking, Intelligent Cellular and Security Solutions (NICS) and Outdoor Wireless Networks (OWN) segments.

"I am pleased to share that we delivered Core net sales of $1.99 billion and Core adjusted EBITDA of $353 million for the third quarter of 2022 — our highest performance on record since completing the ARRIS acquisition. As we have continued to reiterate over the last several quarters, we are taking swift action to drive growth in our business and offset inflationary impacts. Our third-quarter results, namely turning our NICS segment profitable in the quarter, are a testament to our execution. While supply chain challenges remain and there is broader macroeconomic uncertainty, we maintain our expectation to deliver Core adjusted EBITDA for the full year 2022 within the previously provided range of $1.15–$1.25 billion," said Chuck Treadway, President and Chief Executive Officer.

Net income of $22.9 million, or $0.04 per share, in the third quarter of 2022, also improved compared to the prior-year period's net loss of $124.2 million, or $0.68 per share.

Treadway added, "Our CommScope NEXT transformation continues its strong progression in driving organic growth and efficiency opportunities throughout the Core company. Our teams have executed well in ramping capacity, and our general manager model is enabling greater visibility and flexibility in how we manage our business. As we drive all of these initiatives forward, we believe CommScope is well-positioned to deliver on our targets and create significant incremental shareholder value."

Breaking down the segments, CCS amounted to net sales of $1.008 billion, an increase of 27.9% from the prior-year period, driven by growth in Network Cable and Connectivity.

Moreover, NICS garnered net sales of $257.9 million, surging by 24.5% from the prior-year period, driven by growth in Ruckus Networks.
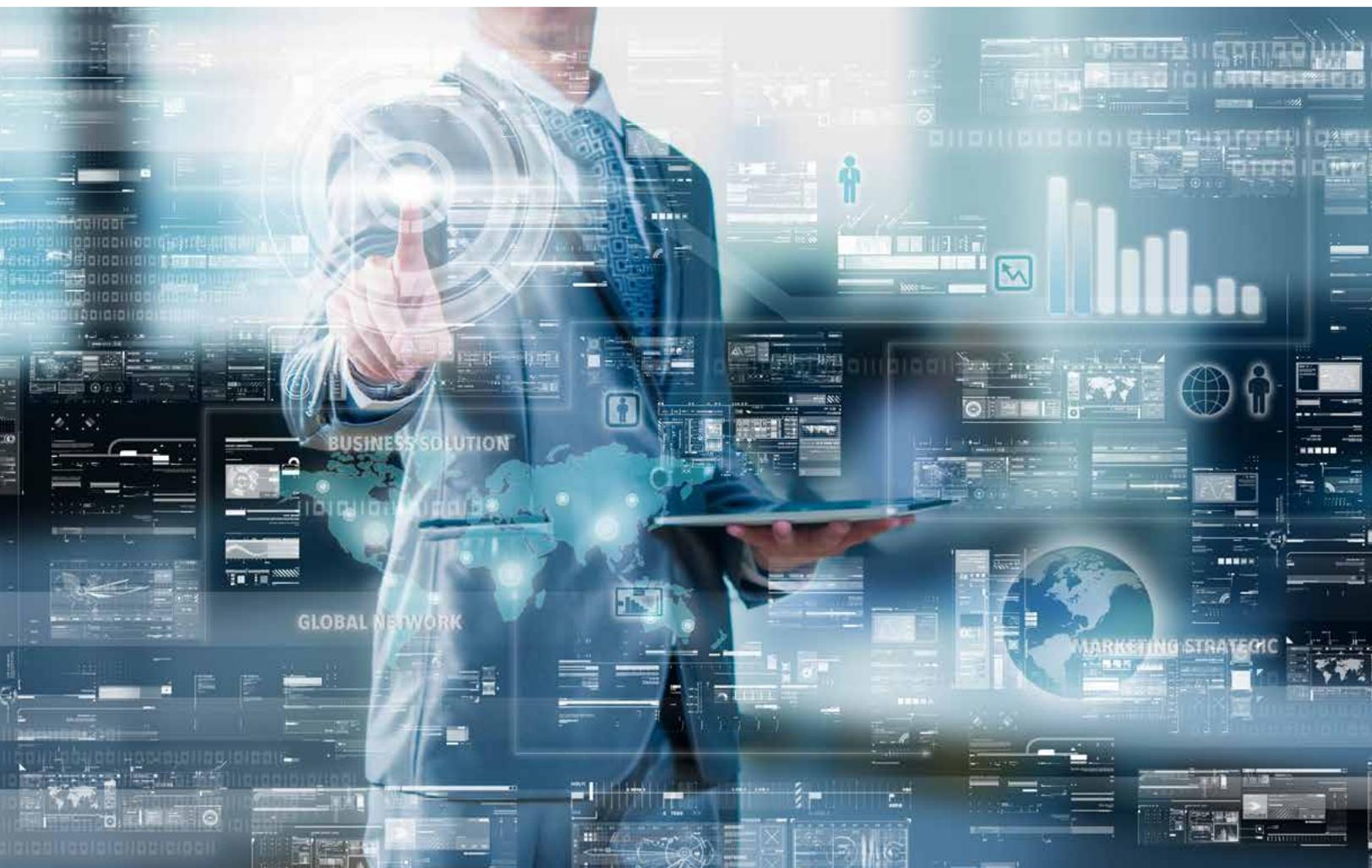
The Future of Data Management For Telcos

By now, we are used to seeing recommendations and suggestions for products or services pop up on our phone screens and emails sent by companies tracking our digital footprint. Many companies have been successful in fine-tuning their data monetization strategies and catching their customers' fancy by sending out timely service offers and greatly enhancing the user experience.

Known by the name "big data," the structured, semi-structured and mostly unstructured bytes of information found on organizational systems have proven to be extremely useful in formulating profitable propositions through business intelligence, predicting potential opportunities and establishing better engagement with customers. However, not every company has the capacity to handle their data well and convert them into the proverbial "milking cow."

The global data monetization market was pegged at $2.78 billion in 2021, and it is expected to reach $10.9 billion by 2028, at a CAGR of 21.54% over the forecast period (2022-2028), according to recent market findings.

Despite the benefits of data monetization, a vast number of organizations are struggling to streamline the volume of data available in their systems; hence, the need for organizing and repurposing untapped data is of paramount importance for enterprises.

Managing Unstructured Data

Data management incorporates gathering, organizing, safeguarding and storing data to analyze it to provide business intelligence for better and more precise decision-making. As such, data management solutions enable the availability of data right through the processes of cataloging, search and governance, allowing businesses to make the most of their data assets.

For instance, as a cloud-based model, AWS provides data management and analytics solutions for the financial services industry (FSI). Amazon FinSpace is a managed service for financial analysts at FSI companies that allows them to store, catalog and prepare financial data at scale. It facilitates running analysis on-demand across all accessible data, including internal sources such as order management systems, portfolio

management systems and third-party data like job statistics and earnings reports.

Looking Ahead

Future data management must allow businesses to foster data-driven business outcomes to accelerate customer centricity, leverage AI-powered analytics and automation to innovate faster, and build on quality service.

In the case of telecom companies, retaining customer information is crucial for managing churn as well as complying with data retention and privacy regulations. Volumes of data generated through signup, call logs, billings etc., require an efficient database management system (DBMS) that can enable real-time storage and processing of petabytes of structured and unstructured data while fulfilling compliance requirements.

Dr. Peter Zhou, president of Huawei IT Product Line, notes three data storage challenges facing telco transformation.

- Poor data mobility between storage systems due to resource silos, resulting in data value underutilization
- Mismanagement of complex O&M operations
- Intricate cloud convergence because of cloud silos

As such, last year, Huawei launched the OneStorage Solution designed to help telcos prepare for a futuristic data storage network that supports diversified service innovation. The solution provides a converged storage resource pool for various services and intelligent data management that is highly automated. It also uses an open architecture to bridge the silos in an increasingly multi-cloud era, helping telcos transform and innovate efficiently. The solution delivers a unified data storage resource pool for on-demand storage, intelligent data management using the Data Management Engine (DME) and multi-cloud convergence for efficient data management.

Moreover, as new technologies to extract additional value from data develop, the opportunities for enhanced analytics and data-driven, AI-powered decision-making will continue to grow. To enable telecom network operations to automate and monetize data assets, Ericsson came up with its Cloud Unified Data Management (UDM), Policy and Exposure portfolio solutions for data storage management, subscription management, policy control and core network exposure in 2G/3G, 4G and 5G networks to foster distinctive communication services.

Protecting and Monetizing Data

Telecom companies need to seek profitability in big data through optimization of network usage and services, enhancing customer experience, improving security and opening up to new opportunities. However, at the same time, efficient data management is also a key defense against the risk of ransomware, data theft, threat detection and rapid data recovery in times of critical data asset loss. Recent news of data breaches of telecom companies such as Optus is a red flag for data theft. Optus has stated that at least 150,000 passports and 50,000 Medicare numbers were stolen as a result. Hence, investing in data management solutions that incorporate stringent security systems and processes, faster data preparation, competent data scientists, robust data compliance and scalable data infrastructure should be a priority for telcos aspiring to derive value from data as well as secure customer information.

Importantly, telcos need to work closely with the regulatory authorities to ensure that the policies on data security and data governance are as watertight as they can get. Along with the acceleration of digital transformation touching every industry's verticals, especially with the adoption of the internet of things (IoT), edge computing and migration to the cloud, telcos cannot afford to be complacent about the safety and value of their ever-growing data volumes. **TR**

ZTE Posts 9-month Revenue and Net Profit Gains

For the nine months that ended on September 30, 2022, ZTE achieved operating revenue of RMB 92.56 billion, an increase of 10.4% as compared with the same period last year. During the period, net profit attributable to holders of ordinary shares of the listed company reached RMB 6.82 billion, an increase of 16.5%, and net profit after extraordinary items attributable to holders of ordinary shares of the listed company amounted to RMB 5.55 billion, representing a year-on-year increase of 55.3%. The basic earnings per share were RMB 1.44.

Despite the challenges of the complex external environment, ZTE posted steady progress in the first three quarters by collaborating with industry partners and furthering its position as a "driver of the digital economy." During the period, the company strengthened its key technology and product competitiveness, with R&D expense reaching RMB 16.11 billion, 17.4% of 9-month operating revenue.

During the period, while solidifying its position with innovative initiatives, ZTE built its comprehensive DICT product series and solutions in three dimensions: an efficient digital infrastructure of "connection and computing power;" flexible and agile digital capabilities; and application innovation of APPs services.

With the wave of global digitalization and low-carbon development, ZTE achieved year-on-year growth with its operating revenue in both domestic and international markets and in the three major businesses (carriers' networks, government and enterprise, and consumer business) as well.

G42 and Benya Technologies Partner in Egypt to Deliver Critical Technology Infrastructure

G42, the leading UAE-based AI and cloud computing technology company, announced a strategic equity-based partnership with Benya Technologies, the leading digital and ICT infrastructure provider in Egypt and the MEA Region, to deliver AI and critical telecom infrastructure in Egypt.

Benya Technologies is a key enabler of digital transformation and infrastructure in the Egyptian market, bringing sound experience in system integration and data centers. Through the partnership, G42 aims to provide the capital and technologies needed to develop Egypt's digital sector further, delivering artificial intelligence and critical digital infrastructure, such as data centers, telecommunications towers and cloud technology. G42's investment in Benya Technologies illustrates the company's commitment to Egypt as a strategic market for growth and an entry point to the broader MEA region.

The partnership was signed during GITEX GLOBAL in Dubai, at the G42 stand, by Mansoor Al Mansoori, G42 group chief operating officer, and Ahmed Mekky, chairman, founder and CEO of Benya Technologies. As part of the agreement, G42 will have a seat on Benya's Board of Directors.

Mansoor Al Mansoori said, "As a board member and strategic investor, G42 will collaborate with Benya Technologies to usher in the next era of digital growth for Egypt and the North African region. Both G42 and Benya Technologies have been working tirelessly to deliver digital transformation solutions and AI-powered infrastructure in our respective home markets, so the synergy and excitement to work towards our shared goals feels natural. We look forward to working with Benya Technologies to strengthen the technology sector throughout the country and the wider region."

Canada Insists on Competition, Rejects Telcos Merger

Industry Minister Francois-Philippe Champagne formally rejected part of a deal between Canadian telecom giants Rogers and Shaw to merge, insisting on the need for competition in the wireless market.

The two companies announced the CA$26 billion (US$19 billion) tie-up in March but faced pushback as it would arguably lead to less choice for consumers and higher cellphone bills.

"Earlier this year, I stated that I would under no circumstances permit the wholesale transfer of wireless spectrum licenses from Shaw to Rogers," Champagne told a news conference. "Today, I officially denied that request," he said.

Anticipating the decision — and in order to address the concerns — Rogers had already proposed the alternative of selling Shaw's Freedom Mobile subsidiary to Quebec-based Videotron.

That, too, would require Champagne's approval and he laid out two conditions: Videotron must keep the acquired wireless licenses for at least 10 years and offer prices now available in Quebec and 20% lower on average than the rest of Canada to subscribers nationwide.

According to the OECD, internet and mobile telephone services in Canada are among the most expensive in the industrialized world.

Red2Med Marks One of Egypt's Milestones in International Submarine Cables

The Minister of Communications and Information Technology, Amr Talaat, inaugurated "Red2Med," a new submarine cable of Telecom Egypt, accompanied by the Red Sea Governor, Amr Hanafi, and Adel Hamed, Telecom Egypt CEO and managing director.

Red2Med runs from Ras Ghareb landing point in the Red Sea to the landing station in Port Said in the Mediterranean Sea, through the Internet Corridor of Egypt (ICE), along the golden route of Morshedeen Road. The cable is the shortest, fastest and most secure way to transfer data between the East and the West. Red2Med is also a breakthrough in the cable routes from East to West and the connection between Africa, Europe and Asia. This project further enhances Egypt's standing as a global hub for data transmission and raises the efficiency of the international telecommunications infrastructure in Egypt.

Talaat listened to a detailed explanation from Telecom Egypt officials on the company's future strategic plans to expand its international network through international submarine cables to connect East and West. They highlighted the significance of the Red2Med submarine cable, which runs from the Red Sea through the Suez Canal to the Mediterranean. The ICT minister raised the Egyptian flag the moment the landing ship arrived at the Ras Ghareb coastline, celebrating the successful landing of Red2Med.

Talaat highlighted that the inauguration of Red2Med marks one of Egypt's milestones in international submarine cables. He added that the Ministry of Communications and Information Technology (MCIT) seeks to leverage Egypt's exceptional geographic location, a major strategic advantage for the country, as more than 90% of the data passing between East and West crosses the Egyptian lands.

Telecom Sector Contributes Nearly $75 Billion to Canada's Economy

Canada's telecom network operators played a vital role in maintaining economic and social activity in Canada, including investing more in expanding and enhancing critical network infrastructure than their international peers, according to a new report commissioned by the Canadian Wireless Telecommunications Association (CWTA).

Canada's telecommunications sector contributed $74.9 billion to the national GDP in 2021 and supported over 650,000 Canadian jobs. Canada's telcos outpaced international peers in capital investments in 2021, investing $21.2 billion in infrastructure and new spectrum licenses to support the country's 5G networks. Canadian operators' continued investments in network technologies have played a key role in the expansion of the country's digital economy, the report adds, and have the potential to contribute

an incremental $97 billion to Canada's GDP by 2035.

Canada's telecom sector's large investments are delivering positive outcomes for Canadians, including:

By 2020, there was 99.7% mobile wireless network coverage where Canadians live and conduct business as well as along major transportation roads; the sector is on track to deliver 100% coverage by 2026;

According to Opensignal, Canada's national operators ranked as Global High Performers for 5G Reach, with only South Korea, Taiwan and Saudi Arabia having as many network operators with as high a ranking;

Wireline internet access to 100 Mbps and 1 Gbps is available to 87% and 76% of homes, respectively, in Canada, compared to 76% and 51% of homes in EU countries;

Airtel Surpasses 1 Million 5G Users

Airtel has crossed the 1 million unique 5G user mark on its network. The company achieved this milestone in less than 30 days of its commercial launch, even as the network was being built.

Earlier this month, Airtel announced the advent of its 5G services in Delhi, Mumbai, Chennai, Bengaluru, Hyderabad, Siliguri, Nagpur and Varanasi. The services in these cities are getting rolled out in a phased manner as the company continues to construct its network and complete the rollout.

Randeep Sekhon, CTO, Bharti Airtel, said, "These are early days, but the response from customers has been very encouraging. Our network is being built every day, even as all 5G devices are now capable of working on the Airtel 5G Plus network barring a few exceptions, which should also be done in the coming weeks. We will continue to advance our network with a vision to connect the entire country."

Airtel initiated the 5G trials in 2021 and became the first operator to commercially launch 5G in the country. Customers with 5G smartphones can enjoy the high-speed Airtel 5G Plus on their existing data plans until the rollout is more widespread. There is no need to change the SIM, as the existing Airtel 4G SIM is 5G enabled.

Airtel 5G Plus has three compelling advantages for customers. First, it runs on a technology that has the widest acceptance in the world with the most developed ecosystem. This ensures that all 5G smartphones in India seamlessly work on the Airtel network.

Tech Giants Stagger Across Tough Economy, Place Long-Term Bets

"We're approaching 2023 with a focus on prioritization and efficiency that will help us navigate the current environment and emerge an even stronger company," said Meta chief Mark Zuckerberg.

Facebook's parent company, Meta, saw its profit more than halve to $4.4 billion in the third quarter from $9.2 billion a year earlier. Meta was set to lose about $78 billion in market value as shares sank 20%, trading at $97.94 at the time of writing, which is their lowest price since February 2016.

"While we continue to navigate some challenging dynamics — a volatile macro economy, increasing competition, ad signal loss and growing costs from our long-term investments — I have to say that our product trends look better," Zuckerberg told analysts on an earnings call.

Meanwhile, Google's parent company, Alphabet, also had quarterly earnings that fell short of market expectations. Aside from one period at the start of the COVID-19 pandemic, this marks the weakest revenue growth at Alphabet since 2014.

Alphabet and Google chief Sundar Pichai said on an earnings call that he sees this as a moment when "you take the time to optimize the company to make sure we are set up for the next decade of growth ahead.

Telstra Unveils New Government Security Capabilities

Telstra has announced enhancements to its specialist Security Operations Centres designed to deliver end-to-end security services for federal, state and local government customers.

Telstra operates a network of Security Operations Centres, across Canberra, Sydney and Melbourne, that have now been updated to allow operation at the ISM Protected level, a key requirement for many federal, state and local government agencies. The 24/7 ISM Protected security capability is delivered by Telstra's team of cyber experts with security clearance from the Australian government.

The enhancements will help deliver Telstra's sovereign security capabilities for Australian federal, state and local government customers and will also be offered to Australian critical infrastructure

organizations requiring higher levels of on-premise and cloud infrastructure, data and application security.

Telstra's security solutions, now enhanced for government, include cyber detection and response as well as Sovereign SecureEdge.

Telstra's cyber detection and response solution integrates with government systems, endpoints and cloud services to help monitor the vast landscape of cyber threats using big data analytics. It has recently been enhanced with new threat detection capabilities that leverage advanced machine learning to improve real-time detection, which helps alert government agencies to suspicious activity.

Sovereign SecureEdge is an advanced secure gateway capability, helping to protect users and applications against malware, ransomware and zero-day threats.

NTT Unveils New Data Center in South Africa

NTT Ltd., a leading IT infrastructure and services company, announced the opening of its latest data center in Johannesburg, South Africa. The Johannesburg 1 Data Center is part of NTT's expansion into the African continent and has a capacity of 12MW, covering 6,000m² of IT space once it is fully built out. The technical infrastructure is supported by N+1 uninterruptible power supply systems (UPS), N+1 generator backup and highly redundant cooling systems. This will provide clients with dedicated sustainable infrastructure, operational control and the design flexibility required to support their high-performance needs.

The facility will cater to hyperscalers and enterprises, providing them with an opportunity to use NTT's full ICT stack of services, including managed hybrid cloud, network management, collaboration, security and application monitoring.

Africa is experiencing a digital boom, with a population expected to double by 2050. Estimates show that 615 million users in sub-Saharan Africa will subscribe to mobile services by 2025, a 24% increase from 2020. This growth and reliance on technology is fueling digital transformation initiatives and demand for high-performing data center space. NTT is planning to accelerate its data center footprint in Johannesburg and other African cities to support this growth over the next several years.

The new facility uses a closed-loop chilled water system with air-cooled chillers, meaning that the water running through the cooling systems isn't evaporated. This reduces the threat of potential drought water restrictions and allows the data center to achieve low power usage effectiveness (PUE) and water usage effectiveness (WUE).
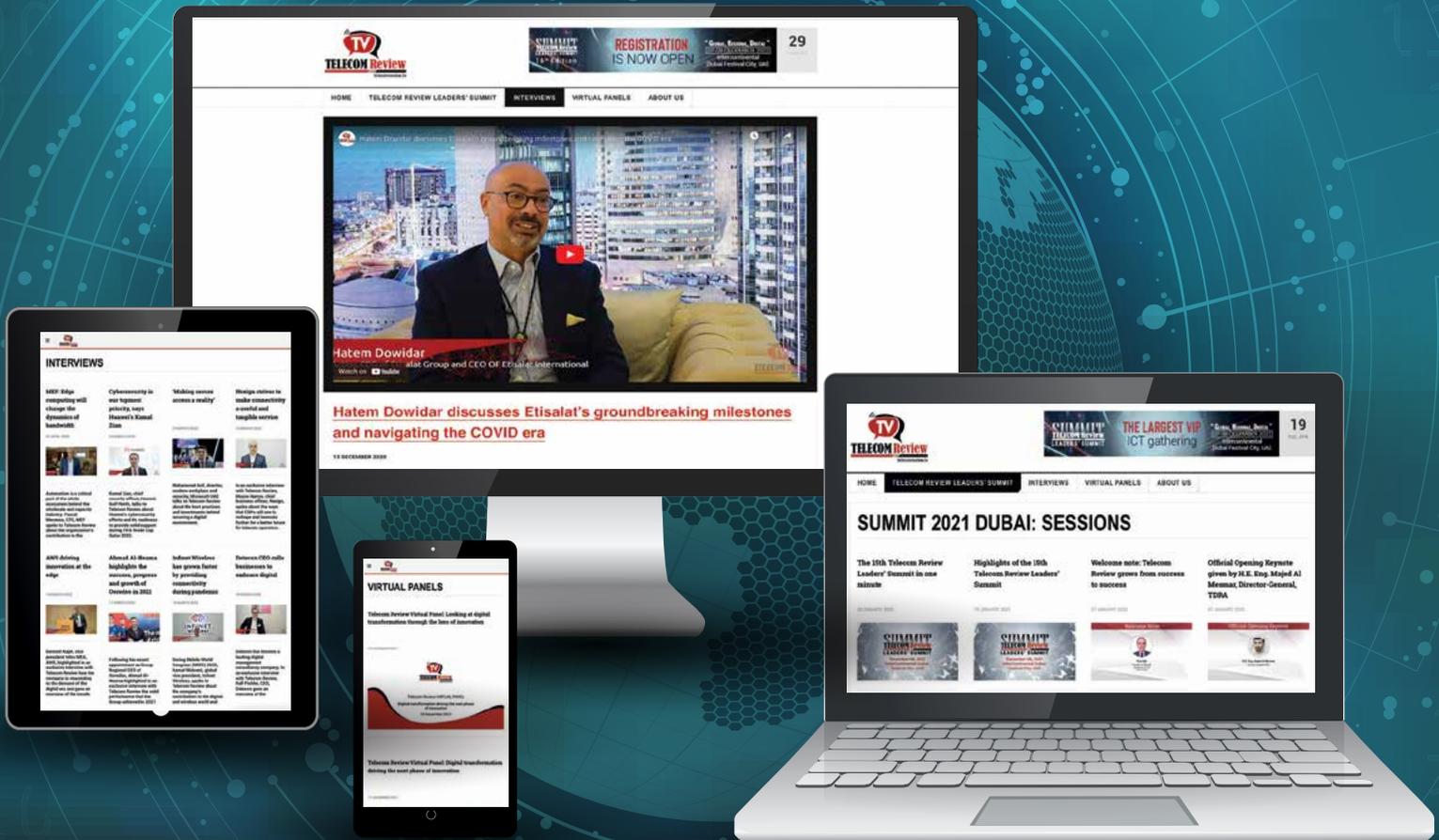
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