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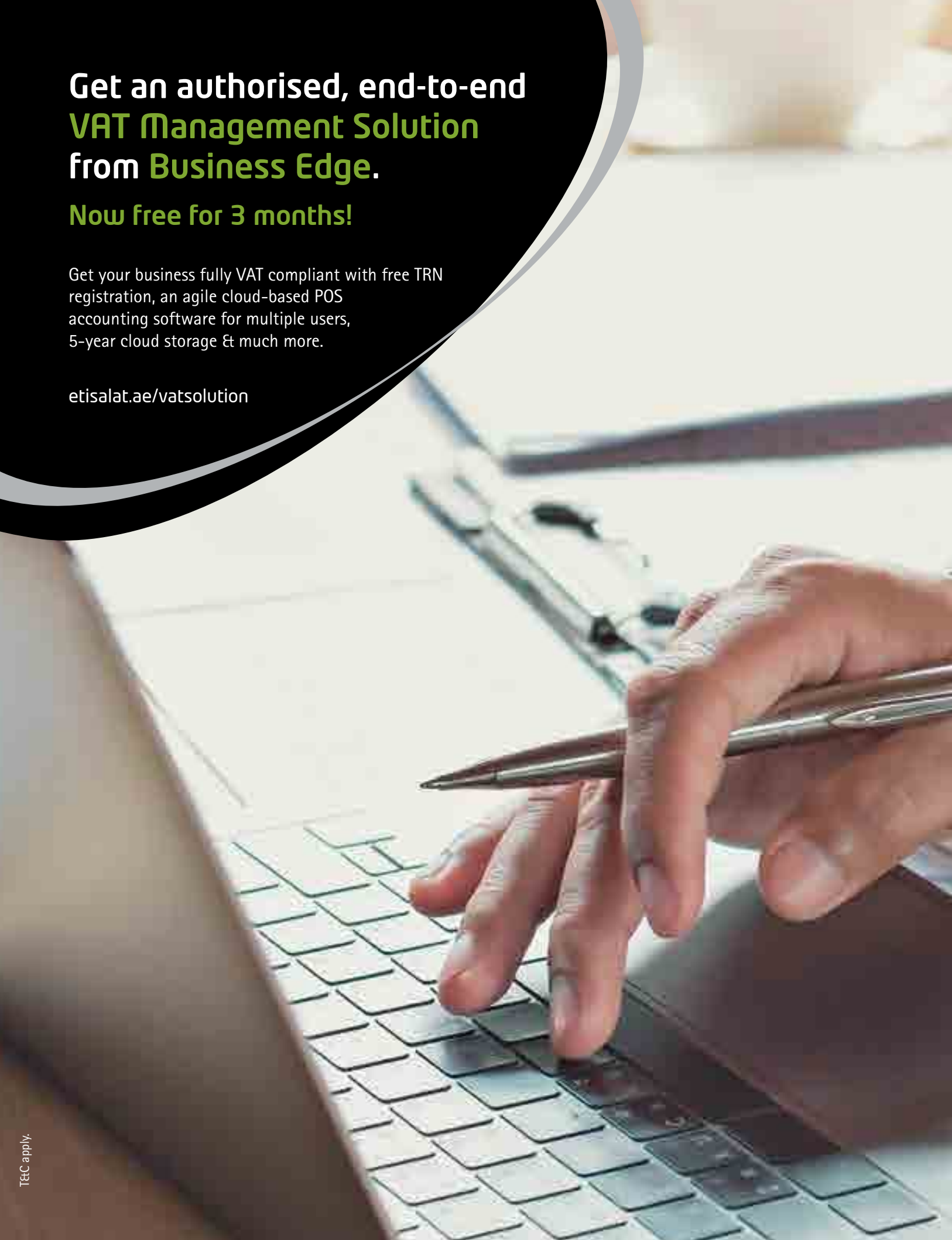
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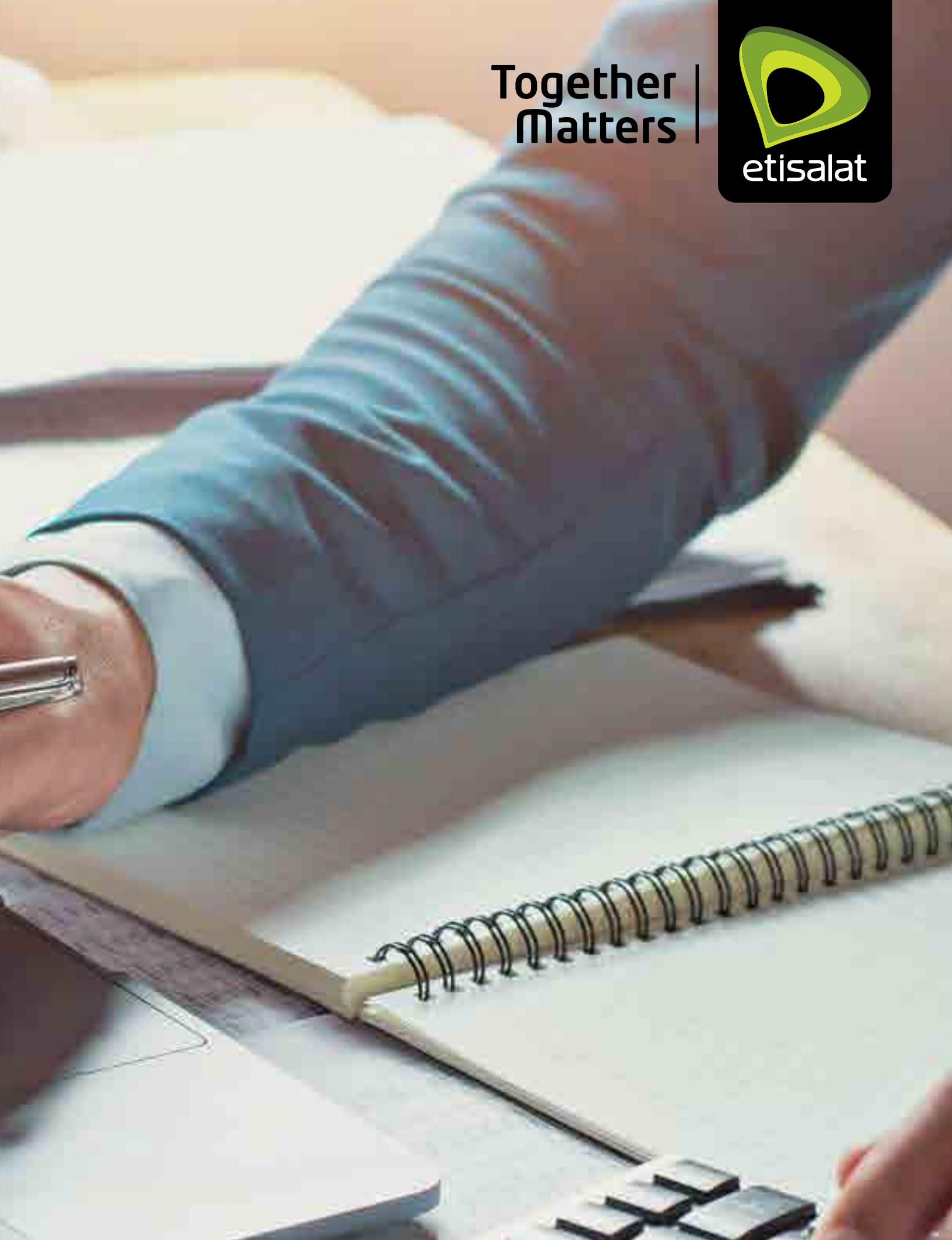
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■ Zain KSA committed to driving innovation for a sustainable future

■ Nokia's new generation of products helping customers cope with 5G capacity and demand

■ Etisalat transforms healthcare in UAE with digital innovation

■ Radio spectrum is a key enabler for UAE's digital economy

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Toni Eid,
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IPv6 and its importance in digital transformation

Following the success and positive impact of last year's edition, Telecom Review held a webinar earlier this month, entitled "IPv6 Enhanced Innovation: Paving the way for digital transformation in the Gulf region."

This year's edition focused on the national digital development and digital transformation in the Middle East and Gulf region. Industry experts from telecom operators, regulators, analysts and vendors participated as speakers to share their business experience and their expertise.

The challenge started years ago when IPv4 reached its full capacity, which was just 4 billion, while 7 billion devices need to be connected. So, IPv6 was very important to continue the expansion of connectivity.

With 5G, IoT and more devices to be connected, and with governments and enterprises shifting services to fully digital and with smart cities, even IPv6 was not enough.

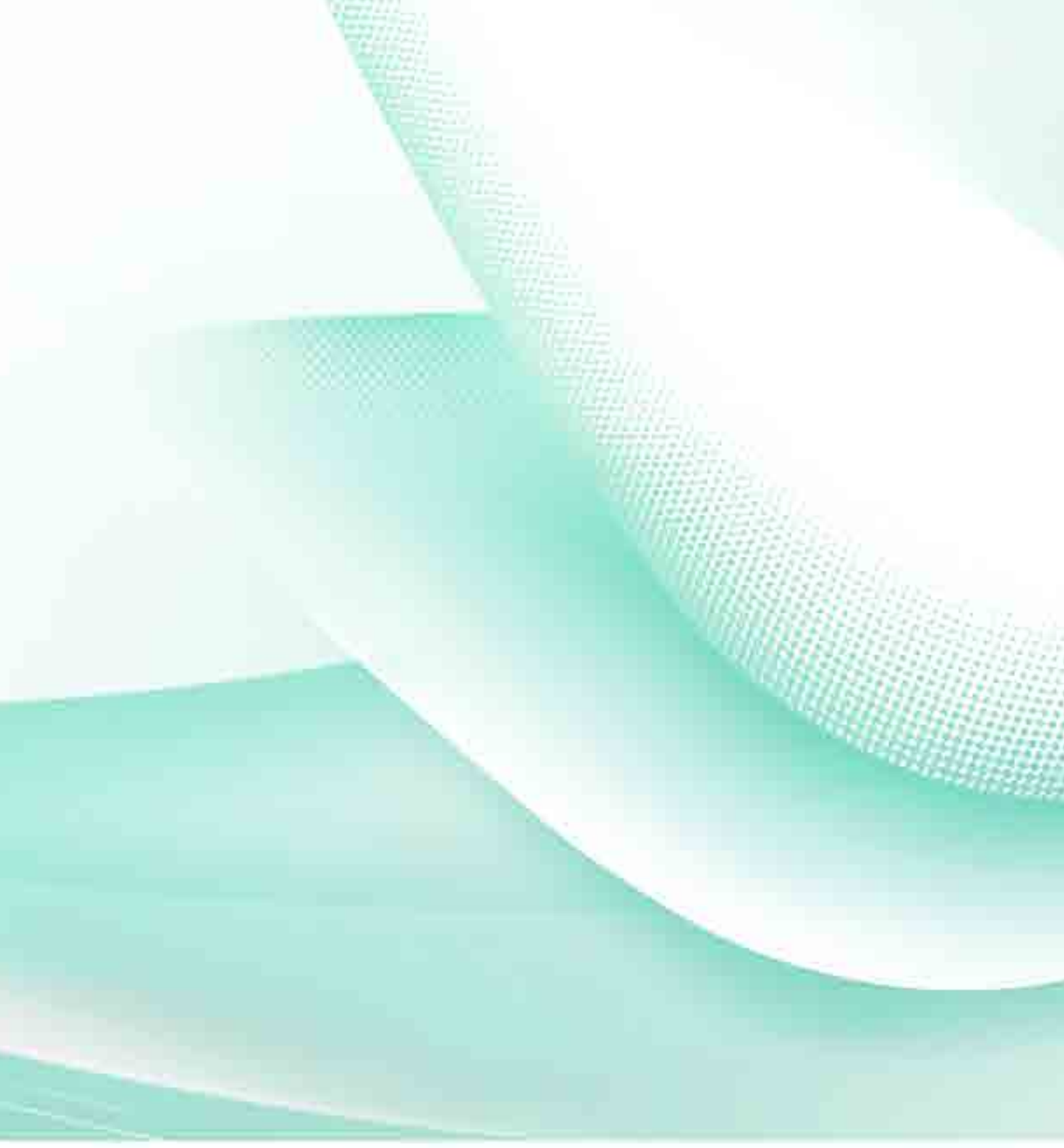
So, the need to move faster and invest in IPv6+ will lead the way to digital transformation as the pandemic pushed for a fully digital economy.

The IPv4 adoption will continue for years to come while IPv6 is using same basic technology with larger capacity and more flexibility to work on new networks with faster connectivity and more bandwidth.

Our commitment as Telecom Review Group to organize series of webinars rich in content and very insightful, with the best speakers of the industry and engage the whole ICT ecosystem, will persist for years to come.

Lighting up the Future

Building a Fully Connected, Intelligent World



HUAWEI

Eng. AbdulRahman bin Hamad AlMufadda, CTO, Zain KSA

Zain KSA committed to driving innovation for a sustainable future

Zain KSA has been a key player in the digitalization plan and vision of the Kingdom, through its countless achievements and initiatives. Telecom Review caught up with Eng. AbdulRahman bin Hamad AlMufadda, CTO, Zain KSA on the operator's contribution to the advancement of telecoms and how it is enabling the Kingdom-wide digital transformation in line with Saudi Vision 2030.

Zain KSA has been an avid contributor to the Kingdom's digitalization plan. Can you highlight the main achievements made in this framework?

At Zain KSA, we have succeeded in expanding and developing our operational performance across all levels through an elaborate innovation-based investment strategy and have been key contributors to boosting the Kingdom's positioning on the global ICT competitiveness map. Our possession of the largest 5G network in the Kingdom, the Middle East, Europe, and Africa and fourth globally, having deployed across 50 cities via 4,700 towers, has been a major milestone that attests to the validity of this approach.

In parallel, we paired our elaborate 5G network with a suite of corresponding solutions with multiple use cases across all industries. Our expansion strategy focused on IoT and utilizing big data. In addition to our AI-based scalable drone solutions, including micro-financing solutions through our FinTech arm 'Tamam'.

Digital entertainment has also been part of our development plans, where we launched our 5G cloud gaming platform GeForce Now exclusively in KSA, partnering with global cloud gaming service provider NVIDIA. Confirming our progress on this level, Zain KSA ranked first in CITC's Game Mode Q1 2021 report, recording top connectivity performance in four of the most popular video games in KSA, in addition to having the Kingdom's fastest average response time achieved by its 5G mobile network.

Through these rolling successes, Zain KSA positioned itself as a key contributor to the advancement of telecoms and data solutions and a main enabler of the Kingdom-wide digital transformation in line with Saudi Vision 2030. At the same time, our advanced ICT infrastructure has upped the Kingdom's capabilities in tackling the challenges arising in the wake of the pandemic that has yielded a more digital-dependent world.

Zain KSA ranked first in many international reports and global awards and recognitions in terms of delivering the best 5G services, where are you now in your 5G journey and what more do you aim to achieve?

At Zain KSA we are looking to create opportunities for multi-level growth by leveraging cutting-edge technologies in the ICT field. When it comes to our 5G journey, we pursue an all-inclusive approach to the technology as a way to achieve next generation connectivity for all, with direct impact on all aspects of life, from economy to business, healthcare, education, and entertainment.

Through this network, we successfully spearheaded innovation in the Kingdom and achieved the best 5G experience for consumers Kingdom-wide, demonstrating remarkable performance in several ICT indicators. As such Ookla's Speedtest awarded Zain KSA the Fastest Fixed Internet award in Saudi Arabia for the third consecutive time, more recently the first half of 2021. Earlier in the year, Opensignal announced in a recent report that we at Zain KSA won all three awards of the Saudi Arabia 5G User Experience report on "Best 5G Download Speed," "Best 5G Availability," and "Best Download Speed Experience - 5G Users." In parallel, we are proud to be improving Saudi Arabia's position as a smart global hub as we have been recognized for the "best 5G network and data performance in Riyadh" (according to a report by umlaut, the global network benchmarking leader) which has contributed to the capital having the fastest 5G among the capitals of the world, ahead of highly-connected hubs like Tokyo and Dublin.

> We successfully spearheaded innovation in the Kingdom and achieved the best 5G experience for consumers Kingdom-wide

Locally, the Meqyas report, issued by the Communications and Information Technology Commission (CITC), ranked Zain KSA first in 5G deployment across the regions and cities covered by the report in Q1 2021, recognizing the company as the best performing operator in the mobile 5G average download speed.

We plan to pursue further growth opportunities through maximizing investments in the vertical expansion of 5G use cases across several sectors, especially as this technology has become a vital lifeline for driving economic growth and achieving sustainability across all industries, mainly with the prevalence of IoT, AI, Cloud computing and Big Data.

Such investments would support us in reinforcing our position in the world of digital innovation and developing a number of B2C and B2B products in fields including FinTech, healthcare, digital entertainment, drones, among others. Throughout all these solutions we capitalize on the latest innovations to transform our customer experience. Simultaneously, we are seeking to expand our range of scalable solutions to businesses, mainly SMEs, aiming to enable a smart economy that would elevate the Kingdom's ranking as a global digital hub.

How is Zain upholding the Kingdom's Vision 2030 goals through its 5G technology?

With the Kingdom's ambitious Saudi Vision 2030 focusing on achieving economic growth and a better quality of life through revenue diversification and fostering innovation, a connectivity-driven transformation emerges as a critical element for wide-ranging resilience. Contributing to the ambitious national digital roadmap, Zain KSA is actively involved in enabling a sustainable, smart economy and maximizing value through investing in young talent and unlocking opportunities for the large-scale adoption of emerging technologies such as AI, Blockchain, Internet of Things (IoT), big data, and others to be used in e-government programs and private business digital transformation endeavors.

As a leading digital service provider empowering the Kingdom-wide digital transformation, Zain KSA has cemented its position, offering a wide array of innovative products and solutions that directly contribute to this goal. We are building strategic partnerships with leading investment enterprises and governmental entities in the Kingdom to enable the transition to the Fourth Industrial Revolution. These include the partnership with Neom Bay airport and the exclusive deal with the Red Sea Development company, as well as the MoU with the Saudi Authority for Industrial Cities and Technology Zones (MODON). Additionally, Zain KSA signed an agreement with the Makkah Region Development Authority to provide its telecom network at the Faisaliah

Project, a pioneering destination for smart services.

All in all, through our 5G and complementing range of next-generation technologies, we provide intelligent connectivity that would underpin a digital economy and a smart society with a better quality of life for everyone. As such, we are proud to have a key role in achieving Saudi Vision 2030's goal to transform Saudi Arabia into a globally competitive ICT hub, with modern technologies and an empowered knowledge-based society.

How do you evaluate Zain KSA's response to COVID-19? Do you consider that you were well prepared to face the ensuing challenges?

There is no business continuity playbook for how to operate during a global pandemic; not with government authorities, private corporations, or SMEs. The fact is no one was prepared. However, at Zain KSA we were quick to recognize the challenges, map out the response scenarios, and act. The pandemic has been an eye-opener to the unlimited potential of digitalization in sustaining a globally connected economy and society, and in promoting social inclusion.

We immediately activated the business continuity committee and restructured a fresh strategy to accommodate the emerging situation with the right amount of agility and resilience while still pursuing our planned 5G network expansion. Again, we were looking into the verticals we need to develop to continue to serve our customers, and we invested more in B2B business models, and tracked emerging business opportunities in the digital spectrum.

Our swift response proceeded throughout three phases: adapting to the existing situation, stabilizing operations while protecting the cash flow, and planning the rebound. Beyond that, we also introduced several humanitarian initiatives as part of our corporate sustainability, in line with the national collaborative efforts. These initiatives were implemented to support various sectors such as the educational sector through distance learning, the private sector by providing a well-connected, smart business environment, accommodating clients of SMEs as well as individuals, and supporting quarantined COVID cases, in addition to launching awareness initiatives.

So, did we anticipate a pandemic? Never. Did we rise up to the challenge? Absolutely.

What was the financial impact of the pandemic on Zain KSA? And what is your outlook for the remainder of the year?

Unlike its weighing effects on the bulk of businesses and industries, the pandemic had a completely different impact on the ICT industry, powered by emerging consumption patterns in line with the ensuing social and economic

> More recently, we revealed our Q2 2021 financial results where we maintained profitability for the 12th consecutive quarter with net profit of SAR 42 million and revenues of SAR 1,896 million

> We intend to further consolidate our presence in the economic and social aspects in order to contribute to a digital economy and knowledge-based society

disruption and migration to digital services. This rise in demand was also accompanied with an increase in costs incurred, which has affected the quality of services offered by many ICT providers world-wide.

At Zain KSA, thankfully, we were able to weather this impact as we successfully accommodated the surge in demand without compromising the quality of the services we provide, despite the increase in the cost of services provided. Beyond that, we have been recognized by several local and international organizations for the speed and quality of our 5G services, as I mentioned earlier. In 2020 we witnessed unprecedented data consumption growth. Take for instance our Q2-2020 data growth, it was 55% higher than Q2-2019, exceeding our forecast and above the regular quarter-to-quarter or YoY growth, but we managed to accommodate all that traffic which had coincided with our 5G network expansion.

Our financial performance continued to post good levels during the pandemic, despite the increase in the cost of services we provided. More recently, we revealed our Q2 2021 financial results where we maintained profitability for the 12th consecutive quarter with net profit of SAR 42 million and revenues of SAR 1,896 million. And for the first time in our history, our balance sheets posted retained earnings after having successfully extinguished all accumulated losses.

These successes have been a direct result of our capital restructuring strategy, that has helped transition us in Zain KSA to a new phase of growth underpinned by enhanced service quality that has defied all pandemic-related challenges. We will continue with our investment and innovation strategy over the coming period, and will continue to future-proof our operations to ensure a transformed customer experience on all levels and fulfill the company goals.

Do you believe that corporate sustainability should be an essential pillar in an operator's strategy?
Just as we invest to retain an elaborate digital infrastructure, we invest in our corporate sustainability to bring value to our offerings, while taking into consideration the environmental impact. Our four-pillared corporate sustainability goals address climate change, value-adding business, inclusion, and youth empowerment.

In this framework, Zain KSA has co-sponsored the National Olympiad for Scientific Creativity (Ibda'a) and partnered with "Mentor Saudi" to develop programs and initiatives that empower young Saudis and encourage them to pursue innovation to enhance their participation and maximize their impact in social work and human development endeavors.

At the same time, at Zain KSA we understand the magnitude of the redefined role of telecom players in a post-pandemic world where being connected has become synonymous to being socially and economically included. We intend to cherish this valuable opportunity to further consolidate our presence in the economic and social aspects in order to contribute to a digital economy and knowledge-based society.

In your opinion, what technological trends will drive the next phase in the telecoms and ICT industry?
From the Internet of Things, to big data, artificial intelligence, and Blockchain, the boundless potential of emerging technologies brings about transformational opportunities, scalable and applicable to virtually all sectors.

At Zain KSA we are preparing for the 5G SA (standalone), a full end-to-end network, which means connectivity is delivered vertically from the network grid to the user's device. Zain KSA 5G SA is set to bring a greater user experience. The technology also offers the '5G network slicing' feature which enables the customer to enjoy a scalable network depending on their connectivity needs and the devices they are powering.

In parallel, AI technologies are starting to gain a deeper and broader impact on industries as corporations of all sizes utilize it to harness their available resources to produce more with less. At Zain KSA we are utilizing AI and Big Data by piloting video analytics in shops. This camera will report a customer's journey at the store and give insight of the customer experience, including the waiting time and their facial expression to determine customer satisfactory index. It will also count the number of people visiting our flagships stores. All these insights will help optimize our sales and deliver an improved customer experience. The anticipated breakthrough in AI is deep learning, or using deep learning algorithms to train the model to the highest accuracy that would ultimately increase productivity and efficiency. This mimics the learning function of the human brain. The more the AI sees, the more intelligent it becomes. An example of deep learning AI are chatbots which are becoming increasingly useful in customer service.

The combination of AI with Big Data, fast computing, and hi-speed connectivity offered through 5G would bring about disruptive technology fueling the 4th industrial revolution. We will begin to see more autonomous cars, smart lighting, and smart cities with fully-automated infrastructure systems.

Another disruptive facet of innovation is Blockchain, which represents a constantly growing ledger that keeps a permanent record of all the transactions that have taken place, in a secure, chronological and immutable way. This technology is rapidly transforming a broad multitude of sectors and industries.

Upon gaining a deep understanding of all the elements of the Fourth Industrial Revolution, decision makers and business leaders can have a better grip on the knowledge and capabilities needed to attain a fully-conceived digital transformation. TR

Etisalat Digital's cloud-based platform adds edge to UAE healthcare system

Etisalat Digital announced its Cloud Electronic Medical Record, a ground-breaking solution for healthcare establishments to efficiently share data in real-time throughout the UAE as it moves towards a world-class healthcare system ensuring a longer, happier and healthier life for all citizens.

This is in line with the long-term goal of the UAE leadership and Vision 2021 to take healthcare to the next level, applying international standards to the infrastructure management of health facilities in the country. Etisalat Digital's solution will meet the government's mandate for a centralised medical record for 'Every citizen and resident'. In the near future, the solution aims to connect more than 3,000 UAE based public and private sector healthcare providers, with an aim to efficiently share data in real-time throughout the country.

The Cloud-based Electronic Medical Record (EMR) Platform being provisioned by Etisalat Digital, addresses some of the pertinent challenges that private independent healthcare practices may face in adopting an electronic patient record system. Etisalat's turnkey, fully managed, resilient and secure SD-WAN solution connects all the authorised clinics/pharmacies to a secure and central database.

Commenting on the launch, Salvador Anglada, group chief business officer, Etisalat, said, "Our ambition in healthcare has always been to enable digital transformation by introducing the right technologies that create sustainable operating models and help us move towards a value-based health system. This centralised healthcare solution will also help meet the strategic objectives of the government in building a world-class healthcare system in the country. Etisalat's new healthcare solution will leverage on its strength in advanced technologies such as Artificial Intelligence(AI), cloud computing, 5G and Internet of Things supporting the digital transformation of the health sector as well as key national health initiatives."

The Cloud EMR platform and associated services make it seamless for private practices to subscribe and start using the platform. In addition to keeping electronic records, the platform provides a host of digital tools that bring efficiencies to day-to-day operations and aide in practice management. Leveraging on cloud computing, the EMR platform is designed to scale quickly and serve hundreds of private practices in the near future.

UAE ranks 1st on mobile, top 20 in fixed broadband speeds globally

According to the latest data from Ookla, the UAE has ranked first in terms of mobile speed at 193.51 Mbps, and among the top 20 countries globally in the fixed broadband index. The fastest average download speed of 180 Mbps was recorded in May 2021.

From the January 2021 download speed average of 125 Mbps in the fixed broadband to 180 Mbps in May 2021, the massive increase was mainly due to the corporate programs and initiatives taken by Etisalat and du to boost UAE's fixed broadband ranking. In the Middle East and Africa (MEA) region, UAE was ranked first on the index. Additionally, UAE maintains an upward trajectory in terms of average mobile download speed, surging from 107.53 Mbps to 193.51 Mbps between June 2020 - June 2021.

"This global achievement is a testimony to UAE leadership's vision and commitment in bringing the country to the forefront taking a lead in the ICT sector while being the most advanced country in digital transformation. With the joint efforts of both operators we aim to bring the UAE among the top 10 globally in the Speedtest Global Index from Ookla," said Majed Sultan Al Mesmar, director-general of the Telecommunications and Digital Government Regulatory Authority (TDRA).

The high speeds on both the mobile and fixed broadband networks are prerequisites to delivering the best and most advanced telecom services in the UAE. "This will uplift the national performance, enabling the ICT aspirations of the leadership. I hereby thank telecom service providers in the UAE for their relentless efforts towards this achievement, which is part of UAE's preparations for the age of Fourth Industrial Revolution and the Artificial Intelligence," Al Mesmar added.

Etisalat and du have worked continuously in providing the best customer experience with the highest penetration of fiber-to-the-home (FTTH) connectivity in the world and modernizing their networks for increased network capacity while also boosting international data capacity.

Abu Dhabi proven to have one of the fastest 5G networks in the world

United Arab Emirates (UAE) capital Abu Dhabi has ranked among the fastest capitals globally in the 5G network index with the fastest median download speeds (421.26Mbps) in the first half of 2021. The ranking was provided by the latest data from Ookla®, a global leader in fixed broadband and mobile network testing applications, data and analysis.

This recent achievement is yet another feather in the UAE's cap as not only Abu Dhabi has emerged among the top three fastest 5G capitals in the world, but is also home to the fastest mobile network on earth on an overall basis.

Another noteworthy achievement recorded in the UAE was both Abu Dhabi (421.26Mbps) and Dubai (417.07 Mbps) median download speeds featuring in the special 'Global 5G Benchmark Report' that focused on major cities globally measuring 5G performance and availability in the first half of 2021.

This ranking is attributed to the long-term planning and investment of both operators in the rapid deployment of 5G sites and jointly working with regulatory authorities to assign the needed spectrum to cater for the demand of high capacity in cities. An end-to-end participation and preparation from both operators supported the early adoption of new technologies and enabled swifter customer experience enhancements as well as meeting requirements of international standards from the International Telecommunication Union (ITU)/ 3rd Generation Partnership Project (3GPP).

With vertical and horizontal city expansion in the UAE, high mobile indoor penetration enhancement enabled the deployment of in-building solutions and small cells for better mobile availability anytime, everywhere. The 5G network also made it possible to experience and access data heavy applications in the country. This transformed the telecom network to a state-of-the-art infrastructure, supporting emerging technologies such as IoT, cloud, big data, AI, robotics and AR/VR supporting transformation in a digitally disrupted and fully connected world.

Both operators Etisalat and du were continuously involved in focused studies on network readiness and handsets to provide a seamless customer experience.

Ookla® uses Speedtest Intelligence® data to see which world capitals have the best 5G speeds and availability, based on locations with commercially available 5G during Q1-Q2 2021.

CITC awards licenses to two new MVNOs in Saudi Arabia

The Kingdom of Saudi Arabia now has seven licensed mobile telecom companies after the Communications and Information Technology Commission (CITC) awarded licenses to two new mobile virtual network operators (MVNOs).

Integrated Telecom Mobile Company (ITC Mobile) and Future Networks Communications were granted licenses after winning a competition announced by CITC in February 2021. Back in 2014, Virgin Mobile KSA and Etihad Jawraa have also received MVNO licenses from the regulating body. The importance of having an MVNO license relates to the eligibility of a telco to provide users with voice calls, internet, SMS, voicemail, media services, and more, without owning any towers or frequencies.

Following the entry of two additional MVNOs in the market, Saudi Arabia's ICT sector continuously reflects a level of competitiveness. Thanks to its robust infrastructure, high user penetration, and clear strategy, the GCC country remains to have attractive advantages for both local and international investors.

During the licensing ceremony, H.E. Mohammed Al Tamimi, governor of CITC, said, "At CITC, we aim to enhance the level of competitiveness in the sector, and improve user experience, by facilitating additional service providers," he said. Al Tamimi also highlighted that telecom service providers are important partners in transforming the Kingdom into a digital society. Being a key component for achieving Vision 2030, they can contribute to the innovation of telecom, mobile data, and internet services.

From a general perspective, the Saudi telecommunications sector looks promising and is anticipated to contribute 5.3% to the national GDP. In 2020, its market size reached SAR 69 billion, capital investments of telecom service providers amounted to SAR 17.6 billion, and mobile telecom services penetration reached 135.5%.

UAE Central Bank set to launch digital currency by 2026

In line with its aim to be among the world's top 10 central banks, the UAE Central Bank (CBUAE) has set its priorities for 2023-2026, including the launch of a digital currency. According to CBUAE's statement, its strategy involves seven objectives to help drive the country's digital transformation ambitions, primarily focused on financial services. Moreover, they emphasized utilizing the latest artificial intelligence and big data solutions. While UAE's innovation strategy is aimed at streamlining inspection, monitoring, and insurance systems through technology, the government will involve the use of the UAE Pass to bolster financial inclusion and easy access to financial services. The UAE government also envision developing a secure cloud infrastructure for consistent innovation, to stay in line with its goal of global fintech disruption and the Green Economy initiative from Vision 2021.

While numerous GCC countries have previously expressed their readiness with regards to digital technologies, the UAE becomes the first regulator to announce interest with a fixed timeline. In retrospect, in 2019, Saudi Arabia and the UAE announced a test phase of a common cryptocurrency to be used for cross-border transactions.

Atos and Ooredoo enhance Qatar's cybersecurity services

Atos and Ooredoo deliver key cybersecurity threat detection and response services to Qatar Smart Program "TASMU" driven by the Ministry of Transport and Communication (MOTC) – ultimately supporting Qatar National Vision 2030. TASMU is the first smart city project in the Middle East and aims to improve the way of life of Qatari citizens, residents and visitors. Atos and Ooredoo's solution integrates cloud-native intelligent security analytics and next-generation Artificial Intelligence (AI) capability from the Atos Alsaac platform to secure TASMU's infrastructure and applications.

As Ooredoo's security partner in Qatar, Atos builds on its strong expertise in cybersecurity and leadership position in delivering capabilities for Smart Cities to help the Ministry and its ecosystem of partners that will provide smart city services to collect, orchestrate and secure data.

In particular, Atos will provide its Managed Detection and Response (MDR) service powered by its AIsaac platform for multi-vector threat detection, auto-containment and incident response orchestration. The MDR service will be delivered from state-of-the-art Atos Security Operations Center (SOC), ensuring strong data sovereignty for "TASMU." With Atos' solution, the Ministry of Transport and Communication will be able to protectively hunt, monitor, contain, and respond to threats 24/7, with the best industry-based security practices.

TASMU focuses on harnessing technology and innovation to drive a sustainable economic agenda while improving quality of life and enhancing the delivery of public services in Qatar across various top priority sectors, such as transportation, logistics, healthcare, sports and environmental. This effort is supported through a collaborative and thriving ICT ecosystem and global innovation network to co-create relevant technology solutions.

"TASMU showcases the integration of Atos AIsaac and cutting-edge partner technologies in cyber analytics for the first smart city project in the Middle-East region and brings advanced threat hunting, orchestration, and remediation capabilities to Qatar. This powerful combination has laid down strong foundations for Atos and Ooredoo's partnership and joint business in the region. It has also given us an edge over the competition to enable us to serve our customers better", explains Marc Veelenturf, Head of the Middle East and Head of Telecom, Media & Technology for Growing Markets, Atos.

Sheikh Nasser Bin Hamad Bin Nasser Al Thani, Chief Commercial Officer at Ooredoo, said, "We are proud to be working with Atos to play such a pivotal role in enabling the digital transformation of Qatar through TASMU. As a leading telecommunications operator, with innovation firmly at the heart of our strategy, we are committed to providing our knowledge and expertise to our country with the overall ambition to achieve the goals of Qatar National Vision 2030. We look forward to a long and mutually beneficial relationship with our esteemed partners."

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Petri Moilanen, mobile networks MEA director of sales, Nokia

Nokia's new generation of products helping customers cope with 5G capacity and demand

Following the launch of Nokia's latest generation of Airscale radio, massive MIMO antenna and baseband products, Petri Moilanen, mobile networks MEA director of sales, Nokia explained in an exclusive interview with Telecom Review about the recent products launch and the main differentiating features.

Nokia has recently launched a new generation of AirScale radio, massive MIMO antenna and baseband products. Can you give us a brief overview on the products and why did Nokia decide on launching them now?
After the initial launches of 5G around two years ago and as the technology and marketplace have begun to mature, there has been a need to enhance the network performance to fulfil the increasing demand for more capacity. Initially there was only a limited need to support more than 100 MHz bandwidth, but as more spectrum was made available, some operators have increased their in-band spectrum assets and new requirements have emerged. Operators must keep their solution efficient, so it's essential to have a single antenna that can support sufficient bandwidth and avoid the need to add another one to cover the new spectrum allocation.

Also, what we have witnessed with some of our own Nokia 5G references is that operators are looking to lower the costs of their market entry, through the adoption of RAN sharing, which also drives the need for a single antenna to support wider bandwidth while reducing the amount of equipment deployed, the costs of network rollout and the operation cost.

At the time the first 5G networks started to become commercial (April 2019), component and technology limitations made the design of practicable wideband radio platforms a challenge. For example, the RF power amplifier technology necessary to support the wide RF bandwidth [of say band n78, 3.4 GHz to 3.8 GHz) and performance to comply with 3GPP specifications was not possible. Similarly, with the introduction of 5G came the use of new spectrum bands. These are at higher frequencies and much wider RF bandwidths than previously used by mobile networks.

Hence, in order to help our customers cope with all this increasing 5G capacity, spectrum demand and deployment options, we have launched a new generation of AirScale Massive MIMO antennas and remote radio heads, as well as a new generation of AirScale baseband plug-in cards. And we expanded the single RAN capability to include 5G based on the new products. All of these are powered by the latest Nokia ReefShark SoC technology.

What value will the new generation of AirScale products for 5G deliver to telecom operators across the Middle East and Africa market?

The new AirScale solutions help mobile operators scale up their network capacity for 5G (and 2G, 3G, 4G) – flexibly, efficiently and at a reduced TCO. All new products are enabled by ReefShark SoCs (System on Chip) of the latest generation. The products were designed to support higher capacity and scalability, wider spectrum and shared infrastructure while lowering energy consumption.

Nokia launched the world's lightest massive MIMO antenna, weighing just 17kg, without compromising on bandwidth or RF output power. And we don't sacrifice performance for weight. In fact, our new 17kg light AirScale massive MIMO antenna supports 400 MHz RF bandwidth (400 MHz IBW and 200 MHz OBW) necessary to support the highly popular 3GPP frequency band n78 (3.4GHz to 3.8GHz), with up to 240W RF output power.

In addition, we also launched our new AirScale baseband card which is the world's most integrated 5G and Single RAN baseband, up to 8-times the capacity and number of cells of the previous generation and can reduce power consumption by up to 75%.

The common Single-RAN software for 2G, 3G, 4G and 5G cuts RAN TCO significantly, it also supports multimode, multiband and eCPRI/ CPRI fronthaul on a single baseband platform.

Early analysis pointed to TCO reductions of about 30%, thanks to common operability, common software delivery, common transport and an increased level of hardware sharing.

One of the most important features of the 32TRX and 64TRX massive MIMO offerings is weight. Why is weight so important?

Weight affects the ease and cost of network deployment. From an operator perspective it is a major consideration. Operators aim to roll out their 5G networks, indeed all networks, as efficiently and as quickly as possible. Doing this requires solutions that offer deployment flexibility, that's to say how an antenna or radio can be mounted, as well as the ease of the deployment itself. Understandably, a solution that can readily be installed by one person rather than a team of people, or worse still one that requires a crane to install it, is highly desirable, as it reduces resources, the efforts required and ultimately the cost.

Moreover, the weight directly affects the load on the mast/tower that must be maintained within the design limits of the supporting structure. If the limits are approached or exceeded, it will be necessary to either strengthen or replace the structure – a time consuming, costly, and disruptive exercise that must be avoided whenever possible.

Can you update us on progress with ReefShark? When will all configurations rely fully on ReefShark SoCs?

Custom silicon has an essential role in our strategy and expanding the use of our ReefShark custom silicon improves base station capacity and connectivity and reduces the product cost and power consumption. We have optimized the design and processing functions in the SoCs. Nokia's own IP (Intellectual Property) blocks make ReefShark SoCs unique. We work with leading SoC houses to ensure use of latest silicon technology. We have tripled our R&D workforce in ReefShark SoC development and continue hiring.

In Q3 2020, 37% of 5G shipments were powered by ReefShark. We continue to track well against our targets: 43% by year end 2020 (beating the target of 35%) and approximately 70% by end of 2021. In 2022, the transition will be complete. And we have already the next generation SoC's in the works, in addition to the ones we have already. TR

The new AirScale solutions help mobile operators scale up their network capacity for 5G (and 2G, 3G, 4G) – flexibly, efficiently and at a reduced TCO

Etisalat transforms healthcare in UAE with digital innovation

Etisalat Digital's (business unit of Etisalat) unified patient experience value proposition transforms patient care through a combination of innovative technologies.

A positive patient experience matters more than ever, according to healthcare industry leaders worldwide. In an annual survey by Omnia Health Insights in partnership with GRS Research & Strategy, nearly half (45%) of respondents in clinics, private hospitals and public hospitals across the globe identified understanding patient needs as the single most important aspect in ensuring a satisfactory patient experience in 2021 – a 15% increase from the year before.

The Voice of the Healthcare Industry Market Outlook 2021 found integrated health services (19%) in second place, ahead of access to new and improved technologies (13%).

Survey participants also saw transparency, convenience, wait times and clinical atmosphere as priorities conducive to creating a satisfactory patient experience. All these span different stages of the patient journey whereupon the patient interacts with the healthcare delivery system.

A satisfactory patient experience will, for example, result from a timely appointment, ease of access to information, and effective communication between patient and healthcare provider.

Alongside clinical outcomes and interventions, Etisalat Digital's healthcare division sees enhancing patient experience as necessary to building a patient-centric healthcare model.

Etisalat Digital aims to improve the patient experience through its unified patient experience solution whilst generating operational efficiencies and cost savings for the healthcare provider.

Addressing every stage of the patient journey

Digitizing the patient flow begins with a comprehensive exercise to intimately understand the patient journey, which involves mapping interactions or "touch points" between patient and provider.

By identifying specific bottlenecks, Etisalat Digital is better able to design appropriate technology-led solutions tailored to the provider. Inclusivity is also taken into account, recognizing that not all patients are digitally-savvy.

Take Patient A (we will call him Fahad). Fahad's patient journey begins at home. Over breakfast while preparing himself coffee, Fahad receives a reminder from his hospital mobile app, about an upcoming appointment the same afternoon with his diabetologist. This mobile app which is integrated with several of the hospital systems, empowers him to easily access various hospital services, book new appointments including telehealth, and also interact with the provider. While getting ready for his appointment, Fahad receives another notification from the hospital app alerting him to leave in the next 35 minutes if he were to make it on time given the anticipated traffic on his route. Just as he is about to set out, a ride share option pops-up on his hospital app. Instead, Fahad chooses to drive himself. Navigation through maps helps him take the fastest route.

Upon arrival at the hospital, he finds a parking space with ease thanks to the smart parking feature that has identified and reserved an available slot near the

outpatient clinic, saving him time and effort, especially in the searing heat. He opts to go without a digital valet service, available for certain cases such as a physical disability that would send a porter to the door ready to receive the patient.

As Fahad enters the building, grateful to be in the cool environment, a self-service kiosk allows him to automatically check in through facial recognition and an Emirates ID reader (similar to checking in for a flight at the airport), meaning he doesn't have to queue. While at the kiosk, he quickly updates his profile with his new email address and makes a quick payment.

While at the diabetes clinic, he receives an estimated wait time on his mobile app since the queue management process is also handled digitally. Upon seeing the consultant, he is advised for a blood test, an ultrasound, and given a prescription.

Fahad turns to his mobile app again for guidance. Using indoor navigation, the app directs him to the precise location, first to the ultrasound, since there is little wait time as determined by the intelligent system, before taking him to the lab. Meanwhile, he is notified by the app that his prescription is ready for collection from the pharmacy, saving him more time.

A day later, Fahad receives his test results through the hospital app and is able to discuss results with his doctor via video-consultation feature.

He is furthermore reassured that his medical data is safe: Etisalat Digital takes security very seriously. All data through the application is end-to-end encrypted, including in transit, while Etisalat Digital's solutions are hosted securely on its own cloud platforms and data centers within UAE.

Improving outcomes with cloud-based solutions

Effectiveness, patient safety and people centricity are key elements of quality of care. Globally, health systems have been trying to meet quality expectations by introducing transformation that makes care more integrated, participatory, and personalized. Some of the challenges

in rapid transformation were made apparent by COVID-19, where Etisalat saw digital technologies come to the rescue. However, significant work still lies ahead, and are glad that this conversation has taken center stage like never before.

Etisalat Digital is playing an increasingly important role in realizing health sector transformation using technology enablers creating value in both public and private sector. Most recently, the roll out of the new cloud based digital platform, an Electronic Medical Record (EMR) system, addresses critical barriers faced by medical practitioners and clinics in the private sector to transition from paper based to electronic record keeping.

Etisalat Digital's Cloud-EMR, a part of a suite of solutions called Business Edge for Healthcare, provides essential digital tools for health practitioners to manage their day-to-day workflow. In addition to patient record keeping, it includes tools for patient scheduling and appointment management, placing laboratory and pharmacy orders, billing, and electronic claims. Necessary regulatory and security compliances, such as two-layer authentication, role and privilege-based access, and localized code catalogues specific to each Emirate are also built-in.

The capabilities to support modern interoperability standards such as HL7, FHIR and CDA allow the EMR platform to integrate with Health Information Exchange systems of different Emirates and communicate data in real-time to improve patient outcomes. It is not about providing a software system but build necessary services around it making adoption easier so that healthcare providers don't have to think about maintenance and can focus on managing their practice and providing best possible care to their patients.

Etisalat Digital's vision behind the Cloud-EMR platform is twofold: firstly, to support government initiatives like Malaffi (Abu Dhabi Health Information Exchange) and NABIDH (Network and Analysis Backbone for Integrated Dubai Health) with connecting healthcare providers and creating a truly unified database of patient records; secondly to enable digital transformation of medical practices, helping them find cost efficiencies in day-to-day operations and elevating the quality of care to their patients. TR

> “Etisalat's latest solutions are transforming healthcare in the UAE with advanced technologies and its new digital healthcare vertical has created value propositions”

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Green Energy

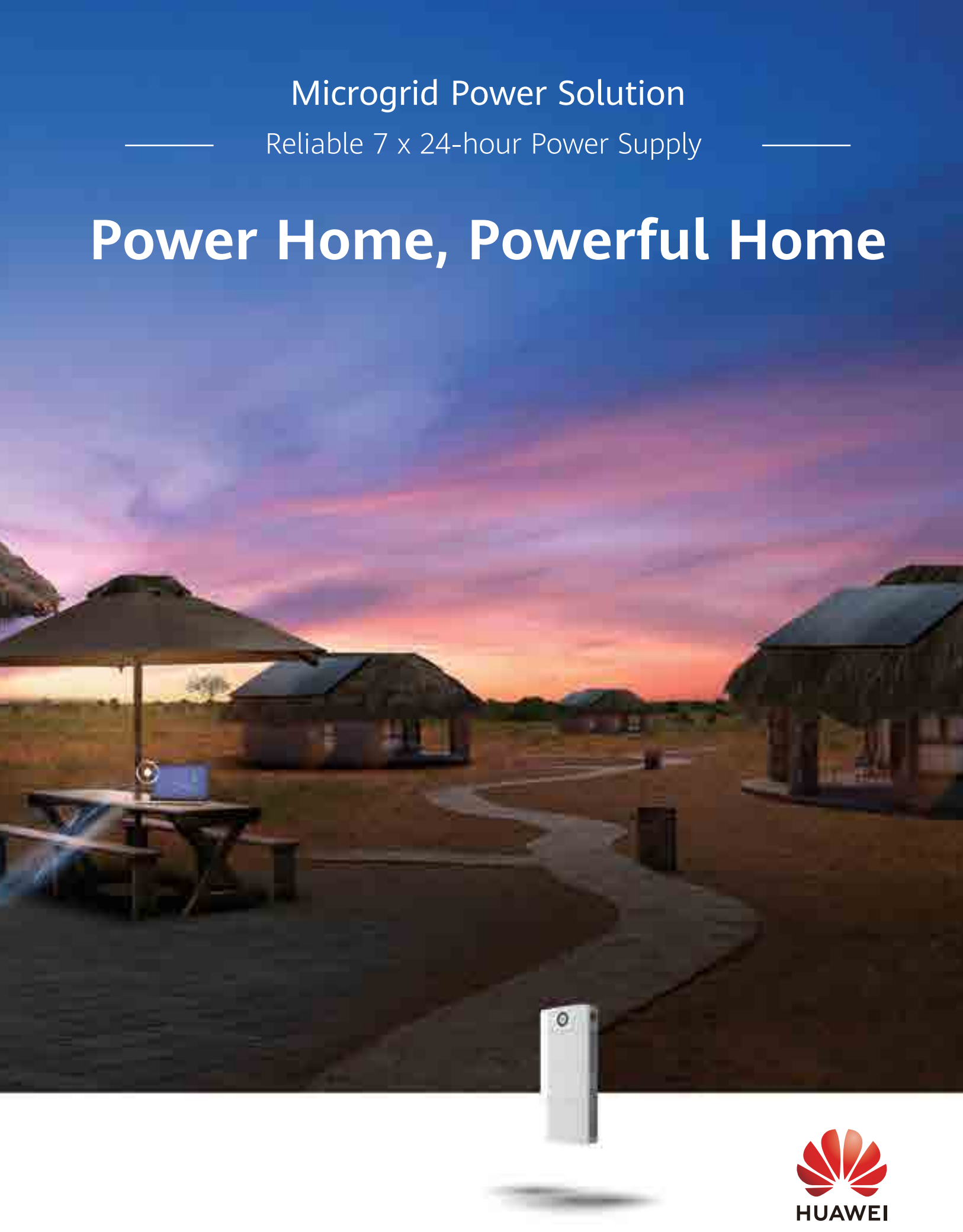
<29 dB
Ultra-quiet

24 Hr
Uninterrupted Power Supply

Microgrid Power Solution

Reliable 7 x 24-hour Power Supply

Power Home, Powerful Home



HUAWEI

When does digital become critical?

"Digital transformation is no longer just a project. It's a continuous and new way of doing business. It's a continuous investment and growth into new relationships and partnerships," says Centili Group CEO Zoran Vasiljev.

The COVID-19 pandemic has been a wake-up call for organizations globally. This is when everyone recognized that the world has changed and implications have emerged on various businesses because of the abrupt shift to digitalization. Hence, the process of identifying opportunities to build resilience, fuel growth, and innovate customer experience is ongoing.

Businesses, including telcos, are looking to accelerate digital transformation initiatives by doubling down on agile and flexible technologies that can make them competitive and successful against others in the market. In fact, a survey of Fortune 500 CIOs regarding 2021 budget priorities revealed that more than 77% of CIOs recognized digital transformation as their priority going forward.

Yet, 70% of digital transformation efforts have fallen short of reaching targets, as per a BCG research. Despite companies having huge expectations for digital transformation, what causes their digital transformation efforts to fail?

Technology over business

Based on an IDC spending guide, the worldwide spending on the technologies and services that enable the digital transformation (DX) of business practices, products, and organizations is forecasted to reach $2.3 trillion in 2023.

With huge investments allotted for this phenomenon, many organizations get carried away with innovative technologies and fail to consider their customers — the core of the business — who are the crucial drivers for a smooth overhaul. No matter how innovative the initiatives are, if the customers won't utilize them, the efforts become meaningless. This opens up an avenue for failure as companies tend to focus on technology and do not consider the needs of real people.

Understanding how customer demands are evolving, especially during uncertain times like the

pandemic, is crucial for success. Telcos, for example, must always consider their customer's end-to-end journey and include them in their digital transformation strategy.

Executives or leaders within organizations must have a broad, holistic view of what digital really means. In the ICT industry, we view digital as the nearly instant, free, and flawless ability to connect people, devices, and physical objects anywhere.

Lacking a clear definition of digital leaves companies adrift in the fast-evolving nature of digital adoption. No matter which industry it is, technology should never constrain any business from launching new imperatives. But this should be deployed in order to address the customers' needs and improve their overall experience. The right tools can enable this transformation, most often with the help of partners. As a result of collaborative efforts, the core management team, systems integrators, and other technological allies become part of the digital transformation process.

"Technology requires constant hands-on management to ensure that the business is adapting to the change in its DNA — and to ensure that future shifts, both internal and external, are accompanied by the appropriate flex of its tech stack," says Maria Martinez, chief operating officer, Cisco.

Thus, having the most advanced technologies can only go a long way if the direction of the company goes toward its clientele. As the company works on turning traditional to digital, technology becomes a vital component that would enrich relationships between businesses and consumers.

Transition within operations

While it can be difficult to shift mindsets to the new ways of working, embracing change is critical to the success of any digital initiative. It's either you keep the traditional approach of consulting an approval board to review changes and deny requests or gradually embrace new tools to bring the team operations into new heights of success.

The new-age telecom networks, mainly underpinned by 5G, are aimed at providing varied services and customized communication solutions to a wider range of customers. Thus, with the increased number of subscribers, the operational processes are bound to get more complex.

Services like customer support, CPE installation, and billing must hence be updated to tackle this complexity. In modern times, network automation software is also among the trends. In fact, software becomes an integral component of every part of a business rather than being deployed in some areas. Companies now interact with their customers through software delivered as online services or applications, compatible with different devices.

Software is vital in transforming every part of the value chain, such as logistics, communications, and operations. Commonly referred to as DevOps, barriers between two traditionally siloed teams — development and operations — are removed.

With a DevOps model, teams work together to optimize both the productivity of developers and the reliability of operations. Regardless of their organizational structure, they strive to maintain constant communication, increase work efficiencies, and improve the quality of services they provide to customers. Accordingly, the entire development and infrastructure lifecycle becomes part of their responsibilities.

If an organization wasn't able to keep up with the digital era and retain its operations based on legacy systems, digital transformation cannot be fully integrated. More so, a highly skilled team should be available to ensure that the quality, productivity, and security of business performance are optimal.

Lack of data infrastructure

By 2025, approximately 20 billion devices will be connected, nearly three times the general population. These devices have generated about 90% of the data produced in the world. With this massive amount, mining this data greatly enhances the power of analytics, which leads directly to dramatically higher levels of automation — both on processes and decisions.

This gives birth to brand new business models where the business dynamics are driven by market forces such as regulations, suppliers, customers, and even competitive pressure. One of the common pitfalls of digital transformation is lacking the proper steps needed to change the business strategy that corresponds to the technology strategy.

The worldwide spending on the technologies and services that enable the digital transformation (DX) of business practices, products, and organizations is forecasted to reach $2.3 trillion in 2023

In terms of artificial intelligence (AI) in the digital transformation journey, IT needs to evolve and have a heterogeneous data processing architecture to support AI-powered solutions. Without the right data infrastructure, an AI initiative will not succeed. More importantly, a legacy IT infrastructure must be capable to move and into a new digital architecture.

Many organizations collect a lot of data but fail to analyze and utilize it. Why? There's a lack of scalable data infrastructure built for end-to-end data flow. We must keep in mind that a successful digital transformation requires data-informed decisions. Thus, a solid data foundation should be present before you can actually move forward with the transformation.

Data is an incredibly valuable resource that should be integrated into business strategies. By analyzing and leveraging the collected data from business and customer activities, actionable insights and encourage data-informed decisions in your digital transformation efforts can be applied.

Telecom: B2B opportunity

The importance of business-to-business (B2B) digitization is easy to overlook due to the digital shifts underway in numerous B2C sectors and value chains. Nevertheless, B2B innovation can be just as disruptive. "Digital transformation is a huge focus for the telecom industry due to the gradual decline in revenue from traditional services. So, the industry needs to transform by improving efficiency, and by introducing a whole lot of new services," says Martin Creaner, chief architect of Huawei SPO Lab.

Digitizing B2B players within the telecom industry equates to lowering costs and improving the reach and quality of their offerings. Internationally, telcos have a great pedestal as they shift their digital transformation into high gear. Most of them are moving persistently to be successful. In terms of approach, if it is only technology-centered rather than customer-centered, it's not transformational.

As we see from both telecom operators and vendors such as Etisalat, Ooredoo, Zain, stc Group, Vodafone, Huawei, Nokia, ZTE, and many others, various products and solutions are deployed with customers in mind. These make their digital transformation initiatives effective and sustainable.

Aside from focusing on cost reduction, creating more value becomes the new way of business. While telcos are increasingly flexible around the concept of revenue sharing, launching digital services with more aggressive business models is still afoot. This is necessary to compete with OTT and hyperscalers in the battleground of new digital services.

As telcos become transformed digitally, more opportunities will open up that will benefit their businesses. The critical part is keeping this transformation continuous and sustain the deliverables needed. From a discrete physical network to a cloud-based network, telcos must be suited to handle millions of consumer devices to billions of IoT devices — embracing the shift to being a large-scale new digital services provider. TR

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Zoran Vasiljev, Group CEO, Centili

Zoran Vasiljev: Centili is raising the bar as a digital monetization company

Centili, a global digital monetisation company, is at the MWC 2021 in Barcelona showcasing and discussing the latest trends in digital monetization platform-as-a-service, an area the company has been focusing on for several years.

In an exclusive interview with Telecom Review, Centili Group CEO Zoran Vasiljev shares insights on the company's latest efforts in this emerging digital ecosystem.

Congratulations on being recognized as the most innovative mobile payment solutions brand in 2021. Can you tell us how Centili made this achievement?

We embarked on a strategy in 2020 to rebrand and reposition the company above and beyond as just a mobile payments organization to a complete digital monetization company. And with that in mind, we also put in place a new strategy, which we call shifting gears, which allowed us also to focus on the areas that matter the most to our customers and partners. One of the elements of the new strategy was to reposition and move the company away from just a payment gateway into a Platform as a Service, and a monetization platform company. That has put Centili and its brands in a different direction. We are very pleased that the industry, the market, and the customers are recognizing us as an innovative brand and company. After 10 years in existence, Centili is now moving and raising the bar to the next level.

What is the importance of having a good digital monetization platform for the telco operators' long-term revenue growth?

Telcos and the communication industry have been under pressure for a long time and have been disrupted. Over the last years, we have seen many operators looking for ways of entering and running digital businesses. To run a successful digital business, you either need to upgrade and modify the platforms, and the services you are offering to your customers or you need to set up a different business unit, a different venture, and invest in different systems.

Centili has built a business 10 years ago on the premise of helping operators monetize digital experiences. We have a robust platform that provides seamless integration into an operator backend

and operator system with one API, and at the same time, has acquired over 300 digital merchants that are willing and ready to monetize their content, services, or their apps into an operator base of users.

Centili has evolved and moved into a platform as a service model. We also provide white label solutions to operators, system integrators, and system aggregators. They would want to replicate the 10 years of service and work that we have put in and monetize faster and run a successful digital business.

What are the biggest advantages of telco players in utilizing your products Centili Maestro and Centili Fusion?

The two distinctive services or offerings that we've made over the last year are Centili Maestro, which is our white label platform as a service that we provide to operators who want to run their digital businesses independently. The platform comes all pre-loaded with merchants, different payment methods and additional services. It can authenticate the users and block fraudulent activities for a robust payment mechanism to facilitate bundle services offerings. That is where Centili Fusion comes into play because very often we have realized that many digital merchants or digital service providers would like to have a closer relationship with operators. And one way of doing that is to bundle their service in operator data packs or operator SIM cards. And that is done seamlessly through Centili Fusion whether it is a soft bundle, hard bundle, or some kind of data gifting whereby the merchant utilizes and purchases a large box of data through us from the operator to gift the data back to their users as either a reward system or an acquisition tool or as a stimulus to continue to use the service more and make it more attractive.

In a world where telcos strive to shift from being CSPs to DSPs, how can Centili support this digital transformation?

Digital transformation is no longer just a project. I think it's a continuous and new way of doing business. It's a continuous investment and growth into new relationships and partnerships. Centili has positioned itself as a company that invests and takes time to understand the problems of our customers and their industries to create a platform and an ecosystem from which everybody can benefit without repeating or doing something that is not their expertise. Telcos should continue to provide telco services and do the best that they can do. Digital companies should focus on digital creation and be innovative as there are enablers and ecosystem orchestrators as well. That is how we see our value as a company to bridge and enable different components of this ecosystem to work together without feeling that there's a threat or competition. I think it's all about just making sure that as you orchestrate, it is safe, secure, and makes money in the marketplaces that you choose to go.

What can we expect from Centili for the rest of 2021 and the years to come?

We are on a growth trajectory as a company that is continuously looking to expand its scope. We are in a place where we want to scale up. There are a couple of acquisitions that we are looking to make. We are going to continue to invest in our platform and services. We are going to see an explosion of Centili Maestro as our platform as a service model as something that has been very well received from the market and our customers, something that's also very well understood. And I think with that we are probably kind of carving out a nice niche space for Centili to claim the space and continue to be one of the leading digital monetization companies in the world. TR

Tariq Al Awadhi, chairman of Arab Spectrum Management Group (ASMG) and the executive director of Spectrum Management Affairs at TDRA

Radio spectrum is a key enabler for UAE's digital economy

The United Arab Emirates (UAE) is considered one of the most advanced countries in the field of telecommunications and the adoption of modern technologies. In line with this, its national government undertakes the task of evaluating the need to appropriately allocate and enforce specific radio spectrum uses.

The Telecommunications and Digital Government Regulatory Authority (TDRA) in particular houses the Spectrum Management Affairs department which is responsible for monitoring, planning & allocation, and services. To understand better the role and importance of radio spectrum not only in the UAE and MENA region but globally, Telecom Review spoke with Tariq Al Awadhi, chairman of Arab Spectrum Management Group (ASMG) and the executive director of Spectrum Management Affairs at TDRA.

Radio spectrum is the cornerstone of wireless connectivity. What are the efforts/approaches being done by ASMG and TDRA to address the spectrum needs and encourage fair spectrum usage in the Arab community?

Spectrum scarcity is relative to the frequency ranges due to radio wave propagation. It is the UHF (300 MHz to 3 GHz) and now SHF (3 to 30 GHz) frequency ranges that are subject to competing requirements. The challenge is to encourage new use while protecting the existing use. TDRA

and ASMG have been leading efforts to encourage the introduction of wireless broadband at a minimal cost. The radio frequencies below 1 GHz offer excellent coverage for the air interfaces of IMT. ASMG was the leader in proposing the 700 MHz band identification for IMT at WRC-12. Then for 5G, due to ecosystem, ASMG again took lead in identifying the 3.4 GHz band for 5G use even before the WRC-19.

With 5G, IoT, satellite innovation, and increased smart use cases, creating sufficient spectrum capacity is a must. How can harmonization, coverage, and cost-efficiency be achieved with all these targets in mind?

5G is the core platform to offer IoT, smart city applications, and hybrid satellite and terrestrial systems. 5G use cases can adequately meet the connectivity needs of very low data for IoT to very high data needs for video surveillance in smart cities. Harmonization is the key for economies of scale. 5G harmonization has been driven by chipset availability and that is why ASMG's decision to allow 3.4 GHz was the key enabler to have the maximum 5G launches by some Arab Countries with UAE leading the 5G deployment.

What is being done within your particular organizations in preparation for WRC-23? Which part of the WRC-23 agenda and discussions would impact the MENA region the most?

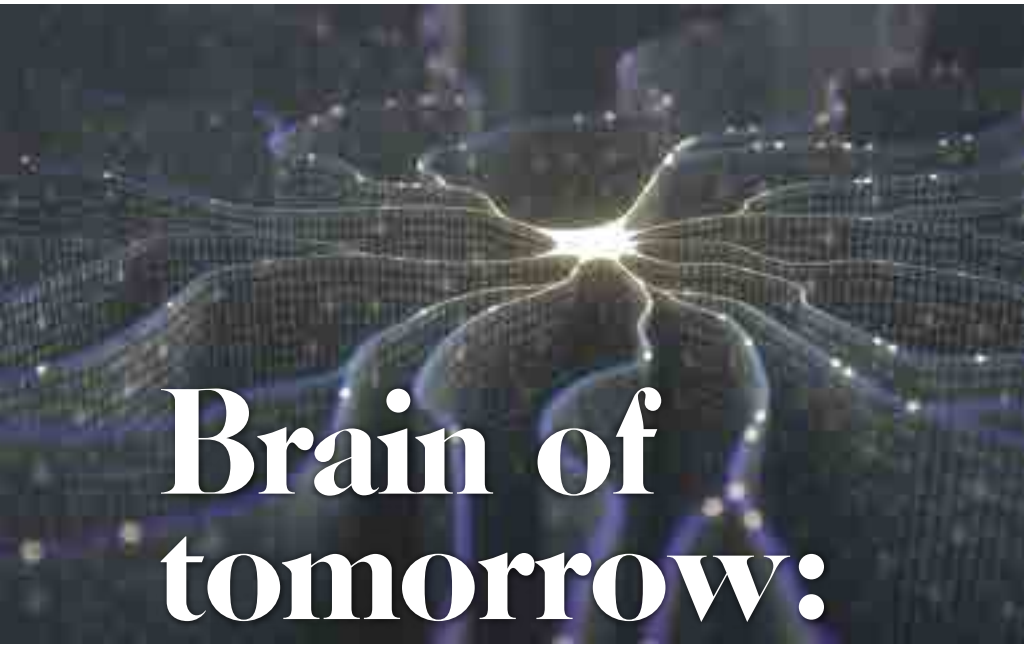
All the WRC-23 agenda items are important and invite studies on issues that need global consensus and changes to radio regulations. The first five agenda items are related to mobile services and have the most active discussions and it will remain the prime focus during the WRC-23. These agenda items have diverse support depending upon the uptake of existing services and need for mobile in these frequency ranges. TDRA is also engaged in the ITU-R WP5D and TG6/1 and actively engaging the technical and regulatory discussions.

UAE has a global leadership position within the ICT sector. What is the major contribution of the spectrum — as an enabler and an innovation catalyst for industries — to the fast digitalization in the country?

UAE has a future foresight plan. TDRA has issued the UAE Spectrum Outlook for the period 2021-2025 and the UAE strategy for 5G and beyond for the period 2021-2025. Both of these plans show that radio spectrum is one of the key enablers for the digital economy of the UAE including Industry Revolution 4.0, smart cities, digital lifestyle, digital services, etc.

In a long-term perspective, how can proper spectrum allocation as well as efficient and effective spectrum management globally improve digital inclusion?

Spectrum use has considerable social importance from the point of view of a state's obligations to protect the basic rights of its citizens. That is why the telecom law of each country sets the framework for spectrum management at the global level along with the ITU-Radio regulations which have a treaty level status. Digital Inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of information and communication technologies (ICTs). The most economical way to offer connectivity is through a mobile phone. The global smartphone penetration rate is estimated to have reached 78.05% in 2020. This is based on an estimated 6.055 billion smartphone subscriptions worldwide and a global population of 7.8 billion (Source: Statista.com). According to GSMA, 51% of the global population has internet connectivity through a mobile phone and this percentage will continue to increase. UHF spectrum allocation for IMT will enable a more affordable network rollout in countries with large geographical areas and the ability to reach pockets of the population in rural areas. TR



Brain of tomorrow:

Artificial neural networks

With the proliferation of artificial intelligence and deep learning technologies, networks that replicate the functions of the human brain, the smartest and most complex known creation, have been created. You can thank these artificial neural networks (ANNs) for many of applications we use every day, such as Google's search engine, Apple's Face ID iPhone lock, and Amazon's Alexa AI-powered assistant.

"I'm not suggesting that neural networks are easy. You need to be an expert to make these things work. But that expertise serves you across a broader spectrum of applications," said Stefano Soatto, vice president of applied science for Amazon Web Services AI.

In fact, the idea behind artificial neural networks has existed for many decades. But, with the fourth industrial revolution driving digital transformation further, the promises of neural networks have turned to reality and helped the AI industry come into shape.

Understanding artificial neural networks

As technology becomes more advanced, artificial intelligence becomes a much needed component in various smart operations. If you come to think of it, neural networks reflect the behavior of the human brain. Mimicking the way that biological neurons send signal to one another, these networks allow computer programs to recognize patterns and solve common problems in the fields of AI, machine learning, and deep learning.

The only way that neural networks can do their purpose is to undergo training of data to learn and improve accuracy over time. Hence, they are composed of an input layer, which receives data from outside sources — can be data files, images, sensors, microphone, etc.; hidden layers that process the data; and an output layer that provides data points based on the set network function.

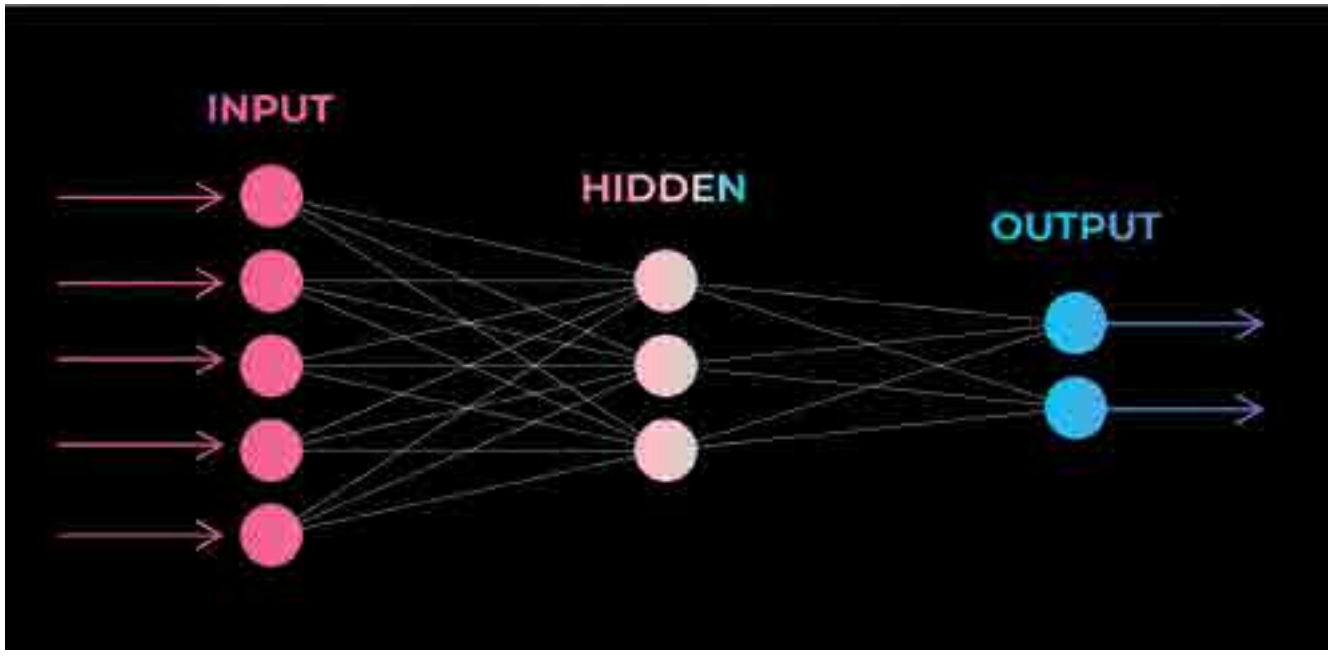
Most modern machine learning libraries have greatly automated the training process within neural networks. At its core are artificial neurons. Each neuron receives data inputs from several other neurons, multiplies them by assigned weights, adds them, and passes the sum to one or more neurons.

Based on what the machine learns about the data when processed by one layer, it determines how to move it through to the next layer based on the value it receives when evaluated. Based on the complexity of the data at hand, it can continue to process through more layers until delivered to the output layer.

ANN can be most efficient when trained to compare the outcome a machine gets with the human-provided description of what outcome is expected. If these don't match, via backpropagation, the machine uses this feedback and goes back to adjust the weights of the layers. By adopting new learning rules, this can guide the neural networks on future processing.

When done manually, this will take ages to accomplish. But when you place thousands of neurons in multiple layers and stack them up on top of each other, you'll obtain an artificial neural network that can perform very complicated tasks.

From medical analysis to supply chain tracking, artificial neural networks can be used in a number of ways to classify



information, cluster data, or predict outcomes. Analyzing data, transcribing speech into text, powering facial recognition software, or predicting the weather, are just some of the most common use cases of these networks.

Human brain vs. AI

Intelligence has truly been revolutionizing in the digital era. With this comes the debate in whether AI can beat the human brain, or better yet, can it replace it altogether? Despite the exhaustive efforts done, the essence of the natural brain still remains competent against AI.

The original vision of the pioneers of artificial intelligence has been inspired from the physique and functions of the human mind. The brain's biological neural network consists of approximately 100 billion neurons that perform their functions through massive connections linking each other, called synapses. Every function of the brain involves electrical and chemical signals simultaneously.

With this in mind, artificial neural networks are still quite different from their human counterparts. Unlike the human brain, which is continuously learning to do things through sense and reference frames, neural networks need millions of examples to come up with an accurate prediction in time.

In addition, neural networks are also bad at generalizing. As mentioned, a neural network must be trained for data processing and has specific sets of function. Thus, it will perform accurately a task it has been trained for, but quite poorly at anything else.

For instance, a ring classifier trained on thousands of ring pictures will not be able to detect other types of jewelry like necklaces, unless you input new images that could identify this value. Unlike humans, neural networks don't develop knowledge in real-time via sensory, they process pixel values.

Often described as black boxes, neural networks express their behavior in terms of neuron weights and activations. The black box issue means that the approximation given by the neural network will not give you any insight between the weights and the function. Thus, from a traditional statistics viewpoint, a neural network is a non-identifiable model: given a dataset and network topology, there can be two neural networks with different weights but have exactly the same result.

Neural network innovation

Any simple action that a human being makes requires calculations that none of today's supercomputers can accomplish in the same way. Our brain does it all in a very fast, accurate and efficient way in milliseconds, when AI requires a lot of intensive training to be even 50% precise than average.

As neural network innovation continues, more development on how ANNs can eventually renew and restructure can emerge. It is important to consider that a single neuron is meaningless but the ability to process the data according to their simple codes and to transmit the results to create connections with other neurons is groundbreaking in the reality that simple parts make up a larger whole.

Once it is all arranged with seamless interactions creating perfection, agility and efficiency, this technology can bring up more opportunities in the future. Nowadays, neural networks have been successfully applied to the broad spectrum of data-intensive applications such as machine diagnostics, fraud detection, portfolio management, and credit rating, among others.

For telecoms, the application of neural networks to nonlinear channel modeling and identification can also be used for several purposes such as channel design, transmitter and receiver design, (beamforming and adaptive antennas), computer simulation and performance evaluation of communications channels, diagnoses, and fault detection. TR

Etisalat, du to provide telecom services within local communities

Etisalat and du have finalized their master developer agreements (MDA) with Mohammed bin Rashid Housing Establishment (MBRHE) where both operators will cover MBRHE's mega housing projects. They would provide essential telecommunications infrastructure through the Taawun infrastructure deployment initiative.

Saeed Alzarouni, senior vice president, mobile network, Etisalat said, "Taawun is an initiative we are deeply invested in at Etisalat, as it aligns closely with our commitment to support the government's vision and the development of smart technologies and enable digital transformation across UAE. We are honored to collaborate with Mohammed bin Rashid Housing Establishment to deliver superior digital and communications infrastructure to our customers in line with our overall strategy and vision of 'Driving the Digital Future to Empower Societies'. This agreement reaffirms our continued efforts to enter into partnerships, enhance our offerings across the UAE, and cater to the needs of generations to come."

Under the MDA, du and Etisalat will install, maintain, and oversee state-of-the-art fixed telecom services and solutions across mega housing projects in Oud Al Muteena, Hatta, Al Warqa 4, and Muhaisnah.

The agreement would also help in achieving the strategic objectives of MBRHE to create high-end residential communities offering comprehensive services. Aiming to increase the levels of satisfaction of UAE citizens in Dubai, they can now choose the retail telecom operator of their choice without experiencing any disruption while moving into their new home. The arrangement will further support the government's long-term vision in developing smart infrastructure and establishing a robust telecom sector for master developers.

Saleem AlBlooshi, chief technology officer, du, said, "Making valuable contributions to community transformations is an integral part of du operations. With smart infrastructure development becoming an increasing priority at the national level, we are proud to lend our support and expertise to ensure master developers reap the rewards of a telecom sector that meets every demand through world-class infrastructure and resources. At du, we have always worked proactively in line with the UAE's sustainability agenda. Today's announcement represents the next phase of this enduring principle, and we are proud of our partnership with MBRHE. Now more than ever, residential communities require comprehensive telco services, with seamless capabilities and without disruption. This is what we will deliver through this collaboration."

stc reports highest Q2 and H1 2021 financial results

stc announced the company's preliminary financial results for the period ending at 30 June 2021.

Net profit for the 2nd quarter stood at SR 2.82 billion with an increase of 3.56% compared to SR 2.72 billion in Q2-20. For the first half of 2021, the net income reached SR 5.77 billion with an increase of 2.41% from SR 5.63 billion in H1-20.

Revenues for the 2nd quarter reached SR 15,899m with an increase of 6.56% compared to the corresponding quarter last year. For the first half of 2021, the revenues reached SR 31,594m an increase of 9.49%.

The company has approved distribution of SR 1 per share dividends for the 2nd quarter, totaling of SR 2,000 million.

Gross profit for the 2nd quarter reached SR 8,352m with an increase of 0.13% compared to the corresponding quarter last year. For the first half of 2021, the gross profit reached SR 16,909m with an increase of 2.25%.

Operating profit for the 2nd quarter registered SR 3,250m with an increase of 6.14% compared to the corresponding quarter last year. In H1 2021, the operating profit reached SR 6,732m with an increase of 10.98%. Earnings before Interest, Taxes, Zakat, Depreciation and Amortization (EBITDA) for the 2nd quarter amounted SR 5,627m with an increase of 5.34% compared to the corresponding quarter last year. For the first half of 2021, the Earnings before Interest, Taxes, Zakat, Depreciation and Amortization (EBITDA) reached SR 11,468m with an increase of 7.47%.

Etisalat Group reports AED 4.7 bn consolidated net profits for H1 2021, up 3.9% YoY

Etisalat Group has announced its consolidated financial results for H1 ending 30th June 2021.

The group reported consolidated revenues amounting to AED 26.4 billion representing YoY increase of 3.2% while consolidated net profit after Federal Royalty amounting to AED 4.7 billion representing a year over year increase of 3.9% and resulting in a net profit margin of 18%. The group had reported consolidated net profits to AED 4.6 billion same time last year.

Consolidated EBITDA reached AED 13.4 billion resulting in EBITDA margin of 51%. The board has approved interim dividend for H1 2021 of 40 fils per share.

In the UAE the subscriber base reached 12.1 million subscribers in H1 of 2020, while the aggregate subscriber base reached 156.1 million, representing a year over year increase of 7%.

Commenting on the results, H.E. Jassem Mohamed Alzaabi, chairman of Etisalat Group said, "Etisalat continued to demonstrate strong performance showcasing growth across its operations for the first half of the year, thanks to our continuous efforts and focus on our vision of driving the digital future with a strong commitment towards the societies we serve and adding value to our shareholders."

Meanwhile, Eng. Hatem Dowidar, CEO, Etisalat Group said, "Etisalat Group's strong results in the first half of 2021 is an outcome of our sincere efforts to drive growth and generate efficiencies, with an unwavering commitment to key strategic priorities to enable a digital future and drive digital innovation across our operations. Despite the challenges in our key markets, our businesses delivered growth in revenue, net profit and operating free cashflow."

Zain retains title of 'fastest fixed internet' in Saudi Arabia

Adding to its achievements on 5G and connectivity, Zain KSA has once again won Ookla's Speedtest Award as 'fastest fixed internet' in Saudi Arabia for the first half of 2021. The telco operator has won for the third time in a row, reflecting its commitment to offering the best speeds through the region's largest 5G network.

This recognition confirms Zain KSA's major role in the Kingdom-wide digital transformation and the fulfillment of Saudi Vision 2030's goals. More so, the company continues to have the largest 5G geographic coverage in the Kingdom. Known as the first in the Middle East, Europe, and Africa (MEA) and fourth globally, Zain KSA's 5G network covers 50 cities via more than 4,700 towers.

During the first half of 2021, Zain KSA has recently stood out with the best 5G network and data performance in the capital, Riyadh, according to a report by umlaut. Zain KSA's cutting-edge network led Riyadh to have the fastest 5G among other capitals of the world, with customers enjoying the highest upload and download speeds as well as the fastest YouTube video start time with excellent resolution. With at least a 98.8% rate, the reliability of Zain KSA's 5G data service also showed an excellent performance.

Additionally, in the Q1 2021 Meqyas report issued by the Communications and Information Technology Commission (CITC), Zain KSA was first in delivering the best 5G services, ranking first in 5G deployment and recognized as the best performing operator in the mobile 5G average download speed.

Also, Opensignal has granted Zain KSA three awards namely "Best 5G Availability," "Best 5G Download Speed," and "Best Download Speed Experience - 5G Users" while CITC's Q1 2021 Game Mode report records the telco operator with the top connectivity performance in most popular video games in the Kingdom — Fortnite, FIFA 21, APEX Legends, and Dota 2.

stc ranks first place for 5G coverage in KSA

Communications and Information Technology Commission (CITC) has ranked stc in the number one position for excellent 5G coverage in 43 new governorates across Saudi Arabia in its Meqyas Quarterly Report for Internet Speeds and Digital Content Access Speed.

Furthermore, stc was also able to provide 5G services, bringing the number of covered governorates to 53 throughout KSA. The CITC report saw stc ranked top in Mobile Service Provider Speeds, with mobile internet average download speed being up to 130.84 Mbps and mobile internet average upload speed being up to 23.52 Mbps. As for Fiber-optic Speeds, stc also achieved the first place in fiber-optic internet average upload speed reaching 39.41 Mbps.

stc attributes its achievements as the result of its efforts in supporting innovation and creativity programs and in offering comprehensive solutions in telecommunications and digital empowerment.

stc is consistently enabling the digital transformation of the public and private sectors and strengthening the cloud infrastructure of the local digital economy in terms of artificial intelligence, IoT and cloud computing in line with the Saudi vision 2030 agenda.

CITC Quarterly releases the Report for Internet Speeds and Digital Content Access Speed in the Kingdom "Meqyas", which compares the speeds of service providers in the Kingdom through download, upload and 5G speeds, ranks the best performing operators in each region and covers the most commonly used applications and video games in the Kingdom.

Ooredoo hailed as fastest mobile network in Kuwait

Ooredoo won Ookla's Kuwait Speedtest Awards for mobile network speed during the first and second quarter of 2021. As per the conducted tests, Ooredoo achieved a speed score of 79.47, with average download speeds of 108.05 Mbps and average upload speeds of 25.34 Mbps.

Proudly earning this accomplishment, Ooredoo Kuwait has also taken major steps in the world of telecoms over the past two years and during the pandemic. By strengthening its networks, the company has outperformed its Kuwaiti competitors in providing the best and fastest coverage. The network infrastructure witnessed a significant upgrade with KWD 68 million investment.

Increasing to nearly 2,000, the number of its 5G towers ensures a broader and more comprehensive coverage across all residential areas of Kuwait, including chalets, farms, and islands. Furthermore, 1,000 Long Term Evolution (LTE) expansions and upgrades were deployed enabling faster data speeds, improving performance, and lowering operating costs.

In a statement on this occasion, Abdulaziz Yaqoub Al-Babtain, CEO of Ooredoo Kuwait, said, "We take pride of this achievement, which reflects our continuous efforts to achieve our vision of enriching people's digital lives, which goes in line with our strategy to empower Kuwait's society by driving digital transformation. This strategy has continually ignited us to efficiently respond to the rapid changes and changing demands of our customers, and proactively provide them with effective digital solutions, products, and services."

"We have been working towards providing the best and fastest coverage at the state level, especially in developing the infrastructure of the Ooredoo network. An amount of KWD 68 million has been invested over the past two years with the aim of developing the network infrastructure and enriching our customers' digital experience. Today, we thank them all for their trust and great loyalty," Al-Babtain concluded.

Integrated Mobile Telecom Co. Ltd signs MVNO agreement with Zain KSA

Integrated Mobile Telecom Co. Ltd signed an agreement with Zain KSA to benefit from Zain KSA's expansive network infrastructure in order to provide mobile telecommunications services to its customers. Integrated Mobile Telecom Co. Ltd has recently been licensed as a Mobile Virtual Network Operator (MVNO) by the Communications and Information Technology Commission (CITC).

The agreement was signed by CEO of Zain KSA, Eng. Sultan bin Abdulaziz Al-Deghaither, and CEO of Integrated Mobile Telecom Co. Ltd, Abdul Mohsen bin Abdullah Al-Juwayan.

Commenting on the agreement, Integrated Mobile Telecom Co. Ltd CEO Abdul Mohsen bin Abdullah Al-Juwayan said, "We are pleased to sign a MVNO agreement with Zain KSA, as this strategic partnership aspires to facilitate and contribute to the growth and expansion of the Saudi telecommunications market, valued at around 69 billion riyals. In addition, it will contribute to fueling competition which would positively influence society and consumers both individuals and institutions alike, by providing distinguished services and innovative digital technologies, powered by Zain KSA's elaborate 5G network in the Kingdom and the Middle East."

On his part, Eng. Sultan bin Abdulaziz Al-Deghaither said, "Through this strategic partnership with Integrated Mobile Telecom Co. Ltd, we aspire to provide additional options for users, in line with the sector's goals under the guidance of CITC, and in congruence with the goals of Saudi Vision 2030 to transform into a digital society by making Zain KSA's infrastructure of towers and frequencies available to a wider segment of users from the Integrated Mobile Telecom Co. Ltd enabling them to benefit from the largest 5G network in the Kingdom and the region."

This agreement represents one of the aspects of the strategic cooperation between Zain KSA and Integrated Mobile Telecom Co. Ltd. which aims to enhance the positions of the two companies and expand the reach of their ICT services and solutions on the widest scale across the Kingdom. This offers individuals a greater opportunity to benefit from the vital services of this sector which has become fundamental for fulfilling individuals' various daily needs, and at the same time stimulates the sector's competitiveness in terms of the quality and price value of provided services which would ultimately benefit the final consumer. Under the new license, Integrated Mobile Telecom Co. Ltd will provide virtual mobile communications services, including voice services, internet services, as well as a number of mobile communications services such as SMS, voice mail, media services and others, utilizing the advanced infrastructure of Zain KSA, owner of the largest 5G network in the Kingdom and the region.

Ooredoo Group publishes H1 2021 results

Ooredoo Group announced the results for the half year ended 30 June 2021. First half 2021 revenue stood at QAR 14.5 billion, an increase of 3% compared to the same period last year, mainly driven by growth in the operator's operations in Qatar, Indonesia, and Tunisia. Excluding FX impact, revenue increased by 5%.

Group EBITDA for H1 2021 was QAR 6.4 billion with a corresponding EBITDA margin of 44%, driven by growth in Indonesia, Qatar, Kuwait, Tunisia, and Algeria. The EBITDA growth rate stood at 7% and at 10% excluding FX impact.

Consolidated customer base increased by 1% due to growth in Indonesia, Oman and Iraq, offsetting the decline in other markets.

Group Net Profit attributable to shareholders turned negative due to impairments (QAR 2,341 million, mainly from Ooredoo Myanmar) partially offset by profit from the sale and leaseback of Indosat Ooredoo's tower assets (QAR 1,000 million). Excluding these one offs and FX impact, Net Profit increased by 52%.

On May 11, regulators approved Indosat Ooredoo's sale and leaseback agreement with Edge Point Indonesia for more than 4,200 telecommunications towers. The transaction was valued at USD 750 million, making it one of the largest deals of its kind in Asia.

On June 30, Ooredoo Group extended the exclusivity period of the non-legally binding MoU with CK Hutchison to August 16, 2021, in relation to a potential transaction to combine their respective telecommunications businesses in Indonesia. This extension will provide more time to complete the ongoing due diligence and negotiate the final terms of a possible combination of the entities.

Commenting on the results, HE Sheikh Faisal Bin Thani Al Thani, chairman of Ooredoo, said, "We had a good first half of the year, with a revenue increase of 3%, as we further progressed our digital strategy, whilst effectively managing our costs and overheads to support the growth of our business across our various markets. Consequently, our EBITDA margin improved to 44%, up from 42% for H1 2020, despite the challenges presented to us due to COVID-19."

Internet sovereignty: Quest for a secure connectivity?

To say that the internet has become the lifeline of the 21st century would be an understatement. From running industrial and government networks to enabling content consumption and remote education and work, the need for connectivity has become a determinant factor in the global digital economy.

Furthermore, the ubiquity of the internet has now managed to prominently enter into the scope of a country's sovereignty. The exchange of internet traffic resulting in the generation of zettabytes of digital data via connected devices is being seen as the 'new oil' by data-hungry marketers. Hence, considering the adverse ramifications of a hyper-connected world, securing the internet from threats of data theft and privacy breach is becoming the primary focus of some nations. Some have already set the ball rolling to build an alternate internet exclusive to their country.

In recent news, Russia successfully detached from the global internet on a trial basis between June and July 2021, according to RBC daily, a business daily newspaper in Russia. The daily report was based on the document from the working group that is responsible for the country's internet security.

The RBC also cited their sources in the working group confirming the success of the tests that involved Russia's major telecoms firms. The tests were performed to determine the ability of the 'Runet' - the Russian-language community on the Internet and websites - to work in case of external distortions, blocks, and other threats as well as to assess the capability of physically disconnecting the Russian part of the internet. However, clarity on the length of the disconnection or any noticeable disruptions to internet traffic have not been established due to the general secrecy of the process.

According to the RBC report, Roskomnadzor, Russia's state

communications regulator said the tests were aimed at improving the integrity, stability, and security of Russia's internet infrastructure. The new system once in operation will aim to protect Russia from incoming cyberattacks. Essentially, all ISPs in the region will re-route web traffic in Russia to exchange points controlled by Roskomnadzor. The system will use proxy servers to steer data packets of information away from the public DNS resolver by default, identify data location, and either let that information pass, redirect it, or block it completely.

Russia's Information Security Working Group that is responsible for the project has Natalya Kaspersky, the co-founder of Kaspersky Lab as one of its members. Kaspersky Lab has faced backlash abroad over charges that the Russian government used its products to spy on computers.

Fight over cyberspace

The tussle between the US and Russia over the supremacy of cyberspace has become well-publicized by now. In late 2019, Russia adopted the 'sovereign internet' law that seeks to protect the country from being cut off from foreign infrastructure in response to what Russia calls the "aggressive nature" of the United States' national cybersecurity strategy.

Under the Roskomnadzor's radar US-based internet platforms, including Facebook, Twitter, Google and YouTube are constantly monitored for posting of material deemed illegal by Russia. The state internet security agency has warned the platforms for punitive sanctions upon failing to abide by the country's sovereign internet law.

Although not as stringently as China, over the recent years, Moscow has implemented stronger internet laws that require search engines to delete some search results, messaging services to share encryption keys with security services, and platforms to store user data on servers in Russia. Conversely, responding to recent massive ransomware attacks on thousands of American companies and individuals, US president Joe Biden stated on July 9 promising to "take any necessary action to defend its people and its critical infrastructure." The US has pointed fingers at hackers based in Russia for most of the cyberattacks in their country.

The plan

Russia has spent about $300 million on its sovereign internet plan. In recent years, Russia has blocked access to certain services, be it VPNs or encrypted messaging apps; however, industry experts feel that it is unlikely that the Russian government can exercise on its citizens the level of control that China does with its web access mechanism-- the Great Firewall.

Experts argue that Russia would not be able to completely operate in a way like China does because Russia's internet was built to be open. On the contrary, China took over the control of web access just two years after the internet first entered the country in 1996 when all service providers were licensed by the government and all internet traffic was going through state-owned telecommunication companies. Despite the early start and heavy investment, China's internet cannot be deemed fully impenetrable.

The fallout

In a classic example of the 'Splinternet' – the fragmentation of the internet - the governments of China and Russia are essentially trying to develop secondary networks that run under the authority of the respective governments. However, from a business perspective, it may make things difficult because the services and communications required for a free-flowing trade environment may be hampered once detached from the global internet, thereby limiting international economic connectivity.

Conversely, for the sake of argument, one may cite the example of China's economic success despite its aggressive web access policies, however, one should not forget China's robust e-commerce and mobile app ecosystem that it had built over the years and continues to do so. As per GlobalData forecast, the e-commerce market in China will reach US$3 trillion in 2024 whereas in the case of Russia such an ecosystem is a far cry when compared to that of China.

One of the major benefits of the internet is its ability to transcend borders as a trade mechanism. Consider this. As of January 2021, there were 4.66 billion active internet users worldwide, which is 59.5% of the global population out of which 92.6% (4.32 billion) accessed the internet via mobile devices. Given the growing trend of online purchases and virtual meetings, if a country is serious about attracting foreign investment to improve their economy, they have to keep the internet as open as possible. TR

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Mohammed Ershad: ershad@tracemedia.info

MTN GlobalConnect and CAMTEL accelerate Cameroon's fibre network and digital journey

MTN GlobalConnect and CAMTEL have joined forces to establish a strategic partnership that will see the commercialisation of four submarine cables in the West and Central sub-region of Africa. The partnership will improve connectivity in Cameroon and support the increasing demand for internet capacity.

CAMTEL, the State-owned telecommunications Operator in Cameroon has access rights on four subsea cables that are key for the connectivity of the sub-region, namely: WACS, SAT3, NCSCS and the SAIL subsea cable that connects Cameroon to Brazil.

Within the framework of this partnership, MTN GlobalConnect lessens the gap between its partners and the West coast of Africa. This partnership accelerates Cameroon's digital transformation journey and enable the country to position itself as a digital hub for the region.

"We believe that everyone deserves the benefits of a modern connected life," said MTN GlobalConnect CEO Frédéric Schepens. "By working closely with CAMTEL, we are delighted to be part of Cameroons digital journey and leverage their extensive fibre network in the Cameroon and in turn grow our fibre railway ambitions for Africa."

As a Pan-African wholesale and infrastructure services company with deeply anchored roots in the continent, MTN GlobalConnect continues to establish strategic partnerships that support the African developmental agenda, and the national priorities of Cameroon in particular.
Schepens went on to say, "In line with our Ambition 2025 strategy—this collaboration with CAMTEL demonstrates how, in partnering with our host countries and state-owned entities, MTN GlobalConnect is committed to growing digital connectivity between African countries and the rest of the world."

As Cameroon's telecommunication infrastructure operator, CAMTEL ambitions to position itself as the digital hub for the Central Africa region with cross-border fibre optics connectivity to extend its solid international submarine cable assets to benefit communication service providers in Cameroon as well as neighbouring countries such as Chad, Gabon, Nigeria, among others.

Judith Yah Sunday, CAMTEL CEO explained that "this strategic partnership between CAMTEL and MTN GlobalConnect represents a milestone in the implementation of Cameroon digital economy development program and more specifically in the increased monetization of our subsea assets in line with our ambition to turn Cameroon into the digital hub of Central Africa".

SES Networks and iSAT Africa agree to revolutionise 4G connectivity across Africa

To connect Africans living in underserved areas with reliable mobile connectivity, fixed satellite solution and professional service provider, iSAT Africa and SES, the leader in global content connectivity solutions have joined forces to provide new 4G connectivity first via SES's O3b medium earth orbit (MEO) constellation to subsequently migrate and expanded to SES's next-generation MEO system, O3b mPOWER, in 2022.

The development is the result of a three-year partnership agreement signed by the two companies.

iSAT Africa is well-established in the region for embracing innovative mobile internet connectivity solutions for unconnected rural communities in Africa. Through SES's highly-flexible and scalable O3b mPOWER system that can deliver low-latency high-speed connectivity services from tens of megabits to multiple gigabits per second to a single site, iSAT Africa will be able to quickly scale its network to meet anticipated extensive connectivity demands. The fibre-like connectivity will equipe iSAT Africa to enable local mobile operators to deploy 4G services to close the digital divide. iSAT Africa is among the first companies in Africa to sign up for O3b mPOWER.

According to the GSMA 2020 report, mobile coverage has been expanding in Sub-Saharan Africa quickly; 3G coverage expanded to 75% compared to 63% in 2017, while 4G doubled to nearly 50% compared to 2017. However, the coverage gap in Sub-Saharan Africa remains the highest globally as it is home to 67% of the world's population not covered by mobile broadband. This is because attempts to deploy 4G networks in sparsely-populated rural and remote areas continue to be an economic challenge. With telcos and internet service providers increasingly seeking innovative, cost-effective yet reliable connectivity solutions, SES's MEO satellite-based MEF-certified service that can ensure seamless interconnectivity with any network is an ideal solution.

PCCW Global to execute new submarine cable for Malta's new connectivity

GO announced a €25 million investment in LaValette, a new submarine cable that directly connects Malta to France, Egypt, and beyond, and will be a part of PCCW Global's Pakistan East Africa Connecting Europe (PEACE) project.

Nikhil Patil, CEO, GO plc said, "GO has always been on the right side of history when it comes to investing in Malta's connectivity to the rest of the world. Our purpose is to drive a digital Malta where no one is left behind. Over the last five years we have invested over €100 million in digital infrastructure in Malta to bring our purpose to life. We plan to invest at least another €100 million over the next 5 years."

Due to be completed and operational by February 2022, this 30-month project includes multiple landing points, such as Pakistan, Kenya, Egypt, Cyprus, Djibouti, France, Saudi Arabia, and Singapore. The total length of this underwater cable is 12,000 km, 3,785 km of which covers just the Mediterranean part of the system.

GO entrusted PCCW Global to execute this project due to its extensive experience in global networks and submarine cable projects. Addressing the launch event, Tamer El Gazzar, sales director (the Middle East and Africa) at PCCW said, "Together with GO, we implemented a state-of-the-art technology deploying the highest capacity per fiber pair. The LaValette system follows the shortest and fastest direct route from Malta to France, and from Malta to Africa and East Mediterranean, thus giving Malta whole new connectivity to Europe and the Middle East. The system will also give Malta open access to data centers in France, Egypt, Djibouti, and Kenya."

Representing a major milestone in Malta's communications history and a huge investment by GO in the country's connectivity needs of tomorrow, LaValette makes GO the first and only operator to have access to international connectivity from ashore aside from where the rest of the other international submarine cable systems land.

"I thank GO for their support and unwavering collaboration over these past months. We do believe that the La Valette cable system will result in a key project for Malta that will enhance the country's connectivity to the world with multiple routes thus creating new business opportunities nationally and internationally," added El Gazzar.

Sparkle enhances SD-WAN offering with network security capabilities

Sparkle has enhanced its software-defined wide area network (SD-WAN) solutions by adopting a multi-vendor approach. Sparkle's managed SD-WAN solutions provide hybrid, secure and low-latency connections globally, thanks to its global IP and fiber-optic backbone and worldwide presence as well as direct and secure access to major cloud providers.

On top of the SD-WAN MEF certification, Sparkle has successfully deployed an end-to-end secure access service edge (SASE) overlay across multiple SD-WANs. This demonstrates the company's ability to establish secure and effective remote employee access to company resources located in multiple clouds or on-premise.

Moreover, Sparkle sets itself as an end-to-end network service provider compared to other system integrators and technology vendors. The company is capable to orchestrate any complexity and provide a full-blown journey from traditional to software-defined WANs by offering a wide suite of professional services. These support customers in the design, implementation, and management of optimal SD-WAN solutions.

Sparkle's SD-WAN solutions are already utilized by several enterprises in the food, manufacturing, and energy sectors. Thus, these prove to be suitable for both national and multinational companies requiring hybrid, flexible and optimized network solutions to cope with dynamic application scenarios and high bandwidth traffic flows across multiple sites and workplaces in full security.

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Advantages of cloud-native technologies for telcos

Cloud technology is changing the way telecom operators function. Today's networks demand faster and more reliable access to a growing number of resources, applications, and services. The increasing data traffic trend has given way to virtualized mobile core networks instead of on-premise infrastructure even as the rapid rollout of 5G deployments is underway globally.

Indeed, Cloudification offers a great prospect to modernize IT infrastructure and gain operational efficiency through cloud-native design practices, DevOps, containers, and more. However, the transition to the cloud-native environment is not a straightforward one.

Enter telco cloud

Migration to the cloud involves overcoming a whole lot of challenges. However, an objective perspective on the common cloud migration challenges and tricky areas can help telcos better manage the shift to a cloud-native environment with telco cloud services that help operators achieve improved agility, flexibility, and scalability on their networks. But first, what are the gains from the implementation of telco cloud?

Under virtualized network core, the foremost advantage of telco cloud is that resources can be scaled up or out instantly which translates to massive savings in capital expenditure (CAPEX). In contrast, normally in a CapEx model,

IT can easily spend 80 % of the budget on equipment, leaving a small portion for innovation as maximum utilization must be planned for and provisioned, which is financially taxing.

Secondly, freedom from basic network and maintenance, hardware inventories, automation and elasticity, and space for innovation to make IT better to drive business value and growth are the hallmarks of telco cloud.

Cloud offers the Opex model that allows paying for use on-demand, meaning if the resources are not needed, they can be removed or deleted. Moreover, if operations fail, organizations need not sit on unused equipment and waste money as the Capex model involves a one-time purchase of equipment with many years of depreciation.

Cloud platform makes it easy to add new technological services and create new revenue streams. At a time when hyperscalers are eating up much of the communication service provider (CSPs) pie, being cloud-native savvy will help telcos to adjust to new requirements swiftly. With cloud technologies, telcos can launch and test new services in a matter of minutes rather than months accelerating innovation and being first to market.

The challenges remain

Legacy or monolith applications: Legacy operations involve manual intervention. This hinders quick response to immediate customer requirements to add new features as the entire single unit needs to be updated. It is also difficult to keep up with the rapid increase in operational activities that come with cloud and 5G's many devices, services, and slicing. Existing solutions are yet to be open and vendor-neutral. Monitoring, optimizing and modifying systems still require constant supervision.

Lack of vendors providing elasticity: While vendors can deliver some cloud-native applications, problems at the level of establishing genuine interoperability at the application level persist, requiring new integrations that could mean high operational expenses. Vendors need to advance the software architecture to make auto elasticity a reality.

Security in cloud architecture: Along with the benefits of cost-efficiency and improved agility, security lapses have become synonymous with virtualization and distributed cloud-based architecture. The flexibility to quickly create and ramp down applications from the data centers creates additional layers of security gaps.

4G/5G networks: Last but not the least, 4G and 5G are complex architectures to manage. A great amount of time and effort is lost in setting up, integrating, and upgrading the system.

Way to cloud-native network functions (CNFs)

Despite the challenges, telecom operators must find ways to explore the cloud and software ecosystem through careful planning, participation with upstream communities to learn about what to expect versus what is available in terms of CNFs. Relooking at the existing architectural constraint for a specific service and understanding how to build an end-to-end system architect using these components to achieve the delivery goal can greatly improve business and employee productivity, and the overall customer experience.

Virtual network functions (VNFs) have enabled the push towards cloud-native applications, however, upgrading VNFs is a slow process and scaling difficult as applications are transported into cloud environments using a "lift-and-shift" approach. In contrast, cloud-native applications address these setbacks using a microservices architecture that supports dynamic elasticity and scalability.

Microservices packaged into containers support the developers' ability to make changes to only a select group of microservices for a particular application. Developers can limit work and contain changes to microservices in a single container. Cloud-native applications promise dynamism with an ability to be changed easily and quickly by updating its microservices in containers and moving from cloud to cloud format with ease, as well as scale in or out fast. Telcos will have a lot to gain from CNFs to undergo cloud migration for their legacy applications.

Conversely, in recent developments, heavy-weight carriers such as AT&T Inc will run core parts of their 5G wireless network on Microsoft's cloud computing platform. The carrier's newer generation of networks is designed to rely more heavily on software and data centers for routing traffic rather than telecommunications-specific gear. Clearly, the tailwinds for the telcos to transition to a cloud-native environment are more than palpable already. TR

At a time when hyperscalers are eating up much of the communication service provider pie, being cloud-native savvy will help telcos to adjust to new requirements swiftly

Huawei and GAC build futuristic smart SUV to hit markets by 2023

Chinese tech giants Huawei and GAC Group will work together to develop a "smart SUV", aiming to hit the market in mass production by the end of 2023.

The two companies' first joint product is planned to be a medium- to large-size, pure electric SUV with a futuristic and powerful vision and efficient technology that will bring exciting new energy capabilities and Level 4 autonomous driving to buyers.

Huawei is a global leader in many types of technology and GAC Group embraces and encourages extensive technological innovation in its vehicles. This strategic cooperation will allow them to build a new generation of intelligent vehicles and digital platforms. This SUV and multiple other future models will utilize GAC's GEP.30 chassis platform and Huawei's CCA (computing and communication architecture), as well as carrying Huawei's full stack of intelligent vehicle solutions.

Since signing a strategic cooperation agreement in 2017, GAC and Huawei have worked together in the fields of intelligent connected electric vehicle technology.

In September 2020 in Guangzhou, the two firms signed an agreement to further deepen cooperation, with a focus on computing and communication architecture in accordance of the development trend towards software-heavy vehicles. In the last few years, GAC has seen significant success in realizing vehicle electrification and in various areas of new energy technology. GAC Group is highly committed to research and development, demonstrated by the billions of yuan funneled into the GAC R&D Centers across the world.

Given the intensifying campaign on the reduction of greenhouse gas (GHG) emissions, the global market for electric vehicles is only witnessing considerable growth. Recent market research data predicts that the EV global market will expand almost fivefold between 2016 and 2027; an annual increase of 20%. GAC Group is positioned to fully embrace this trend towards creating cleaner, greener, better cars, with GAC MOTOR aiming to produce an entirely electrified lineup of vehicles by 2025.

This rapid growth demonstrates a new demand in the automobile market for intelligent cars, and for Chinese craftsmanship.

With new technologies, new processes and new materials, as well as the use of intelligent manufacturing and comprehensively improved production capacity, Huawei and GAC aim to produce eight models and multiple series of cutting edge electric vehicles that provide a new driving experience at ever lower costs.

Nokia and Vodafone roll out new machine learning product for network anomalies detection

Nokia and Vodafone have launched a jointly developed machine learning (ML) product, running on Google Cloud, to quickly detect and remediate network anomalies before they impact Vodafone customers.

Based on Nokia Bell Labs technology and developed after a Nokia-Vodafone agreement signed in 2020, the Anomaly Detection Service product is being rolled out across Vodafone's pan-European network. The product quickly detects and troubleshoots irregularities, such as mobile site congestion and interference, and unexpected latency, which can impact customer service quality.

Following an initial deployment in Italy on more than 60,000 4G cells, Vodafone will extend the service to all its European markets by early 2022. Anomaly detection is offered "as-a-service," an important dimension to Nokia's Cloud and Network Services' business group strategy, and there are plans to eventually apply Anomaly Detection Service to Vodafone's 5G and core networks.

Vodafone expects that around 80 percent of all its anomalous mobile network issues and capacity demands will be automatically detected and addressed using Anomaly Detection Service.

Deployment on Google Cloud allows Vodafone engineers to make fast and informed decisions, like boosting capacity where customers need it most, based on data managed through Google Cloud's secure and reliable data and analytics services. On Google Cloud, Anomaly Detection Service allows the streaming of network data to Vodafone's data analytics platform, enabling analysis simultaneously of data across multi-vendor environments.

The Nokia-Vodafone deal signed last year complements Vodafone's recent six-year agreement with Google Cloud, also a Nokia partner, to jointly build integrated cloud-based capabilities backed by hubs of networking and software engineering expertise.

Huawei lands 4G licensing deal for Volkswagen cars

Huawei announced it has reached a license agreement with a supplier of Volkswagen Group The agreement includes a license under Huawei's 4G standard essential patents (SEPs), which covers Volkswagen vehicles equipped with wireless connectivity. This agreement marks Huawei's largest licensing deal in the automotive industry.

Song Liuping, Chief Legal Officer of Huawei, says: "As an innovative company, we own a leading patent portfolio for wireless technologies, which creates great value for the automotive industry. We are pleased that key players from the automotive industry recognize that value. We believe this license will benefit worldwide consumers with our advanced technology."

Huawei expects more than 30 million vehicles to be licensed under its patents based on existing license agreements.

Over the past 20 years, Huawei has entered into more than 100 patent license agreements with major global companies across Europe, the United States, Japan, and South Korea. Huawei will continue to bring digital connectivity to more vehicles globally to establish a fully connected, intelligent world.

Nokia's strong start to 2021 continued in the second quarter

According to published Q2 2021 results of Nokia, top-line strength continued in the second quarter, with constant currency net sales up 9% year-on-year, driven by growth across all business groups. Moreover, important progress was seen in line with the company's three-phased strategy where Mobile Networks strengthened its competitiveness with AirScale radio and baseband launch and Network Infrastructure continued to gain share in the first half with +20% sales growth in constant currency.

The company generated positive free cash flow for the fifth quarter in a row as well making its liquidity position solid with EUR 3.7 bln net cash. Considering its strong start to 2021, they revised the full-year 2021 outlook, including an increased net sales expectation of EUR 21.7 bln to 22.7 bln with a comparable operating margin in the range of 10-12%.

In Q2 2021, the reported net sales of EUR5.3 bln show a 9% increase on a constant currency basis. The Q2 2021 comparable gross margin was 42.3%, compared to 39.6% in Q2 2020. The improvement was positively impacted by the EUR 80 mln one-time software deal that was completed in Q2 2021, in addition to 5G growth, progress in cost competitiveness, and favorable product mix.

The Q2 2021 comparable operating profit was EUR 682 mln, or 12.8% of net sales, compared to EUR 423 mln, or 8.3% of net sales in Q2 2020. The improvement was primarily driven by higher gross profit and a net positive fluctuation in other income and expenses.

Mobile Networks net sales of EUR2.4 bln grew by 3% on a constant currency basis. This is primarily driven by strong growth in 5G, reportedly on track with key performance indicators (KPIs) such as ~70% ReefShark share by end of 2021, 4G/5G conversion rate at 90%, and 4G/5G market share of ~25-27% in full-year 2021.

Network Infrastructure net sales of EUR1.7 bln grew by 20% on a constant currency basis. This segment has grown across all four of its businesses (fixed, IP, optical, and submarine), with emphasis on the strong growth trend in Fixed Networks following the increased demand for fiber access technologies and broadband devices and the growth momentum in Submarine Networks as a result of continuous development of large submarine telecommunications projects.

Nokia Technologies net sales of EUR401 mln grew by 20% on a constant currency basis. This segment has shown strong growth, driven by higher patent licensing net sales related to both new and renewed patent license agreements signed this year and in Q4 2020.

Cloud and Network Services net sales of EUR703 mln grew by 2% on a constant currency basis, primarily driven by Core Networks and Enterprise Solutions. In Q2 2021, Nokia gained 63 new Enterprise customers and continued to have strong momentum in private wireless, now with more than 340 customers.

Huawei releases 2020 sustainability report

Huawei has released its 2020 Sustainability Report, which the company has been publishing annually for 13 consecutive years. The 2020 report explains the major progress that Huawei has made over the past year in its four strategies for sustainability: digital inclusion, security and trustworthiness, environmental protection, and a healthy and harmonious ecosystem.

In 2020, Huawei rolled out its Skills on Wheels and Connecting Schools programs in over 200 schools around the world, benefiting more than 60,000 people. Huawei also used ICT solutions to assist the pandemic response in the communities where it operates and provided technical assistance to nearly 90 countries, doing its best to support local communities in this time of great need.

In 2020, Huawei helped 22 protected areas in 18 countries manage natural resources and protect biodiversity more efficiently using its digital technologies. Huawei also launched the RuralStar Pro solution, which provides voice and mobile broadband services for sparsely populated remote villages. Its RuralStar solutions now provide network coverage for more than 50 million people in remote communities.

Prioritizing cyber security and privacy protection, in 2020, Huawei released the Software Process Trustworthiness Capability Framework and Assessment Criteria, establishing a complete set of trustworthy coding production mechanisms. As of the end of 2020, Huawei had been granted 2,963 patents relating to cyber security and privacy protection around the world. Last year, the company signed data processing agreements with more than 5,000 suppliers and performed extensive due diligence to ensure compliance.

Despite the pandemic and being on the Entity List, Huawei continued to ensure the smooth communications of more than three billion people worldwide and support network stability during more than 200 disasters and major incidents.

As part of its efforts to create a greener and more sustainable digital world, Huawei focuses on cutting carbon emissions, promoting renewable energy, and contributing to a circular economy. In 2020, Huawei's CO2 emissions per million RMB of sales revenue showed a 33.2% reduction compared to the base year (2012), beating the target (30%) the company set in 2016.

To promote renewable energy, Huawei has deployed its digital power solutions in more than 170 countries and regions, serving one third of the world's population. To date, these solutions have generated 325 billion kWh of electricity from renewable sources and saved 10 billion kWh of electricity. These efforts have resulted in a reduction of 160 million tons in CO2 emissions.

Qualcomm completes world's first 5G mmWave data connection

Qualcomm Technologies, Inc. achieved the milestone of completing the world's first 5G mmWave data connection. This was powered by the Snapdragon® X65 5G Modem-RF System, including new mmWave capabilities for global expansion with support for wider 200 MHz carrier bandwidth and enabling Standalone (SA) mode services over mmWave.

"This milestone supports and enables acceleration of 5G mmWave adoption, in anticipation of 5G mmWave rollouts in China, while enhancing coverage, power efficiency and performance for users, through the advanced features and capabilities of the Snapdragon X65," said Alberto Cicalini, senior director, product management, Qualcomm Europe, Inc. "These developments underscore Qualcomm Technologies' continued leadership in driving 5G mmWave commercialization and advancing 5G as we move through the next decade."

This breakthrough is made possible through the use of a smartphone form-factor test device powered by the company's flagship Snapdragon X65, and by utilizing Keysight Technologies' 5G Network Emulation Solution that leverages the company's UXM 5G Wireless Test Platform to flexibly support a wide range of spectrum band requirements.

Snapdragon X65 is Qualcomm Technologies' 4th generation 5G mmWave Modem-RF System for phones, mobile broadband, compute, XR, industrial IoT, 5G private networks, and fixed wireless access. Its software-upgradable architecture allows for enhancements and expandability across 5G segments which are key as 5G expands globally due to the rapid rollout of the new 3GPP Release 16 (5G phase 2) as well as the anticipated rollout of ultra-fast 5G mmWave in China and other regions.

In June, more than 40 global mobile industry leaders announced their commitment to support 5G mmWave, including China Unicom and major Chinese OEMs.

Nokia, Huawei lead $4B network automation software market

The global market for network automation software hits $4.36 billion in 2020, with Nokia and Huawei among the leading telecom vendors, according to a new Appledore Research report.

The Finnish vendor ended the year with a 17% share of the market with $758 million followed by Huawei with a 12% market share, recording $544 million in revenue. VMware had $379 million in revenue and a 9% market share, indicating a structural transformation within the market.

"The modernization, digitization, and cloudification of telecom networks over the last few years have not only resulted in a change to architectures and strategies. In our view, the telecom software market landscape itself has now been transformed," analysts said in a blog.

According to the report, the top three vendors from Finland, China, and the US accounted for about 38% of the market in 2020. On the other hand, second-tier players captured an aggregated 25% market share. This shows a relatively high percentage of involvement from other tech companies.

In the latest report, the network automation software market has been broken down into six categories for analysis. Dominating the market with almost 46% is domain management, which includes network-facing functions and near real-time controllers, valued at $2 billion in revenue.

This is followed by distributed cloud infrastructure management that generated $689 million last year, artificial intelligence for IT operations (AIOps) with $558 million, service orchestration with $509 million, network data management with $430 million, and component lifecycle management at $176 million.

The analysts believe that automation is the dominant business driver behind new spending on software. Network automation is an operational philosophy that CSPs must need to adapt to succeed and thrive. "CSPs must change metrics, incentives, organizational structures, and root out long-held assumptions and prejudices that are no longer true."

Qualcomm posts better-than-expected fiscal Q3 results

Qualcomm Incorporated announced results for its fiscal third quarter ended June 27, 2021.

The company's adjusted revenue was up 63% at $8.00 billion versus $7.58 billion as expected by analysts from the same period last year.

Earnings per share more than doubled annually in the quarter at $1.92 per share, adjusted, versus $1.68 per share as expected by analysts.

Adjusted Net income stood at $2.2 billion, an increase of 124%.

Qualcomm shares rose over 3% in extended trading.

The main driver for the growth was attributed to the company's chip sales. Qualcomm's QCT semiconductor business reported $6.47 billion in revenue, a 70% increase annually. Handset chip sales made up the bulk of that business, though it was also the slowest growing component. RF front-end was the fastest-growing QCT segment, up 114% annually to $957 million in sales as RF front-end chips being an essential part of 5G.

Qualcomm's IoT business, a part of QCT, which consists of low-powered chips to make other devices smart as well as networking and industrial uses, grew 83% to nearly $1.4 billion.

Commenting on the results, Cristiano Amon, president and CEO of Qualcomm Incorporated. "In addition to leading the 5G transition, we are on pace to deliver $10 billion of annual revenues across RF front-end, IoT and Automotive as our business continues to diversify. Our solutions are fueling the connected intelligent edge that is enabling the cloud economy, and we are seeing unprecedented demand for our technologies as the pace of digital transformation accelerates."

Looking ahead to its fiscal fourth quarter, the company expects revenue between $8.4 billion to $9.2 billion and adjusted earnings of $2.15 to $2.35 per share

Telecom Review webinar unravels IPv6 and IPv6+ growth and opportunities

Telecom Review, the Middle East's leading ICT media platform, under its parent company Trace Media International, organized a webinar titled 'IPv6 Enhanced Innovation: Paving the way for digital transformation in the Gulf Region' on August 3. This was the 2nd event for the IP industry that aimed to provide a fresh perspective into the transition from IPv4 to IPv6.

The virtual event featured keynote speeches from Sameer Ashfaq Malik, senior principal analyst, Omdia; Robin Li, IETF IAB member; Dr. Bilel Jamoussi, chief of the study groups department, ITU standardization bureau; Salma Sulaiti, head of standards & next-generation technology, the communications regulatory authority (CRA) of Qatar; Adeeb Al Braidi, general manager for internet services development, CITC; Sultan Mohammad Alsabhan, Zain Technology core general manager; Jamal Sahyoun, vice president/enterprise architecture & transformation, Etisalat; and Latif

Ladid, founder and president of IPv6 forum & chair of ETSI ISG IPE.

The moderator of the event, Toni Eid, Founder of Telecom Review and CEO of Trace Media, welcomed the panelists and urged the industry experts to share their business experience in the field of IPv6 deployment and adoption.

"Following last year's success and the positive impact that the first edition had, this year's edition focuses on national digital development and digital transformation in the Middle East and Gulf region, and will allow industry experts to share their business experience," he said.

IPv6 is the latest networking and interoperability medium for new technologies such as the Internet of Things, cloud computing, big data, 4G and 5G. In recent years, IPv6 impetus in the industry has witnessed an unprecedented surge where IPv6 commercial deployments have been adopted across business verticals because of cost efficiency, simplicity, increased security, and opening new pathways to innovation in networked information systems. IPv6-only networks infrastructure has entered into mobile networks, data centers and enterprise networks. To keep pace and capitalize on the industry trends, governments need to facilitate the expansion and ease of deployment of IPv6.

The speakers discussed the best practices that can be widely adopted to facilitate the deployment of IPv6. Different strategies, tools, processes and communication methods to enhance the cooperative engagement between various stakeholders were also discussed at length. The industry experts explored as well the creation and identification of new opportunities in the field of IPv6 and IPv6+.

The speakers addressed the following topics:

- Advancing the digital economy with IPv6 and IPv6+
- Building an IPv6+ innovation system to facilitate digital transformation
- IPv6 implementation experience
- IPv6+ industry practice sharing
- Accelerating IPv6 innovation and crossing the digital divide

The recurring recommendations from the speakers was the need to create an ecosystem for IPv6 and IPv6+ adoption and deployment within the business strategy across industries through policy, industry-know-how and leadership engagement.

Addressing the first keynote on 'Advancing the digital economy with IPv6 and IPv6", Sameer Ashfaq Malik, senior principal analyst, OMDIA said their research has shown that the digital economy is important in boosting the GDP of an economy.

He said, "Economies are moving towards digitalization and digital economy is one of the drivers for boosting the GDP all over the world. We have found in our analysis that full end-to-end connectivity

for automation in industries will contribute to the economy. IPv6 is well suited to the new demands of 5G and cloud era."

Shedding light on the evolution of IPv6, Robin Li, IETF IAB member, covered the topic 'IPv6+ industry development.' He stressed that the advancement in 5G and cloud technology will keep driving change for the IP network architecture. He added that traditional VPN services will not meet the requirements of network slicing that 5G enables. "There will be more IPv6 class innovation and deployments in the future," he added.

Adding to the conversation with his notes on 'Building an IPv6+ innovation system to facilitate digital transformation', Dr. Bilel Jamoussi, chief of the study groups department, ITU Standardization Bureau, said, "Countries that had exhausted their IPv4 need to transition quickly and move to IPv6. We cannot underestimate the importance and the urgency of the transition from IPv4 to IPv6, and having the basic instruments in the government and countries in terms of the lab, capacity building, and policies to adopt IPv6+. All these new innovative applications are emerging and the transition and growth of the IPv6+, building on top of the basic IPv6 technology must be part of the strategy."

Sharing her experience in laying the foundation for IPv6 in Qatar, Salma Sulaiti, head of standards & next-generation technology, the communications regulatory authority (CRA) of Qatar covered the topic of 'Driving IPv6 deployment: Lessons learned.' Salma opined that IPv6 adoption was inevitable and that regulators had a key role throughout the transition from IPv4 toIPV6.

"To activate the IPv6 strategy in Qatar, CRA established an IPv6 task force consisting of several dedicated key stakeholders from the government and private sectors as it was important to ensure that all the key members were available and connected to support each other through this journey. The primary role for the Qatar national IPv6 task force was to advocate, educate, and promote ipv6 across the country," she said.

"A continuous test with trials and pilot projects is essential to achieve success. I wouldn't deny that there were some setbacks, but to move forward, we needed to get ourselves comfortable throughout this journey, as a whole ecosystem," she stressed.

Covering the topic 'Digital regulator accelerating the growth of the Kingdom's digital transformation', Adeeb Al Braidi, general manager for internet services development, CITC, spoke about the role of IPv6 in digital transformation and the experiences and milestones implemented in Saudi Arabia for IPv6 adoption.

"CITC set up the national IPv6 implementation strategy back in 2010 based on three major objectives. The first one was to prepare for IPv4 depletion and transition to the IPv6 division to ensure business continuity and internet users' growth. Secondly was to make the transitions smooth and minimize the risks. And lastly, to raise the awareness at the national level among all stakeholders, private and public sectors about the importance of IPv6."

He said that the strategy has organically emerged in three phases. "The first phase has been focused on the readiness of service providers and national services. The second phase focused on enterprises and business consumers and lastly, our major focus was on end-users and mobile devices which are very important to Saudi as the majority of our internet users are connecting to the internet from mobile," he explained. "The current status for IPv6 deployment is that almost 45% of our users are on IPv6 and Saudi Arabia is in the top 10 nations in the global ranking for ipv6," he concluded.

Sultan Mohammad Alsabhan, Zain technology core general manager, covered the topic of 'IPv6+, gearing the 5G network development.' "Combined IPv6+ and 5G will guarantee end-to-end service experience. It will enhance and support 5G features services scenario," he said.

Talking about Zain's IPv6 activation in Saudi Arabia, he said that all Zain subscribers are enabled to use IPv6, including mobile, broadband and 5G. He also added that more than 50% of subscribers are IPv6 active/assigned.

Jamal Sahyoun, vice president/ enterprise architecture & transformation, Etisalat, covering the topic 'Accelerating value generation through innovation and digitization, said, "Beyond the IPv6, we should look from an IT perspective at how to work very closely with our customers to enable the benefit that IPv6 will have on the massive connectivity of the applicable use cases into the future."

The last speaker for the webinar was Latif Ladid, founder and president of IPv6 forum & chair of ETSI ISG IPE, who tackled the topic 'Accelerating IPv6 innovation and crossing the digital divide.' He said that the IPv6 Forum's target was to establish an IPv6-only network to facilitate IP address space, better network control, the addition of new functions and to reduce CAPEX and OPEX in running networks.

To stress his point better, he cited an analogy of flight services whereby he said that IPv6 can give user-experience from the economy class to a business class and likened IPv6 to a business class and IPv6-only as first class. He said that the 1.5 billion IPv6 users minus the 435 million of China already comprise 44.7% of global IPv6 adopters. He also stressed the importance of IPv6 to enable blockchain technology as part of the global transition to smart technologies.

The webinar concluded with a poll voting that clearly showed how the industry is heading towards larger IPv6 adoption. An interactive Q&A session at the end allowed the participants to interact with the speakers. TR

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PCCW Global, DIDWW to expand voice service coverage in Europe-Asia

Leading international telecom service provider PCCW Global and premium two-way VoIP communications services provider DIDWW have collaborated to expand SIP trunking service coverage in the European and Asian regions.

Businesses around the world have been migrating from traditional public switched telephone networks (PSTN) to IP-based SIP voice platforms that connect their regional offices to more advanced infrastructure. This provides them with more flexible inter-office communications as well as better security and management.

Mrs. Lina Zaboras, CEO of DIDWW, said, "We maintain a leading position in the markets of Europe and the Americas with our broad service offerings and extensive coverage of virtual phone numbers. We are pleased to form this collaboration with PCCW Global and believe it will further strengthen our ability to provide IP-based interconnection for reliable voice services in the Asia-Pacific region."

DIDWW enables the migration to IP and PSTN replacement arrangements by providing high-quality and powerful two-way SIP trunking service packages in global locations. Both carriers and multinational enterprises leverage these solutions. More so, the collaboration between PCCW Global and DIDWW will create new opportunities by leveraging PCCW Global's unparalleled infrastructure in the Asia-Pacific region and DIDWW's advanced services and global coverage in Europe and other parts of the world.

Nokia secures first 5G contract in China

Nokia secured a 5G RAN contract for China Mobile on Monday, making this the company's first 5G contract in the country.

Nokia was awarded a 10% share in one of three contracts tendered by China Mobile, while Ericsson obtained 9.6% of another contract. The total tender for all three contracts reached about $6 billion, with Nokia being awarded 4% of the overall tender. Comparatively, Ericsson was awarded 2%, dropping from about 11% last year. Together, Huawei and ZTE won the majority share in all three contracts to build 5G 700 MHz base stations for China Mobile and China Broadcasting Network. This is followed by a smaller local company Datang Corporation.

China Telecom and China Unicom will also be disclosing awards of their respective 5G contracts.

Currently, China is ahead of other countries in 5G deployments. According to data from the Ministry of Industry and Information Technology, China had deployed 820,000 5G base stations by the end of March.

MEF 3.0 Certification empowering enterprise digital transformation

MEF announced several milestones for its MEF 3.0 certifications, fueled by the need for validated services, technologies, and professionals to help enable enterprise digital transformation. More than sixty service providers and technology vendors around the globe now offer MEF 3.0-certified Carrier Ethernet (CE) and SD-WAN solutions.

Four of the top five companies as ranked on Vertical Systems Group's 2020 U.S. Carrier Managed SD-WAN Leaderboard—AT&T, Verizon, Comcast Business, and Windstream—have achieved MEF 3.0 SD-WAN Certification. In addition, the top four SD-WAN technology providers as ranked by Dell'Oro Group—Cisco, VMware, Fortinet, and Versa—have attained MEF 3.0 SD-WAN Certification.

Thirty-six service providers to date have achieved MEF 3.0 CE Certification, including four of the top six as ranked on Vertical Systems Group's 2020 Global Provider Carrier Ethernet Leaderboard—Orange Business Services, Lumen, Verizon, and BT. Driven by the network transformation taking shape in the industry to enable new digital services, MEF experienced a 75% annual growth rate in its MEF 3.0 services certifications, which includes SD-WAN and CE. In addition, 7,500 individuals in 85 countries from over 400 employer organizations have earned their MEF professional certifications in SD-WAN, SDN/NFV, and CE.

"This momentum signals that the industry continues to recognize the value of our certifications to ensure simplified, pre-validated functionality for buyers, and frictionless implementation and partnering within the MEF ecosystem," said Nan Chen, president, MEF. "During this time of tremendous digital transformation taking place in enterprises, MEF 3.0 certified services and technologies are proven to conform to MEF's meticulous specifications for performance, assurance, and agility. Customers that purchase these services can have confidence that they meet the industry's highest standards. We applaud all of the companies and professionals that have worked diligently to achieve their MEF 3.0 certifications."

Adding to MEF's triad of certifications for services, technologies, and professionals, a forthcoming MEF LSO API certification will offer companies the opportunity to validate that their MEF LSO Sonata and Cantata APIs conform to use case and business requirement specifications established by the industry's defining authority for standardized, automated network-based services. As part of a pilot program, three service providers—Sparkle, TIME dotCom, and UFINET—are now LSO Sonata-certified for automated ordering of CE Access E-Line services.

TELUS' mobile network ranked as fastest in Canada

TELUS has earned the top spot in Ookla's 2021 Fastest Mobile Network Speedtest Awards for the fifth year in a row. This shows the operator's superior network speed and strength across the country as Canadians continue to rely on network connectivity throughout the pandemic.

"More than ever, Canadians value a fast, reliable connection, and the consistent recognition from independent, third-party organizations, such as US-based Ookla, reinforces the superiority of TELUS' world-leading mobile network," said Darren Entwistle, president and CEO, TELUS. "For the fifth year in a row, Ookla has ranked TELUS' mobile network as number one in Canada, as our team, including our engineers and network innovators, work diligently to keep Canadians connected to the people and information that matter most."

TELUS has been awarded as Fastest Mobile Provider in Canada, having a speed score of 85.21 MBps, with median download speeds of 76.42 Mbps and median upload speeds of 8.01 Mbps. This latest recognition from Ookla adds to the numerous accolades the company has earned over the years including those from Opensignal, JD Power, Tutela, and PCMag. As a result, TELUS is building an outstanding record of achievement with respect to network superiority, both of urban and rural coverage.

"We are extremely proud of the many ways in which our mobile network, with its global-best speeds, is facilitating critical, transformational change in respect of health, education, teleworking, the environment, and the economy. Perhaps most importantly, our world-leading networks are helping to bridge digital divides so that every member of our society has the opportunity to realize their full potential," Entwistle added.

South Sudan launches first local telecom operator

Joining South Africa's MTN and Kuwait's Zain in South Sudan's telecom market is the newly-launched Digitel Network, the first domestically-owned telecom operation in the country. Its inauguration ceremony was led by President Salva Kiir Mayardiit with the aim to bring mobile connectivity to remote areas across the country.

Highlighting that the country lagged badly behind the rest of the world when it came to digitalization, Mayardiit is considering tax exemptions for the new company to help support rural communities. "To demonstrate seriousness in the desire to connect rural communities to mobile networks, the government will explore options, including tax exemption that will benefit importation of network equipment and other telecommunications tools," he said. "This equipment will help increase digital literacy programs for the next generation ICT-driven economy. The tax exemption I am proposing will be done in collaboration with the national revenue authority to ensure modalities for tax exemption are consistent with its mandate."

The launch of the new telco is due to the government's partnership with the private sector. "The installation of mobile service infrastructure is an ongoing process. Recently, people in Maper, Rumbek North County, and Pochalla in the Greater Pibor Administrative Area have been connected to a mobile network," Mayardiit remarked.

According to the president, in three weeks' time, Boma in the Greater Pibor Administrative area and Kuron Peace Village in Kapoeta East County will also be connected to the mobile network.

Orange expresses interest in Ethio Telecom

A tweet by Henok Teferra Shawl, Ethiopia's ambassador to Paris, announced Orange's interest for a stake in Ethio Telecom. The operator had "formally submitted interest to participate in the partial privatization of Ethio Telecom."

Ethiopia had launched a tendering process to sell a 40% stake in the state-owned telecom operator Ethio Telecom to private investors as part of the government's plan to open up the country's telecoms sector and economy.

In May, The Global Partnership for Ethiopia, an international consortium composed of Vodafone Group, Vodacom Group, Safaricom, Sumitomo Corporation, the UK CDC Group, the US Development Finance Corporation (DFC), and supported by 75 local companies, won a new telecommunications license in Ethiopia.

The consortium aims to establish an operator which will compete with the incumbent Ethio Telecom to serve 112 million customers, putting an end to a monopoly of 126 years.

Various concerns have arisen regarding the geopolitical context of the decision. The Ethiopian government selected the Global Partnership for Ethiopia (GPE) after showing the upper hand against MTN Group. The former made an $850 million bid for the license, with the latter offering a bid of $250 million lower. Despite going through a transparent and fair process, the decision faced criticism due to the players involved in the licensing competition.

Digitizing the capacity industry

The wholesale industry is a key to the telecommunications cycle. Telecom Review will highlight the importance of wholesale services in its upcoming virtual panel.

Place: virtual

5 OCTOBER

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GITEX features a grand showcase of technology from big tech companies to government entities to next generation startups. The latest trends and discoveries in 5G, AI & analytics, future mobility, digital economies, cybersecurity, fintech, cloud & edge and more.

Place: Dubai World Trade Center, Dubai, UAE

17 - 21 OCTOBER

Cabsat

Cabsat, the MENA region's most competitive event for the satellite, broadcast and filmed content industry, will showcase ground breaking innovation and powerful solutions for professionals looking to create, manage, deliver and monetize content on any platform.

Place: Dubai World Trade Center, Dubai, UAE

26 - 28 OCTOBER

Telecom Review Leaders' Summit 2021

The 15th edition of the leading ICT gathering will be held in a hybrid mode where the latest industry trends will be tackled.

Place: InterContinental Dubai Festival City and virtual

8 DECEMBER

Latest updates on:
www.telecomreview.com

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