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FIFA World Cup™**

How **Hyperautomation**
Will Transform CSPs

On the World Wide
Web, **It's a Must to
Be Cyber Smart**

**Miniaturization on
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Toni Eid,
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Open RAN Again!

Why does the Open RAN debate continue? When the hype of the Open RAN technology began over three years ago, Telecom Review was keen to highlight its good and bad sides. And yet this debate is being raised once again.

As several years have passed on several Open RAN deployments, telecom operators have learned their lesson that Open RAN may save money, but it's not the smoothest path to take!

Why? Because such operators have compromised their security for the sake of savings, whether CAPEX or OPEX. There are many stories to tell, particularly with multiple vendors getting involved with Open RAN. Few of the operators are willing to admit to issues such as the security of networks causing delays or crashes, concerns over financial transactions, conflicts between hardware and software suppliers and content issues.

As a result, there are threats to a multitude of services in many locations, from North America to the Middle East and Asia, where there is minimum Open RAN implementation.

The single RAN may cost you more, but at least you can hold someone responsible on their end and ask them to fix any problems that arise.

I'm looking forward to the MWC 2023, which will re-emphasize the Open RAN debates, revealing which side operators take and their best assurances of being cost-effective without compromising technology.

I hope that we will look at the issues of Open RAN not only from the cost side but also with examples of concerns that most stakeholders have been able to avoid until now.

It's time to discover if Open RAN is providing more opportunities or more challenges to the telecom industry today.



Sheikh Ali Bin Jabor Al Thani, CEO, Ooredoo Qatar

Ooredoo Powers First-Ever 5G-Enabled FIFA World Cup™

As the Official Middle East & Africa Telecommunications Operator of FIFA World Cup Qatar 2022™, Ooredoo has shattered world records, delivered phenomenal connectivity and wowed the world with the first-ever 5G-powered FIFA World Cup.

In an exclusive interview with Telecom Review, the newly-appointed Ooredoo Qatar CEO, Sheikh Ali Bin Jabor Al Thani, shared how the company, as a leading telecom operator, will continue to deliver connectivity to new heights and how the mega sporting event was a significant step on the journey towards achieving Qatar's goal of becoming a truly advanced nation.

Congratulations on being appointed as the new Ooredoo Qatar CEO. What does this role entail for you, and what are your motivations moving forward?

I have to say I am both very proud and humbled by the huge responsibility with which Ooredoo's leadership has entrusted me. I am also lucky to have inherited this position from a very successful predecessor, Sheikh Mohammed Bin Abdulla Al Thani, who successfully led Ooredoo Qatar for three years. Sheikh Mohammed steadfastly steered the company through the challenges of the pandemic and on to some of our greatest successes, including our record-breaking performance during FIFA World Cup Qatar 2022™.

Now it's my responsibility to build on the strong foundations put in place by my predecessors and to enable the company to continue to innovate and drive value creation in our home market of Qatar.

As I now lead the company's strategic direction and oversee its operations, my focus will be on achieving our very ambitious business goals and delivering value to all stakeholders, in line with Ooredoo's vision of enriching people's digital lives and its goal of upgrading its customers' worlds.

As a market leader in Qatar, our responsibility is to ensure that Ooredoo consistently drives innovation, leveraging new technologies to stay ahead of the competitive curve.

To maintain this market leadership, we will continue to seek new partnerships with governmental institutions and leading technology companies – and strengthen existing ones – to drive digital transformation across various industries and sectors. This will enable us to continuously upgrade our suite of mobile and fixed connectivity solutions that are transforming our customers' daily digital experiences and upgrading the way they work and communicate.

Internally, Ooredoo's aim is to maintain our position as an employer of choice in Qatar, so our focus will remain on evolving into a more agile, team-focused corporate culture, as well as on attracting and retaining top talent; investing in young leaders; and fostering a supportive, inclusive work environment that ensures the wellbeing of all employees.

Ooredoo announced record-breaking figures at the conclusion of FIFA World Cup Qatar 2022™. How does this influence a telco's strategy for delivering industry-leading communications and connectivity? Will you be powering any other major events with 5G soon?

We couldn't be any prouder of what Ooredoo has achieved as the Official Middle East & Africa Telecommunications Operator of FIFA World Cup Qatar 2022™.

Ooredoo has shattered world records, delivered phenomenal connectivity and wowed the world with the first-ever 5G-powered FIFA World Cup. Our opening ceremony data traffic exceeded that of the Super Bowl, and the records set at the opening



ceremony were broken by the time the tournament concluded.

For example, the breathtaking final between Argentina and France at Lusail Stadium saw a record-breaking 45.1 TB of data used; 8.4 TB of stadium Wi-Fi used; more than 650,000 calls made; and 32,000 fans using roaming.

Indeed, Ooredoo has presented a phenomenal display of what will surely now be seen as industry-standard communications and connectivity for such major global events.

These record-breaking figures solidly indicate that the company's strategy for delivering industry-leading communications and connectivity has been undeniably successful.

This success encourages us to continue our strategic investment in cutting-edge technologies like 5G and 5G use cases, as well as network expansion, which can enable the delivery of transformational digital experiences for users and further drive innovation, development and expansion in the telecommunications industry.

In its network modernization and expansion journey, Ooredoo has taken a holistic approach that prioritizes technology, reliability, digital inclusion and sustainability. This approach ensures that everyone remains connected and that our investments in our network are sustainable for the long run.

That said, we will certainly be powering other major events with 5G, leveraging the advancements we have made to create ever more upgraded experiences for users and take the way they experience connectivity to new heights.



Ooredoo consistently drives innovation, leveraging new technologies to stay ahead of the competitive curve





During the mega sporting event, what was the importance of providing a 24/7, fully immersive experience to fans, customers and broadcasters? How did they benefit from Ooredoo Qatar's network modernization?

FIFA World Cup Qatar 2022™ provided us the greatest opportunity that a host country can have to showcase its capabilities and deliver an entirely memorable experience for fans, customers and broadcasters.

A sporting event of this caliber, held in the 5G era, comes with great expectations and responsibilities: high-speed, low latency, reliable and seamless connectivity to enable fans to stay connected and share their experiences, as well as the capability for broadcasters to deliver high-quality live content to a global audience.

I can confidently say that, as the Official Middle East & Africa Telecommunications Operator of FIFA

World Cup Qatar 2022™, we exceeded expectations and lived up to our responsibilities.

Ooredoo Qatar's network modernization, which included upgrading our 4G LTE network and widely deploying 5G and advanced technologies, played a key role in meeting these demands and delivering the best-ever experience. Let me give you some key facts of what was done:

Proper network capacity and resiliency throughout all network components — RAN, Core and Transport — was ensured for both national and international segments, and included full modernization of the core, with a sophisticated cloud core network in state-of-the-art data centers.

A major upgrade of outdoor radio sites with the latest 5G technology

maximized country-level coverage, including stadiums, airports, rail networks, fan zones and other FIFA-related facilities. Capacity for fan zones and other event venues and hotspots was enhanced.

More than 1,130 multi-beam antennas connected over 355 km of RF cables and over 202 km of fiber optic, covering the eight stadiums and immediate surrounding areas with 4G and 5G. Mobile network services with 5,000+ cells, 1,500+ DOTs, TETRA services and a Wi-Fi backbone offered state-of-the-art 5G, 4G, 3G and 2G technologies at all eight stadiums.

Network enhancements also included upgrades of Ooredoo's National and International Transport IP links capacity, ensuring abundant bandwidth for internet connectivity with international servers for popular OTT applications such as Facebook,

11.4 MILLION VOICE CALLS



Instagram, Snapchat, TikTok, WhatsApp and more. These upgrades also ensured the provision of high-quality voice calls and an excellent roaming experience, enabling customers and broadcasters to stay connected with their international home destinations.

What's more, customer experience measurement devices were deployed in stadiums and fan zones to monitor in real-time the main applications being used by fans and enable proactive real-time quality enhancements.

By offering a robust and reliable network, we were able to support high-bandwidth applications like live streaming, real-time data transmission and video calls, enabling fans and customers to stay connected and engaged with the action from anywhere in the world and enjoy an upgraded, fully

immersive experience provided by our innovative solutions.

All these efforts enabled Ooredoo Qatar to deliver a once-in-a-lifetime world-class experience to customers, visitors and fans. Our performance also reinforced Qatar's reputation as a leader in technology and innovation.

Qatar aims to be a truly advanced nation. What is the telecom industry's role in achieving this goal, and how did the first-ever 5G-powered FIFA World Cup help accomplish this?

Holding a mega-event, and in this case, the FIFA World Cup Qatar 2022™, is a powerful motivator for the host country to rapidly advance in areas such as infrastructure, tourism and economic development.

The telecommunications industry features as an integral part in achieving this advancement and

plays a critical role in helping Qatar become a truly advanced nation, as it provides the backbone for many key technologies and services that are necessary for a modern, connected, knowledge-based society.

The first-ever 5G-powered FIFA World Cup Qatar 2022™ was a significant step on the journey towards achieving the goal of becoming a truly advanced nation, as it demonstrated the capabilities of 5G technology and its potential to transform the way people live, work and even play.

With its high-speed internet and modern telecommunications infrastructure, Ooredoo was able to support innovation in many areas such as healthcare, education, sports and commerce, among others.

The deployment of our 5G during the event showed the world that Qatar



is at the forefront of technology and innovation and is committed to leveraging advanced communications to enhance the quality of life for its residents and visitors.

Ooredoo's 5G network provided high-speed, low-latency, reliable connectivity that enabled fans, customers and broadcasters to experience the event in real-time with high-quality video, virtual reality and augmented reality applications.

This helped showcase the potential of 5G to revolutionize the world we live in and set the stage for continued innovation and development in the future.

Without dedicated manpower, FIFA wouldn't have been a success. How does Ooredoo Qatar build such a highly skilled, diverse and integral workforce while promoting an inclusive and innovative work environment?

Key pillars of Ooredoo's corporate strategy are "Excellence in Customer Experience" and "People," and both these pillars are closely connected, as succeeding in customer experience requires an engaged and empowered workforce.

In this context, we are advancing our ways of working by increasingly adopting agile methods, fostering cross-functional collaboration and driving personal ownership of outcomes and respective empowerment.

We measure and benchmark the engagement of our workforce and have managed to achieve very strong results as an outcome of numerous initiatives.

Indeed, a crucial aspect of Ooredoo Qatar's success is building a highly skilled, diverse and integrated workforce. But not only that; we are also building a workforce that is motivated, engaged and committed to delivering high-quality services and solutions to its customers.

We achieve this through talent acquisition via a robust recruitment process that attracts the best talent from Qatar and around the world, providing opportunities for individuals with a wide range of backgrounds and experiences to join the company.

This talent is retained through our employee engagement effort, which fosters a positive and supportive work culture and helps us to retain top talent and create a motivated, innovative and productive workforce.

We also have training and professional development programs designed to upskill and reskill employees, helping them build the skills they need to excel in their careers. Coaching and mentoring underpin this daily work to help people to grow with Ooredoo and contribute meaningfully to our business.

Another important element of our success is the promotion of a diverse and inclusive work environment that values and embraces differences,

providing equal opportunities for all employees, regardless of their race, gender, religion or background.

Going forward, our People strategy will focus on deploying strategic workforce planning in line with our Smart Telco business model, developing a strong pool of highly skilled talents and a solid talent bench.

As one of the most valuable and strongest of Qatari brands, how can Ooredoo Qatar continue to solidify and build on its reputation?

As the leading telecommunications provider in Qatar, Ooredoo has a solid foundation on which to continue building, strengthening its position and maintaining its competitive edge in the industry.

Meeting the ever-changing digital needs of our customers, delivering high-quality services, excelling in customer experience and building strategic partnerships are all vital elements that enable Ooredoo to stay ahead of the curve.

We continue to invest in research and development to bring innovative and cutting-edge products and services to the Qatari market.

We tirelessly address our customers' concerns promptly and efficiently to deliver a positive customer experience and retain our customers' loyalty to the brand.

And, in forming strategic partnerships with global tech giants, we are able to leverage their expertise and resources to upgrade our offerings.

Finally, as a forward-thinking company, Ooredoo is increasingly taking a leadership role in Qatar's drive to create sustainability and its commitment to socially responsible investing.

Under its new leadership, what are Ooredoo Qatar's core objectives in 2023?

Ooredoo's competitive strategy, strong leadership and continued investment in network modernization and expansion drove positive momentum



that resulted in our solid position in 2022. We drew key lessons from last year that will inform and support the evolution of our strategy, with prioritizing customer experience as a key focus.

In increasingly competitive markets, our aim in 2023 is to create superior customer experiences and inspiring moments for our customers, an approach we see resulting in heightened levels of loyalty and higher spend with Ooredoo.

We will continue to invest in upgrading and expanding our network to meet the increasing demand of our consumer and business customers for data and connectivity. 5G and its myriad use cases will remain a key driver of the company's ongoing success as it adopts the latest technologies.

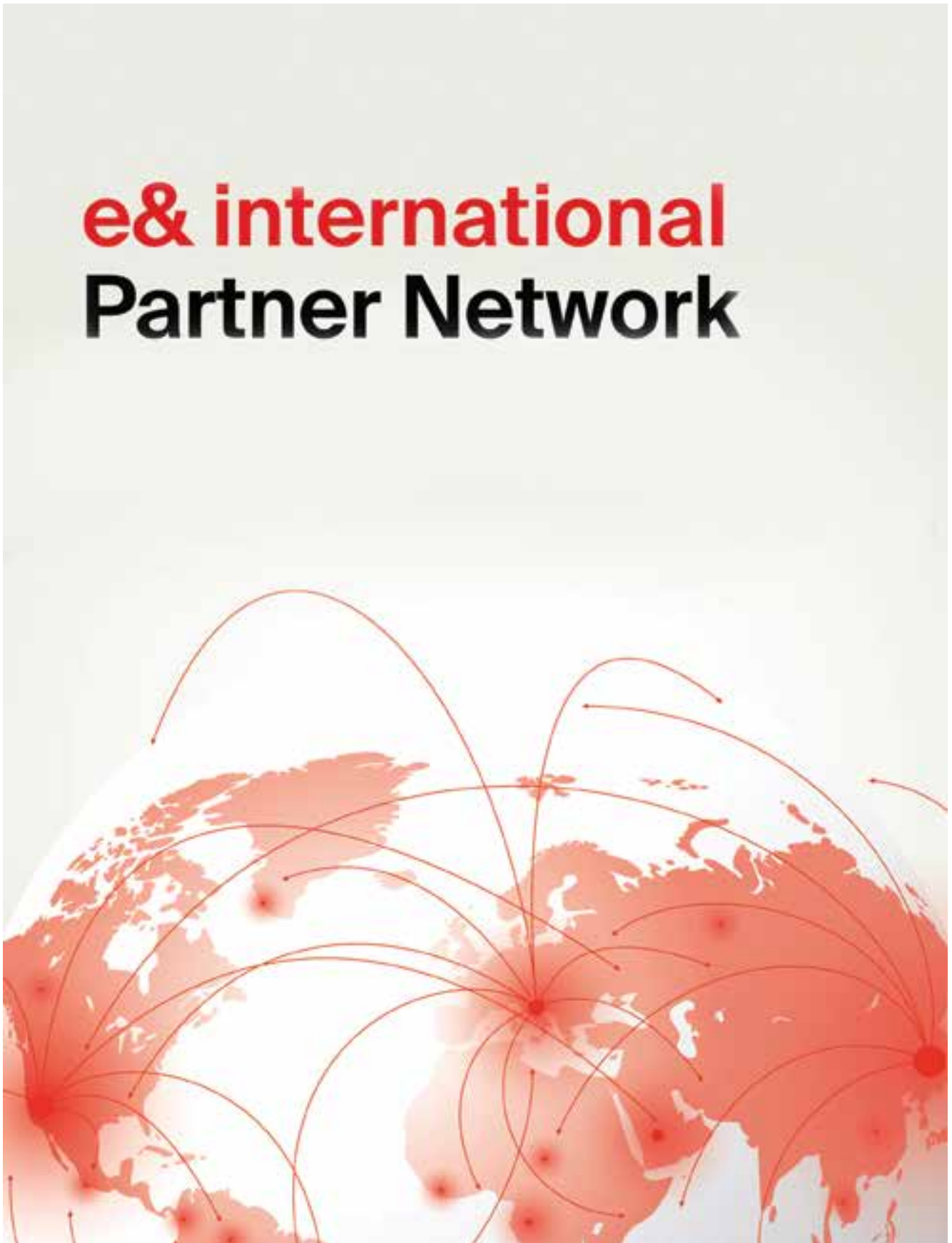
With significantly increased network capacity and the introduction of edge computing, our high-speed, low-latency 5G network will enable us to deploy more IoT devices and AI applications – which have the potential to greatly enhance people's digital lives by simplifying daily tasks and creating personalized experiences. **TR**



Ooredoo has shattered world records as the first-ever 5G-powered FIFA World Cup concludes, with the opening ceremony's data traffic exceeding that of the Super Bowl



e& international Partner Network



e& international Launches 'e& partner networks'

e& international has announced the launch of its new business program, "e& partner networks," leveraging e&'s position as one of the world's leading telecom providers to support telecom operating companies in regional markets.

Capitalizing on the Group's continued growth in international markets, with over 162 million subscribers in 16 countries, the program invites independent telecom operating companies from around the world to partner with e&.

Partners will benefit from e&'s superior expertise across a range of business verticals, with a focus on adding meaningful and measurable top- and bottom-line business impact.

Mikhail Gerchuk, chief executive officer of e& International, said, "The world has opened up to opportunity again, allowing us to adopt a resilient business growth mindset, create a future-ready operating model and focus on value creation. Our strategic partnerships remain one of our key priorities, and through the 'e& partner networks,' we will be able to strengthen these partnerships.

"The scale of the opportunity available to us through the 'e& partner networks' is enormous. With e& international at the forefront of the new strategy, 'e& partner networks' will be able to leverage the privilege of the e& brand and benefit from a value-added engagement with telecoms-related business objectives.


"e& can support these independent partners who currently may be facing challenges in terms of matching the scale and expertise of their competitors,

talent recruitment and high operating costs. Together, we can create a business proposition for consistent growth with value-added benefits from operational savings and uplifting topline revenue growth for our partners."

Meanwhile, Obaid Bokisha, group chief operating officer of e&, said, "As a trusted industry leader with decades of experience, we understand the importance of reliable and efficient networks for connecting communities and driving economic growth. Through this program, we are looking forward to working with telecom operators across markets and empowering them with the resources and expertise necessary to drive sustainable development and enhance customer experiences."

The program will support operators in customer engagement and value management; sales channels and customer experience; pricing and proposition support; Artificial Intelligence and Machine Learning modelling; international carrier and wholesale channels; network procurement and overall Capex and Opex optimization; and digital and mobile finance services, as well as many other opportunities.

Each partner will be allocated the necessary resources and additional staff. Selected teams from e& international will be seconded to the offices for future support and close collaboration with the partner's management team.

e&'s partner networks will enable e& international to share e&'s cutting-edge expertise and apply e&'s best practices, tools and models to a wider customer base in new geographic markets. 



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Ismail Mohamed, CEO, Newroz Holding

Newroz Holding: Aligning With Global Market Shifts by Being a DSP

Fast, reliable and affordable connectivity is the cornerstone of developing a modern economy. It allows governments and citizens to engage more meaningfully while enabling businesses to thrive in tough economic conditions. Newroz Holding understands this and, in line with the Kurdistan region of Iraq's Vision 2025, is investing in new technologies to achieve these economic goals.

In an exclusive interview with Telecom Review, Ismail Mohamed, CEO of Newroz Holding, which launched Fastlink Telecom to provide superior services, outlines how far the company has come and its vision for the future.

Tell us a bit more about the history of Newroz Holding.

Newroz Holding was founded in 2007, and in 2013, the company launched Fastlink, a popular brand for the first 4G network in the region. Newroz Holding continues to use strategic global partnerships to deliver on

our vision to be the leading provider and communications pioneer in the region. It is our goal to build state-of-the-art telecommunications infrastructure to improve the lives of our customers and deliver a wide range of carrier services. This strategy is centered around our

customers' needs and ambitions to help support their growth and help them maximize their profits. Today, we have more than 1,000 business and technical employees, making Newroz Holding the largest company of its kind in the region. And this helps us continue supporting our community by making a positive contribution to economic, environmental and social progress.

How has the company evolved over the past years, and what has been the reason for this evolution?

Globally, the telecommunications market is shifting, and for operators to remain relevant as markets change, they need to evolve as well. As Newroz Holding, we have recognized this need to evolve along with changing markets, and that is why we are prioritizing the shift from ISP to Digital Service Provider (DSP) to remain aligned with global market shifts.

There are several areas that are critical to keep in mind during this shift in strategy. Firstly, we must always maintain network service quality. For us to help governments and citizens, maintaining a minimum level of strength and quality of service for our customers is critical. The second area is making strides in the dispersal of open data, and the third is to ensure that we put the technology in place to support economic recovery and ensure business resilience in a changing environment. Connectivity has become crucial to everyday life, and it is our goal to ensure that we play a fundamental role in this. This is where strategic partnerships with global leaders such as Nokia are instrumental across different domains, from IP infrastructure (the first 400G introduction in Iraq in 2021) and improving the 4G network, to being the fastest broadband in KRG.

Newroz Holding has developed a great interaction with the health infrastructure system by providing Fast Care platforms in cooperation with the ministry of health of KRG to treat severe cases of COVID and cancers for the past two years. We are still getting involved to improve

the health sectors by interconnecting up-to-date technology with the medical sectors. Newroz Holding has a great record in protecting the country and the territory by providing DAS technology and massive surveillance systems that are currently managed by the regional government.

We need to focus on the needs of the DSP, where many ecosystems will be provided by Newroz Holding and its subsidiaries to be a part of the people and community of our nation. We need to not only offer high-speed internet; we need to have more of an ecosystem to serve the current needs and future visions.

How is Newroz Holding supporting Kurdistan's Vision 2025?

Vision 2025 is a long-term development plan for the region, to chart a better future for the nation, one that provides a better quality of life for all. As a nation, we have faced enormous challenges throughout our history, but even more so in recent years. That said, the nation has always been resilient in face of all challenges. The Vision takes a comprehensive look at the main challenges facing us today and then sets long-term goals to overcome those challenges and strengthen our resilience as a nation even further. The Vision is underpinned by four main pillars: citizens, society and national identity; public sector and governance systems; economy and productivity; and the environment, which all tie back to the UN Sustainable Development Goals.

At Newroz Holding, we are supporting Vision 2025 by focusing on integrity, modesty and patience, meeting the needs of people and providing services at reasonable pricing. We are also focused on implementing cutting-edge technology that enriches the lives of our customers.

We recognize that we need to move toward a sustainable business model as we shift from traditional service providers to digital service providers (DSPs) that provide the functional platform that enables the customers

to go to market (e.g., using self-service mobile payment apps to pay utility bills generated by smart meters) with our sister e-wallets firm and digital banking firm.

By categorizing users according to their behaviors, Newroz Holding can better organize its network infrastructure, and as a result, we will be able to assess and modernize our geographical networks with an eye on reducing costs while improving service to customers. In the end, our client engagement will grow, and our CAPEX (cost of initial capital expenditure) will decrease.

What will the impact be for your customers?

The impact for our customers will be improved connectivity with a seamless, end-to-end experience and readily accessible services that meet their special requirements. More particularly, citizens in the region will have access to all government services through any medium and at any time. Services will be intuitive, available and interconnected so that citizens can do all their official business through a single portal, and the user experience across digital services will be unified.

This will have a constructive impact and aid in the growth of our community's economic and social infrastructure, while also providing improved healthcare and education services and broader access to government services, with improved capacity and capability to effectively govern the digital estate in the region.

How have your technology partners been strategically helping Newroz Holding achieve its vision?

Our commitment to collaborating with the government to deliver a strong and resilient network is essential to our company's development as a technological leader. And technology partners like Nokia, with its wide-ranging product portfolio and rich global experience in professional services, will help us accomplish these goals and provide our customers with world-class services. ■



Eng. Mohammed Al-Abbadi, Chief Carrier and Wholesale Officer, stc Group

stc Delivers on Its Mission to Connect the World Through Technology

In an exclusive interview with Telecom Review, stc Group Chief Carrier and Wholesale Officer Eng. Mohammed Al-Abbadi elaborated on how stc is taking concrete actions to ensure that it will continue to provide world-class connectivity and drive the digital transformation of the MENA region and beyond.

How does stc plan to continually invest and expand its capacity and coverage beyond the Kingdom of Saudi Arabia, while maintaining its reputation as one of the best wholesale operators?

As a digital communications leader, stc is always looking at ways to further enrich our customers' lives by improving and growing our capabilities. Through our DARE strategy, we focused on pushing connectivity boundaries and daring to go further. Our continuous global expansion has played a key role in maintaining our reputation as one of

the leading wholesale operators in the region.

We recently launched center3, which aims to build an integrated ecosystem of cables and data centers that seeks to attract hyperscalers, big data, and local and international service providers focused on developing an advanced digital ecosystem for cloud and content providers by integrating a network of submarine cables with our footprint of regional data centers. We have invested in 16 subsea cables globally, aiming to strengthen Saudi Arabia's position as a regional and international data exchange hotspot and its ambition to become a regional digital hub. center3 is the largest provider of telecom infrastructure in the region, offering 300 MW (by 2023) of evolving data center capacity distributed across the Kingdom.

Our global subsea network and diversified internet infrastructure extend our reach across the MENA region. We are delivering services for the region via 32 terabits/second of ultra-high capacity globally.

This is complemented by our voice infrastructure and business relationships (400+ bilateral agreements), which support a regional mobile customer base, including millions of pilgrims and tourists.

stc is driving digital transformation and, in turn, becoming a digital communication leader in the MENA region.

What is your outlook on wholesale business growth in the Middle East region? What will stc's key role be in this?

Against a backdrop of rapid global digital transformation and an even more accelerated pace in Saudi Arabia, stc is taking concrete actions to ensure it can provide world-class connectivity and drive the digital transformation of the MENA region and beyond.

In stc's carrier and wholesale sector, we are focused on driving this digital transformation through four key growth areas: existing asset monetization, network expansion, adjacency

exploration and unconventional offerings.

We are finding ways to unlock the value of our current assets by driving the uptake of our existing products and services. We constantly explore opportunities to enable our customers to reach their end users through mobility solutions, such as national roaming and fixed solutions, to drive more uptake on Fiber to the X (FTTx) and other data services.

Network expansion plans remain a key focus in our strategy, which includes exploring network expansion opportunities to scale up our core network and reach new markets and geographies within the Kingdom and internationally by pursuing the expansion of data centers, international connectivity and national terrestrial networks.

Leveraging our existing capabilities, we have ventured into new adjacent markets to serve our existing customers with new services. This had been achieved by enriching IoT propositions with differentiated pricing, connectivity management and data control, and by offering new value-added services to Virtual Network Operators (VNOs) (e.g., content, gaming, Fixed Wireless Access (FWA), etc.).

We have also explored growth through more unconventional offerings. We are pursuing selected alternative opportunities to diversify our revenues and customer base, which we plan to demonstrate by developing new digital solutions to tap into new growth areas and by launching Air to Ground (A2G) connectivity services, the first of their kind in the region to provide broadband in-flight connectivity.

As a group, we are exploring a 360-degree growth strategy and are moving ahead to identify and develop new solutions, new technologies and new ways to enrich our customers' lives.

Can you share the milestones achieved by stc's carrier and wholesale business in 2022?

stc has achieved great strides in the field of wholesale services. Key milestones over the last twelve months include the

launch of center3, one of stc's largest and most significant projects, as I mentioned earlier.

The launch of the Saudi Vision Cable project was another key milestone for stc. As part of our initiatives to support the Kingdom's Vision 2030, the project connects 4 landing stations (Jeddah, Yanbu, Duba and Haql) and one of the recent subsea investments owned by stc, which aims to provide access to all submarine cable stations across the Red Sea.

Another key moment for us in 2022 was bringing five additional international content providers and three cloud companies to Saudi Arabia. These efforts will lead to reduced application download times and increased video streaming quality while ensuring a smoother, more responsive gaming experience for national subscribers.

Today, we are very proud to see stc deliver on its mission to connect the world through technology.

What advancements has stc integrated into its comprehensive and evolving wholesale portfolio?

As a digital communications leader providing world-class connectivity, we are always evaluating disruptive technologies and trends to incorporate them into our wholesale portfolio. We have launched several projects locally in alignment with the Saudi digital transformation initiatives, such as the open access projects, where we partnered with our fellow Saudi telecom providers to guarantee the provision of fiber-to-the-home (FTTH) broadband services.

stc uses best-in-class technology and infrastructure to lead the way in enabling the world to connect and has greenfield opportunities in areas such as smart cities infrastructure, 5G technology, private networks, edge computing, industrial IoT/M2M, connected cars, autonomous systems, multi-cloud infrastructure, green DC initiatives, etc. We are focused on expanding our services further, reinforcing our role in digital communications and positioning Saudi Arabia as a major digital hub for the region.

We aim to sustain our growth while asserting our market leadership through superior core offerings and an increasingly digital customer experience. At stc, enriching lives is our mission. We are committed to improving the customer journey and increasing customer satisfaction.

To deliver the best customer experience, we work closely with our customers, hand-in-hand, in every development stage of our product life cycle, to help them fulfill their objectives and reach their goals. We believe that success comes from customer involvement, which establishes a strong foundation of trust, value, and loyalty. Our customers' feedback and insights are essential to developing our current wholesale portfolio and unlocking new areas of growth in the new digital economy. **IT**



In stc's carrier and wholesale sector, we are focused on driving this digital transformation through four key growth areas: existing asset monetization, network expansion, adjacency exploration and unconventional offerings



e& Named MEA's Most Valuable Portfolio of Telecom Brands



e& (formerly known as Etisalat Group) has consolidated its position as the most valuable portfolio of telecom brands in the Middle East and Africa (MEA), according to a leading brand valuation firm.

Highlighting its transformation efforts into a global technology and investment conglomerate, e& has achieved remarkable business growth and unwavering stakeholder confidence in 2022, with its portfolio of brands now exceeding a total value of US\$14 billion.

This reflects the success of the Group's business strategy over the past year, which has introduced further improvements in customer service,

more people-focused products and new digital services across its specialist business verticals.

etisalat by e&, the Group's largest telecom brand, also retained its position as the strongest telecom brand across all categories in the MEA region, achieving a score of 89.1 out of 100 and a AAA rating, according to the report. It was also rated one of the top three telecom brands in the world due to its market reach, operational capabilities and outstanding customer service record.

Hatem Dowidar, GCEO of e&, said the Group's endorsement by the consultancy was both humbling and a worthy reflection of the UAE's unstinting commitment to unlock economic growth and potential through its investment in state-of-the-art infrastructure and digital transformation.

"Guided by our 46-year legacy of pushing the boundaries of technology and service excellence, we have emerged as an inspiring global

technology conglomerate; this international recognition makes us extremely proud," he said.

"We will continue to earn the trust of our customers and stakeholders by developing and innovating cutting-edge products and services that meet the needs of our 162 million subscribers in 16 countries across the Middle East, Asia and Africa," Dowidar added.

Shaping a More Sustainable Digital Future

Dowidar said that e& had made significant strides in artificial intelligence (AI), blockchain, virtual reality (VR), augmented reality (AR), the internet of things (IoT), cloud computing and technologies supporting the emergence of the metaverse.

"As we help usher in the next wave of digital tech transformation, we will continue exploring new business models in the digital space. Our strategic priority is to drive new partnerships and investment opportunities that will accelerate the growth of all our business verticals.

TDRA Scores 5-Stars for Management Performance



The Telecommunications and Digital Government Regulatory Authority (TDRA) announced that it has received a 5-star rating from the European Foundation for Quality Management (EFQM).

Last September, TDRA attained membership in the EFQM, through which it would be able to support the implementation of the EFQM's leading advisory approach. The assessment aims to help member organizations

improve their performance and objectives while developing their respective human resources.

During the process of recognition, EFQM's AssessBase platform analyzes a detailed self-assessment document. EFQM's team of 3–4 assessors will review the organization's submission and then each spend 3–4 days with the staff to review every aspect of the performance.

Comprehensive feedback and documentation are given, including a scoring profile and detailed recommendations for improvement based on the organization's bespoke objectives. The feedback includes specific advice based on the EFQM model.

Once recognized by EFQM, the organization is then given a 3–7 star

rating based on its overall score. Many organizations use their star rating both as a badge of honor and a benchmark for continuous improvement. The achieved recognition is valid for three years.

TDRA used the EFQM's integrated services to better equip its own teams to drive excellence as well as cultural change and transformation.

According to Mohammad Al Kitbi, deputy director-general of the Support Services Sector at TDRA, TDRA sought to establish partnerships and cooperation with key leading global organizations in various related work areas to share success stories, conduct benchmarks and utilize the latest global managerial, administrative and occupational/professional systems in the development of TDRA's operation, including cadre qualification and training.

Digital Dubai DG Al Mansoori Lauds Sheikh Hamdan on His 15th Anniversary as Crown Prince



On the occasion of His Highness Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum's 15th year of assuming the post of Crown Prince of Dubai on February 1, 2008, His Excellency Hamad Obaid Al Mansoori, director general of Digital Dubai, shared his wishes for the much-loved and respected ruler of Dubai.

His Excellency Al Mansoori said, "On the 15th anniversary of His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum assuming the mandate of Crown Prince of

Dubai, we proudly look back over H.H.'s remarkable achievements and the critical role H.H. has played in cementing Dubai's global position as a modern, developed, and pioneering emirate. H.H. Sheikh Hamdan has been an inspiration for Emirati and Arab youth and an example of leadership, hard work, and dedication in various fields, most notably modernization, digital development and shaping the future. This was evident in the wide range of government development projects H.H. spearheaded that resonated all around the world.

"H.H. Sheikh Hamdan's unique leadership traits, which include building human-centric cities, commitment to communicating with institutions and taking a hands-on approach to business, have left an indelible mark on Dubai's journey forward," H.E. Al Mansoori added. "This

embodies the forward-thinking vision of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE, Ruler of Dubai, exemplified in the 2008 Decree appointing H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum as Crown Prince of Dubai.

"At Digital Dubai, we remember with great gratitude H.H.'s directives and support for the digital transformation of projects that we are driving across various fields," H.E. continued. "Dubai has made tremendous, world-leading accomplishments, including the full implementation of the Dubai Paperless Strategy, developing a fully integrated digital government, using digital data and advanced technologies, among others. These achievements have established Dubai as a role model and an actual City-as-a-Service concept.

Hamad International Airport Launches Wi-Fi 6 Coverage



To further improve the passenger experience, Hamad International Airport (DOH) has announced the rollout of next-generation Wi-Fi across its state-of-the-art terminal, powered by Cisco technologies. Passengers traveling through Qatar will have widespread access to high-speed connectivity, making it simple to connect with loved ones, friends and business associates.

In-depth design studies were conducted to achieve seamless Wi-Fi coverage from the curbside of the terminal to the aircraft and to provide sufficient capacity and speed to meet and exceed the needs of our

passengers. The areas of the terminal where a large number of passengers spend a lot of time, like the boarding gates, shopping areas and food courts, received special attention.

To meet the demands of an increased passenger flow in Qatar in the coming years, Hamad International Airport (DOH) has implemented these Cisco wireless technologies, including indoor and outdoor Wi-Fi 6.

Along with providing high-performance wireless connectivity throughout the entire airport, the installation will lay the groundwork for improved operations and better insights that will result in an amazing passenger experience.

With the help of this investment, Hamad International Airport will be better able to comprehend passenger flow, dwell times and traffic patterns. Millions of passengers arriving at the airport from all over the world each year can now connect using single-step authentication procedures via

a simple "WhatsApp" message or by scanning their printed boarding pass.

As a testament to the program's initial success, over two million passengers utilized the new Wi-Fi service to seamlessly consume over 1 PB (petabyte) of internet content during the FIFA World Cup Qatar 2022.

The mobile app "HIA Qatar" for Hamad International Airport will provide better location-based services as a result of technologies built into the airport's new Wi-Fi network. Real-time wayfinding for locations like baggage claim, boarding gate location and food are all included in these services, in addition to beverage and retail offers from Qatar Duty Free (QDF). The "HIA Qatar" app warns users when they pass stores with active sales and promotions to make sure that tourists get the best deals. Future use cases for this system will include the timely and efficient allocation of resources like wheelchairs, buggies, and various aviation tools and equipment.



Tech Industry Slump Causes a Blow to Workforce and Brand Value

The technology industry is yet to recover from its current predicament of dismissing employees and suffering from depreciation. The drop in demand from the COVID-19 crisis amid a steep rise in costs has led several executives from the sector to reverse their course of action in the HR department and lose significant value due to shifting demand patterns.

Massive Layoffs Layoffs are not confined to the tech industry, of course. But, the predicted recession that will strike the United

States and Europe in 2023 is the major reason why IT businesses are opting to remove thousands of employees from their operations.

Among those implementing the latest cuts in 2023 is Google parent Alphabet, which is eliminating

about 12,000 jobs, or 6% of its workforce. This will affect roles across departments, functions, levels of responsibility and regions, CEO Sundar Pichai said in an email to employees. Nearly 187,000 "Googlers" were hired worldwide at the end of September 2022.



Pichai expressed somber feelings about the impact that these changes will have on the company's employees, claiming full responsibility for what led to this decision.

Additionally, Microsoft said that it would reduce its staff numbers by 10,000 in the coming months "in response to macroeconomic conditions and changing customer priorities." This followed two smaller rounds of layoffs in 2022 — one in July and the other in October.

Swedish music streaming service Spotify also announced that it's cutting 6% of its global workforce — about 600 employees — as it contends with a gloomy economic environment that has seen consumers and advertisers limit their spending.

Online retail giant Amazon will also cut more than 18,000 jobs from

its workforce. Among the factors that influenced this action are the uncertain economy at present and the unsustainable hiring spree during the pandemic. To meet an explosion in the demand for deliveries, the company doubled its global staff between the beginning of 2020 and the start of 2022.

Mark Zuckerberg called it "the most difficult changes we've made in Meta's history," as the CEO of the company that owns Facebook, Instagram and WhatsApp announced in November 2022 a cut of 11,000 jobs or around 13% of its overall staff.

Around the same time last year, Elon Musk sacked half of Twitter's 7,500-strong staff as part of his major overhaul. And more employees quit after Musk announced that remaining Twitter employees would be expected to commit to a "hardcore" work environment.

And at the end of August 2022, Snapchat's parent company, Snap, let go of about 20% of its employees — around 1,200 people — to dig itself out from competition and revenue woes. The company has been saddled with diminishing profits and competition from other trending apps such as TikTok.

According to a noted tech site, nearly 194,000 industry employees have lost their jobs in the US since the beginning of 2022. These requisite severance packages have varied from company to company, ranging from the minimum legally required to longer-term packages that include healthcare benefits and accelerated vesting.

Tech Brands Fall in Value

In the face of the workforce reduction, and despite its brand value falling 15% from US\$350.3 billion to US\$299.3 billion, Amazon has nonetheless reclaimed the top spot from Apple as the world's most valuable brand, according to a leading brand valuation consultancy.

Customer perception of service at

Amazon has fallen, and consumers have become less likely to recommend the company due to its lengthened delivery times. As COVID-19 restrictions ease, people are returning to in-store options to buy what they need.

Apple's brand value, which is down by 16% to US\$297.5 billion, has fallen to second place. Other tech-focused corporations that have lost brand value include Alibaba.com (down 56% to US\$10 billion), Facebook (down 42% to US\$59 billion) and WeChat (down 19% to US\$50.2 billion).

Stock market analysts have cited 2022 as a turbulent year, with the Dow Jones US Technology Index (which tracks major tech companies) down more than 35%, and the NASDAQ, another tech-focused index, down over 33%. From November 2021 to November 2022, investors lost roughly \$7.4 trillion, based on the 12-month drop in the NASDAQ.

Investors are right to worry that the tech slump is a bad sign for the economy, and no one knows for sure how long it will continue. This is not the first time big tech has seen its valuations slide; historically, tech stocks fare poorly during recessions, seeing layoffs and slow growth as investors flock to more stable options.

It is implied that tech businesses are believed to have at least two years — until 2024 — of higher interest rates before they can expect some relief from the central bank.

Many feel tech stocks will see another major dip in the coming months, and indeed, if tech firms start missing expectations, more large dips could be on the horizon.

If that weren't enough, specific sectors such as cybersecurity and automation are expected to outperform the tech market as a whole due to increased enterprise demand. Considering these factors, the technology industry should plan for a bumpy road ahead. **TR**

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Miniaturization on the Horizon: Sensors, CPU and Network

Nanotechnology is evolving into an auspicious alternative to traditional system applications, bringing advanced materials and superior performance capabilities to a variety of industrial fields. Such industries are adopting nano-approaches to produce important, high-value products with increased capabilities, reliability and effectiveness at a miniaturized scale. Patterns of micromechanical-electronic techniques combined with nanoscale structures enable the design of innovative miniaturized devices and also push the boundaries of analytical methods.

The miniaturization of electronic components has made it possible to make small, portable, wearable computing devices that can be carried anywhere, anytime. This results in compact, lightweight devices with high processing power being available on the market. The devices are becoming even more portable as the parts can be hidden in clothing or embedded in handbags, making them easier to tote for long periods of time.

Sensor Miniaturization for Monitoring Physiological monitoring

A lot of people, particularly athletes, are constantly on the lookout for innovative technologies to obtain a competitive advantage and enhance their health and performance. They are increasingly switching to wearable sensors to track

their training and recovery. Wearable technologies are presently used by sports teams to assess players' internal and external workloads.

Wearable detectors for sports are still in their infancy, but they are being used to measure movement parameters such as distance, velocity and acceleration. There remains a major need to "quantify the athlete" by measuring biochemical parameters, including electrolytes and neuropeptides, all of which reflect physical exertion/fitness, fatigue and internal perceptivity.

As an example, the temperature-sensitive resistor, or thermistor, was one of the first and most commonly used sensors in animal tracking systems. A thermistor is a special type of resistance designed to impede electrical-current flow, the degree of which is controlled by temperature.



The miniaturization of electronic components has made it possible to make small, portable, wearable computing devices that can be carried anywhere, anytime



Moreover, the human body produces several measurable signals that indicate activity on different systems. One such biosignal is the Galvanic Skin Response. GSR mirrors the activation of the autonomic nervous system, which is in charge of controlling functions of the human body such as heart rate, digestion and breathing. Furthermore, the phybrata sensor is a non-invasive sensor that is used for objective detection and measurement of impairments and sensory reweighting impacting several physiological systems following concussion injuries.

Environmental monitoring

The Wireless Sensors Network (WSN) has various uses in earth science research now that environmental sensor networks have matured. These deployments involve monitoring volcanoes, seas, glaciers and forests, among others.

For instance, in air pollution detection, WSNs have been installed in a number of cities to monitor the concentration of precarious gases. These may use ad hoc wireless networks, making them more mobile for evaluating readings in various locations.

A landslide discovery system employs a WSN to find minor soil movements and changes in several parameters that may occur before or during a landslide. So, it may be possible to predict its occurrence long before it actually happens.

Moreover, in order to identify fires, environmental sensors might be deployed in the forest. These nodes can detect temperature, humidity, and gases emitted by tree or plant fires in the surrounding environment. Early detection is crucial, as it will allow firefighters to determine when a fire begins and where it might spread.

What Is the Actual Meaning of CPU and Its Advantages?

A mini CPU is a small central processing unit that runs the many computational tasks on small computers like netbooks and smartphones — especially smartphones. Compact, lightweight and portable devices with a lot of

computational power are a main focus for developers.

Increased processing power

This is maybe the most apparent advantage of having a CPU with cores — more cores mean better processing power, which can be a huge boon for users who need to do tasks such as video editing or 3D real-time and 3D post-process rendering.

Decreased power consumption

Although they offer increased performance, CPUs with more cores actually consume less power because each core can be powered down when not in use, consuming less energy than their single-core counterparts. Consequently, this leads to lower overall power consumption.

Improved multitasking abilities
Multitasking is another area where CPUs with more cores excel. Since each core can handle its own task exclusively, the overall system can juggle multiple tasks simultaneously without any subnormality.

The Maximum Restrictions to Miniaturize a CPU or Transistor

There are actual physical limits that will eventually be reached, whether it be the highest operating frequency of a CPU, the tiniest size of a transistor, or the lowest voltage at which transistors can operate. It turns out that we can determine what these limits are, regardless of whether a device at its theoretical limit is commercially available or not. You might discover that the smallest transistor is the size of a single atom (most likely a bi-directional switch controlled by a photon), for instance, because the smallest transistor made from a semiconductor cannot be smaller than the physical elements that it is made of. Additionally, we are aware that the fastest electrical wavefronts in a wire limit the maximum operating frequency and can determine the highest bandwidth possible.

Advancement

In fact, technological development benefits consumers in countless aspects of their lives, including work, communication and the use of natural resources. These innovations in many



different markets are helping society by making certain tasks easier to perform. Innovation never ends. Rather, it will continue to evolve more and more rapidly as science and technology become more innovative.

Miniaturization offers a plethora of opportunities for advancement in many areas, especially in the medical device industry. Innovative assembly techniques, tools, processes and know-how are required to meet the challenges and push the limits of miniaturization.

The success of a technology largely depends on whether society accepts or rejects the product and whether it furthers our societal journey. **TR**



Innovative assembly techniques, tools, processes and know-how are required to meet the challenges and push the limits of miniaturization





How Hyperautomation Will Transform CSPs

Until recently, communications service providers (CSPs) globally depended on robotic process automation (RPA) for tackling repetitive and routine tasks. RPA allowed CSPs to transform operational processes, achieve organizational growth and leverage customer service by enhancing agility and scalability, improving data communication and transmission, and maintaining high levels of data security and cost-effectiveness. With a large chunk of time-consuming tasks slashed, employee efficiency increased, giving way to innovation and a focus on customer well-being. However, with rapid 5G deployment worldwide and the promise of enhanced mobile broadband experience for users (as well as next-gen use cases for digital services and complex processes), CSPs are embracing hyperautomation to deliver an unparalleled network experience and greater cost savings to both customers and enterprise segments.

Hyperautomation is an extension of automation with an added layer of advanced technology, making it

possible to do more with this effective combination.

"5G comes with cloud-core architecture which requires managing the performance to bring and map together the data from the world of IT,

cloud, and networks. This is exactly what we are doing. We are eliminating these silos to enable end-to-end network and service quality assurance for both consumers and enterprises," says MYCOMOSI's Founder and CEO, Mounir Ladki, speaking about

his company's collaboration with cloud service providers to deliver advanced automation solutions for the enterprise.

Indicating the growing popularity of the technology, recent market research predicts the global hyperautomation market will reach \$118.66 billion by 2030, with a CAGR of 16.5% from 2022 to 2030.

Hyperautomation as a Differentiator

With the orchestration of multiple technologies, tools and platforms such as artificial intelligence, machine learning, event-driven architecture, RPA and advanced analytics, hyperautomation is poised to take business process automation to the next level, with special consideration in the following areas:

Cost reduction: Streamlining workflows through automation is bound to benefit a company's profit margin. With a focus on valuable and crucial activities, CSPs can deliver their service offerings to a wider customer base and ultimately expect better ROIs. Investment in hyperautomation across functions such as customer service, finance and HR can result in better cost savings.

Interoperability: With the integration of leading technologies, such as AI, ML, RPA and business intelligence systems, hyperautomation allows a large section of enterprise-level users to harness the best virtual workforce that is resilient and intelligent. It also enables process optimization by enabling the discovery, design, build, enhancement and self-learning features for various use cases across functions and domains, allowing clunky on-premise technology and distinct data systems to communicate seamlessly.

Competitive positioning: Companies in the dynamic telecom market find it difficult to predict what types of use cases will be deployed on future networks or the types of devices that will be connected. Hyperautomation can bridge this gap through AI-enabled learning and data exploration for forecasting mobility and different

usage patterns, anomaly detection, and IT data analysis. As such, CSPs can develop future-proof operations and be in control of their competitive advantage in the ever-evolving market.

Strategizing for Hyperautomation

With massive digital transformation journeys taking place across industries, hyperautomation is expected to become a driving technology through 2023 and beyond. With the technological capabilities currently available with hyperautomation, CSPs can transform their core business operations and thus usher in the coming Industrial Revolution 4.0.

In strategizing a watertight hyperautomation implementation plan, CSPs would do well to consider the following suggestions from the automation experts.

Identify: Identify potential opportunities for automation with expected business outcomes in terms of revenue, expenditure and business risks; redesign processes to maximize benefits; and follow a detailed assessment to finalize a strategy for automation.

Evaluate: Devise and develop automation solutions and deploy them in the production environment. Optimize the existing processes and standardize data inputs and decision logic.

Automate: Implement process automation with AI as augmented intelligence. Determine how well the company is realizing the aforementioned business outcomes and plan further steps for the automation program.

Successful implementation of the hyperautomation technology should result in the following operational efficiency gains for CSPs:

- Detailed valuation of processes with data-based process assessment
- Effective prioritization for process automation as determined by key metrics
- Efficient tracking initiatives with

cloud-based and platform-agnostic tracking tools

- Centralized real-time reporting with a one-stop-shop for monitoring the entire automation program

Hyperautomation and AI are at the core of digital transformation for operational efficiency, and CSPs wanting to accelerate their digital transformation in today's technologically advanced era should focus on partnerships and long-term collaboration with stakeholders to innovate and design solutions that can add business value for them as well as for their customers. Automated IT processes will lead to easier identification, assessment, and innovation in IT processes. With AI and ML at the core, supported by the cloud, networking silos can be collapsed, leading to enhanced interoperability. Ultimately, an experimental and innovative team will result in an agile organization that is capable of tackling the challenges of the future head-on. **TR**



With massive digital transformation journeys taking place across industries, hyperautomation is expected to become a driving technology through 2023 and beyond





Boosting Fiber Networks Capacity

On today's information highway, perhaps the best conduit to carry data so far has been optical fiber or fiber optic cables. Fiber optics transmit data using light as the carrier through optical fibers that are thinner than a human hair. Over the years, this technology is steadily gaining popularity with its advantages like higher bandwidth, better long-distance communication, lighter weight and higher security compared to metal cables.

Fundamentally, in one fiber pair, half of the world's population could be talking to the other half simultaneously. Its capacity to transport data at record speed is unmatched

by all the other alternatives to wired backhaul.

Fiber-based networks make up the majority of the internet's backbone. Fiber optic subsea cables running across thousands of miles connect continents, exchanging data at nearly

the speed of light. As smarter devices and ubiquitous connectivity become part of our digital fabric, with artificial intelligence and edge computing transforming industries and other day-to-day activities, FO will continue to become an integral part of the digital ecosystem.

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From homes to factories and machines to offices and personal desktops, optical fiber connections provide ubiquitous optical connectivity for Internet Service Providers (ISPs) and governments, including sectors such as energy, transportation, finance, education, healthcare and manufacturing.

Keeping up with the times, the UAE has one of the highest Fiber-to-the-Home (FTTH) penetration rates and has maintained its leading position since 2016. It was even ranked number one by the leading industry body, the FTTH Council, in its annual report that showcases the countries with the highest fiber optic network penetration globally. UAE's fiber network coverage surpassed that of Singapore, China, South Korea and Hong Kong, according

to the report. The global top 5 rankings are led by UAE with 97%, followed by Singapore (95.8%), China (94.9%), South Korea (91.1%) and Hong Kong (86.2%).

Where's the Demand Coming From?

As alluded to earlier, the power of fiber-optic connectivity has come to encompass almost every key sector. For example, in the utility sector, the Dubai Electricity and Water Authority (DEWA) recently completed the extension of Fiber Optic (FO) ducts to 3,634 kilometers (unaltered since 2015) to enhance DEWA's infrastructure of FO and its smart grid in line with the future needs of the Fourth Industrial Revolution. In collaboration with Huawei, DEWA's FO network supports the InfraX Network Operations Center to provide innovative digital services,

including Digital DEWA's data center and cloud-computing value-added services. Other sectors have followed suit and have already established detailed FO implementation plans.

Motivated by such demand in FO, UAE operator Etisalat UAE, branded as etisalat by e&, in collaboration with leading ICT vendor Huawei, recently completed the trial of 1.2 Tbps/channel that is set to drastically slash the cost per bit of telecommunications networks. During the trial run, the single-fiber transmission touched an overall capacity of up to 96 Tbps. etisalat by e& will leverage the 1.2Tbps/channel technology to address the growing demand for capacity as a result of the shift towards online digital behaviors, cloud-based business services, enhanced home broadband

and 5G services. It uses the dense wavelength division multiplexing (DWDM) optical fiber multiplexing technology that increases the bandwidth of existing fiber networks.

“The successful trial of 1.2 Tbps/channel with Huawei is a result of our continuous efforts to deliver enhanced customer experiences by pushing the boundaries of what is possible as a digital telco. This has resulted in etisalat by e& taking the lead in building one of the most advanced networks globally and using industry-leading technology to deliver superior network services to our customers across UAE,” says Marwan Bin Shakar, senior vice president, access network development at etisalat by e&.

Ubiquitous Connectivity

Moreover, the combination of Cloud technology and the mobile internet has offered mobile users the luxury of streaming music, films and online games from their rooms to their cars. Fiber will be crucial for features such as immersive gaming, in-vehicle experiences, digital payments etc. Furthermore, the next-gen 5G technology is set to introduce many more new use cases that will depend on the massive transport capacity that only fiber connectivity can provide.

Some Recent Developments in Fiber in MENA:

The Bahrain Network (BNET) bagged the 2022 Telecom Review Excellence Award for “Best Middle Eastern Fiber Infrastructure Deployment” for its ambitious fiber infrastructure projects. As part of

Bahrain’s 5th National Telecommunication Plan (NTP5), BNET is instrumental in rolling out a fiber optic network to 100% of all businesses and 95% of all households across the Kingdom of Bahrain. With such implementation, Bahrain is poised to accelerate the growth and economic diversification of its telecommunications sector.

In November, the RIPE Network Coordination Center (RIPE NCC) — the regional Internet registry for Europe, the Middle East and parts of Central

Asia — and the Telecommunications and Digital Government Regulatory Authority of the United Arab Emirates (TDRA) hosted the sixth government roundtable for Arab ICT ministers and heads of regulatory authorities. High-level government delegations from the UAE, Oman, Yemen, Lebanon, Qatar, Iraq and the League of Arab States extensively discussed the challenges facing digital infrastructures in the Arab countries. The roundtable discussed ways to increase the connectivity and security of the Internet, such as continuing the deployment of IPv6 to meet the massive demand for connectivity, employing Resource Public Key Infrastructure (RPKI) to ensure the safety of networks and building IXPs to enhance peering, lower operational costs and reduce reliance on external networks. These developments will only increase the demand for fiber connectivity in the region.

Given the rapid development of the global digital economy and the need for computing power at scale, ICT product manufacturers such as ZTE, Huawei, Nokia among others are developing and deploying server and storage products in over 40 countries and regions around the world. Such trends will see the data transport requirement reaching new levels in sectors such as communications, Internet, finance, power, government and transportation, among others.

Preparing Fiber Power

Despite the potential of fiber optics’ capacity for faster connectivity, some ever-present challenges in the cable deployment process could easily offset the expected network performance. Here are some considerations worth paying attention to:

Ensuring Adequate Length of Cables

Each facility has different area dimensions, and the exact measurement of the required cable is crucial. Experts suggest ordering extra lengths to ensure enough slack (as opposed to a tightrope) in end-to-end connection. Correct measurement of the cables will not only prove cost-effective but will also ensure a hassle-free installation process.

Using a Port Map

While installing cables, a detailed port map acts as an inventory sheet and installation guideline. The map will specify port connections and the location of network cabinets, patch panels and other hardware for quick reference and efficiency, resulting in a faster installation process.

Picking the Correct Specification

Determining the cable’s tensile and pull load ratings is crucial, as the tensile rating will help estimate the required tension on the cable and prevent the breakage of fiber. Similarly, by monitoring the pull load rating, the cables can be protected while being pulled around the installation premises with cable pullers and conduits. As fiber optics are normally made of glass or plastic, they can be fragile and vulnerable to disruptions.

Reducing Distance and Pull Lengths

Fiber optic cables can be used in short-, medium- and long-range scenarios. However, experts suggest shortening the distance whenever possible for better network performance — the shorter the cable distance, the faster the signal and information transfers. Also, a shorter cable reduces the pull length, minimizing the chances of breaking the cable.

Quality Matters

Finally, there are different types of fiber optic cables on the market today; however, network performance will greatly depend on the quality of the cables. Hence, while investing in fiber, organizations need to think about the long-term benefits and not choose inferior products that could prove costly in the long run.

Until now, fiber optic technology has had no equal alternative for data transport efficiency. However, like all network technology, fiber optic processes are evolving. Still, the best practices for fiber optic cable installation remain constant. Despite being the leading technology that it is today, the power of fiber is only as good as how well its installation is managed. Proper fiber installation management will go a long way in ensuring that the investment is worth every penny. **TE**



Aqaba Digital Hub: Paving the Way for Digital Growth in the MENA Region

The digital age has created new opportunities and challenges for businesses, making access to reliable and efficient digital infrastructure more important than ever. To help businesses in the region stay ahead of the curve, Aqaba Digital Hub is launching a game-changing project that is poised to have a major impact on the digital landscape.

Construction on the Aqaba Digital Hub officially began in 2022, marking a major milestone in the project's development, which includes a multi-hall concept consisting of six independent data center halls. This flagship initiative aims to satisfy the anticipated high demand for digital services in Jordan and its neighboring countries.

One of the key features of the Aqaba Digital Hub is its focus on neutral infrastructure. Unlike many other data center projects, the Hub is designed to complement, not compete, with other operators. This is reflected in the project's partnerships with key local, regional and international operators. These relationships are helping to build the fully neutral foundation needed to establish the Aqaba Digital Hub as a hub for digital innovation.

For businesses, the Aqaba Digital Hub offers a unique opportunity to establish a presence in the region and benefit from the project's cutting-edge digital and ICT platforms. These platforms provide businesses with the infrastructure needed to access the growing market of customers and partners, lowering their capital and operational expenses significantly.

Another important component of the Aqaba Digital Hub is AqabaIX, the first and only internet exchange point (IXP) in Jordan, which has already attracted major local, regional and international telecom operators as well as key content delivery networks targeting Jordan and the MENA region. The IXP is expected to have a major impact on the quality of internet services in the region, providing faster and more reliable access to digital content and services for consumers.

The Aqaba Digital Hub is not just a project; it is a solution to the growing demand for digital services and a platform for companies and industries to connect, grow and succeed in the digital age. With its focus on neutral infrastructure and partnerships with key local as well as international organizations, the project is well-positioned to drive growth and innovation in the digital economy and help industries stay ahead of the curve.

Whether you're a financial services provider, educational institution, content delivery network, operator, internet service provider, consumer, government or any other type of organization looking to establish a presence in the region or take advantage of the growing digital landscape, the Aqaba Digital Hub may be just the project you need. With its focus on delivering cutting-edge digital platforms and attracting key players in the digital economy, the project is poised to have a major impact on the success of companies and industries in the region. **Don't miss this opportunity to connect, grow and succeed with the Aqaba Digital Hub.** [\[1\]](#)



**Mounir Ladki, co-founder,
president and CTO MYCOM OSI**

MYCOM OSI: Eliminating Silos to Enable End-to-End Network and Service Quality Assurance

Mounir Ladki, co-founder, president and CTO MYCOM OSI, bagged this year's Telecom Review Award for Global Merit Leader CTO of the Year – Vendor. Here, he speaks to Telecom Review about his company's efforts in hyperautomation to enhance operational efficiencies in customer segments.

Please tell us about MYCOM OSI's 5G Assurance solutions. How are they helping consumers and enterprises?

Today, CSPs around the world are deploying 5G at pace. There is a global competition to win market share with both consumers and enterprises. 5G comes with two key promises — enhanced mobile broadband experience to users and a new generation of use cases for enterprises for digital services. As such, 5G has to deliver an exceptional performance level and guarantee quality of service. Our assurance solutions are helping CSPs to deliver that level of unparalleled network experience to both customer segments. At the same time, 5G comes with cloud core architecture which it requires in order to manage the performance to bring and map together the data from the world of IT, cloud and networks. This is exactly what we are doing. We are eliminating these silos to enable end-to-end network and service quality assurance for both consumers and enterprises.

How is MYCOM OSI collaborating with cloud service providers for its automation solutions, and how is it transforming telco operation centers?

The assurance of 5G needs to come with automation, and automation needs AI at its heart because we don't know


what use cases would be deployed on these networks tomorrow. We don't know what devices will be connected. So, we need automation that continues learning and exploring data, and that is why AI is so critical. To execute AI at scale, we need massive compute and storage resources, especially in the telecom use cases. Training modules take enormous bandwidth and resources. Hence, collaboration with cloud service providers becomes absolutely necessary. For this very reason, we have completely re-engineered our platform and portfolio to be cloud-native. Today, through our strategic partnership with AWS, for example, we offer our solutions as SaaS on the cloud and enable the successful delivery of scalable, AI-based automation solutions.

Please apprise us of MYCOM OSI's latest projects using artificial intelligence (AI). What are the challenges?

We are focusing on four key use cases. 1) Forecasting: we are in a world where the behavior of users, be they people, machines or devices, is highly unpredictable with high mobility and different usage patterns. Hence, we are using AI technology to help our customers forecast and anticipate the usage and needs for optimal experiences. 2) Anomaly detection: we are using AI to detect the problems that humans cannot detect as fast

in real-time. 3) Data correlation: we correlate complex datasets together for automated root-cause analysis (RCA). 4) Data fabric: there are a lot of challenges because complex technologies require a lot of IT resources and at the same time require high-quality datasets which we bring with our data fabric. The combination is bringing unparalleled AI/ML-based automation solutions for our CSP customers.

Given the current global economic uncertainty, how is MYCOM OSI strategizing its growth roadmap?

The current macroeconomic and geopolitical climate is in fact putting a lot of inflationary pressures on our customers. On average, 60% of the cost base of a typical CSP has been impacted by inflation as a result of rising energy costs, salary cuts and so on. Because of that, the automation solutions that we are bringing are helping our customers gain efficiencies. In fact, we are committed to automating up to 80% of network and service operations of our customers, enabling them in the longer term to progress towards autonomous networks and gain a 10x factor in terms of efficiency. The huge operational efficiency gains are helping us to grow, become more strategic with our customers and, then at the same time, give them the proper tools for efficiency and help improve their profitability levels 



May Li, VP of solution marketing, Huawei

We Envision More Advanced and Superior User Experience in 5.5G Era, Says Huawei's May Li

The Telecom Review Excellence Award for Best Middle Eastern Vendor and Best Middle Eastern 5G Innovation (Vendor) went to Huawei Middle East. May Li, VP of solution marketing, Huawei, shares her company's vision and technological development in the advancement towards a 5.5G era.

Many operators in the region have commercially launched 5G services. What are your views of overall 5G development in the region?

5G has been in the region for over three years. There are 17 commercial networks launched with over 16 million 5G users across the region, including over 1.3 million home mobile broadband users and 45,000 business users. The early launch of 5G networks has brought massive benefits to the carriers in the region. For example, in the first year launch of the 5G network in Kuwait, we have seen carriers' overall profitability increase by 13%. The success of the 5G network depends on a number of reasons. One of those is well-balanced spectrum policies across many countries. Secondly, it is the innovative services launched by different carriers such as home mobile broadband as well as business services. Lastly, it is the fair and open business environment that encourages carriers to select better technology to deploy networks without any restrictions.

Can you share with us the future of 5G evolution?

5.5G will bring more advanced features to the networks. This concept of

5.5G was outlined by Huawei back in 2020, and 3GPP officially launched 5G Advanced in 2021. What we see in the 5.5G evolution is that there will be a whole bunch of new wireless technologies that can provide better capacity, better coverage and better spectrum efficiency. In addition to that, we will see the deployment of passive IoT that utilizes RFID technology to reduce the cost of IoT devices and make them more energy-efficient, using less or no power at all. Together with RedCap and NB-IoT, passive IoT will provide 100 billion connections that we envision with significant acceleration of industrial digital transformation. Another technology that we are looking at is sensing technology. This will totally help to transform business scope in the communication networks. Altogether, we envision more advanced and superior user experience. We will address some of the bottlenecks, for example, the video uploading bottleneck we experience in 5G networks, and enable billions of connections to help with the industrial transformation.

Huawei's vision is to connect people and organizations for a future intelligent world. How can carriers prepare themselves for this transformation?

The future intelligent world that requires ubiquitous intelligence to integrate the virtual and the physical worlds that

will generate and transmit a massive amount of data. Huawei predicts that, by 2030, there will be 200 billion connections worldwide, and data will reach 1 Yottabyte every year, a 23-fold increase compare to now. As a result, there are increased demands for intelligence, resiliency, security and efficiency in the networks. To meet these demands, Huawei have proposed concept of 5.5G Era, which give carriers comprehensive views of what required to be ready for the future intelligent world. In addition to the 5.5G evolution in wireless network, the 5.5G era includes F5.5G technologies for fixed network, Net5.5G for IP networking, together with telco cloud based 5.5G core, AI enabled level 4 autonomous driving network and -layer green development in the site, network and operations, the future 5.5G era will

- Improve seamless user experience by 10 times.
- Extend communication business connectivity to sensing.
- Enable wide ranging of applications with diversified computing
- Break through the existing limits in storage architecture with data-centric storage design
- Achieve L4 high autonomy communication network with full stack AI native autonomous driving networks (AND) transformation
- Meet sustainability objectives with green development solutions **TR**



Ken Campbell, partner,
PMP Strategy

Telecom Industry Will Face Increasing Pressures and Demands, Says Ken Campbell

During the 16th edition of the Telecom Review Leaders' Summit, one of the industry players who participated in the event was Ken Campbell, a partner at PMP Strategy. In this Telecom Review exclusive, he shares his views on digital transformation trends and how telcos will evolve and be impacted by new customer demands and opportunities.

What is the importance of TMT strategy consulting in helping companies

assess growth opportunities?

We help companies to identify opportunities to improve their top line with their current business while also seeking out new growth opportunities, as we move towards 5G (and the opportunities that this technology represents) and we see increased demand on our fixed and mobile networks. We also help to identify new markets and new opportunities for expansion by putting together the right analytics and the right market assessments to understand where the opportunities really exist with existing or new customer segments.

As a veteran in the telecom industry across multiple markets, what is your take on the digital transformation impacting the industry? What are the key drivers behind it?

Digital transformation has been taking place for a while, particularly in a lot of markets that I've worked in, including Europe, Africa and North America. The key drivers are clearly to improve the

customer experience and to drive down the costs to sell and service, while creating a more efficient company.

We've seen plenty of examples of great digital brands being launched and of transformation in the way they activate and the way customers are getting served, resulting in a more streamlined operation, which is critical for any telco in the future. Our businesses are challenged to continue to make sizeable investments in infrastructure. Without a concerted effort at digitalization, we will struggle to have an operation to support these investments.

What are the key strategic and operational issues that telecom operators and service providers face? How could these be resolved?

The mentality of transforming our businesses from a 'telco' to a 'digitalco' is one of the biggest challenges. Legacy systems and sometimes people, will often slow down an organization's ability to change - so how those systems need to adapt or be replaced is also an important element that operators need to consider. Regarding people, we often see a set mentality on how a telco should work. If you approach this from a digital

perspective and really challenge the organization to achieve step changes in efficiency, you start to think about it very differently, and you can end up with a much leaner operation that is fit for purpose in today's age.

Overall, there's a massive challenge in moving from legacy systems and processes, or the way business is being done, to a more digitally-oriented approach. This requires a more streamlined effort on how you treat customers from all angles.

How do you envision the telecom industry five years from now?

I think that operators are going to face increasing pressures. Currently, we are seeing telcos delayering and disaggregating their assets by selling off their towers or data centers. I think telcos will be more oriented toward service and utilizing digital platforms. We're going to see more shared networks in five years' time. Moreover, customers will be asking for more services — not just connectivity — that could impact how they manage the way they live, work and play. Increased demand will be there, and this will mean the telecom industry faces significant change in the upcoming years. **TR**

e& Announces Stake Increase in Vodafone Group



e& (formerly known as Etisalat Group) has further increased its stake in Britain's Vodafone Group.

With the current announcement, the technology group now holds more than 3.272 billion shares in Vodafone, representing 12% of the British mobile phone firm's issued share capital, excluding treasury shares, according to the company statement presented at the Abu Dhabi Securities Exchange (ADX).

"Executed at what we believe is an attractive valuation, the investment rationale is unchanged from our announcement on 14th of May, 2022, specifically to obtain significant exposure to a global leader and leverage potential commercial partnership and realise future return on our investment," the Abu Dhabi-based firm said.

In May, Etisalat became Vodafone's biggest shareholder after acquiring a 9.8% stake in the company for \$4.4 billion. The state-backed firm further increased its stake to 11% in December 2022.

Vodafone is one of the strongest and most globally recognized brands across the telecom industry. It is a pioneer of digital transformation, offering some of the most advanced technology and next-generation solutions, including

IoT, telematics, B2B solutions and FinTech services, within the telecom industry and for the wider benefit of society. Vodafone's strong reputation for being a leading digital-first operator, underpinned by its rigorous approach to corporate governance and well-regulated global footprint, makes it an attractive opportunity for e& at this current time.

Etisalat Group changed its brand identity to e& in February 2022, as part of a wider strategy to accelerate resilient long-term growth. Successfully aligning all its business verticals and subsidiaries, e& raised its brand profile globally through impactful communications and international partnerships with such admired brands as Etihad Airways, the Abu Dhabi Formula 1 Grand Prix, Manchester City Football Club, and African football giants Al Ahly SC.

Sheikh Ali Bin Jabor Al Thani Appointed as New Ooredoo Qatar CEO



Ooredoo Group has announced the appointment of Sheikh Ali Bin Jabor Al Thani as the new Chief Executive Officer of Ooredoo Qatar.

Sheikh Ali moves to Ooredoo Qatar from his most recent role as chief legal, regulatory and governance officer at Ooredoo Group and brings to his new position several years' experience of senior leadership responsibilities across Ooredoo Qatar and Ooredoo Group since joining the company in 2013.

Sheikh Mohammed Bin Abdulla Al Thani will end his secondment in the role of CEO at Ooredoo Qatar and will be fully dedicated to his role as deputy

group CEO at Ooredoo Group, with responsibility for group management and operations.

A particular highlight of his tenure was the tremendous success of FIFA World Cup Qatar 2022, for which Sheikh Mohammed is to be commended for his invaluable leadership. With Sheikh Mohammed at the helm, major partnerships were signed to ensure the creation of the best FIFA World Cup yet, with records being set for data traffic and calls and the most enhanced fan experience ever seen.

Other notable achievements under Sheikh Mohammed's tenure are the company's contribution to the flagship TASMU Project, designed to cement Qatar's position as a digital leader; expansion of the pioneering 5G network; and partnerships with some of the world's leading technology and innovation giants.

Further C-suite appointments include the confirmation of Sheikh Nasser Bin

Hamad Bin Nasser Al Thani, previously chief commercial officer at Ooredoo Qatar, as chief corporate affairs officer at Ooredoo Group, and Dr. Hamad Yahya Al Nuaimi as group chief board affairs officer, moving from his previous role as chief corporate affairs officer at Ooredoo Group.

Aziz Aluthman Fakhroo, managing director and group CEO at Ooredoo Group, said: "I am pleased to announce these senior appointments, which reflect the ongoing evolution and development of Ooredoo. We have a strategic commitment to investing in our people; to attracting and recruiting the brightest talents; and to developing a robust cadre of leaders through a comprehensive programme of development."

"As CEO of Ooredoo Qatar, Sheikh Ali Bin Jabor Al Thani will build on the strong foundations put in place by his predecessors and enable us to continue to innovate and drive value creation in our home market, and we wish him every success in this new role," Fakhroo added.

du Becomes GCF Field Test Qualified Operator to Deploy 5G Network



du, from Emirates Integrated Telecommunications Company (EITC), has become the world's first Field Test Qualified Operator (FTQO) of the Global Certification Forum (GCF) to deploy the 5G common core network. du is steadily creating growth and opportunities for the UAE by supporting enterprises through the leveraging of its 5G network and the enabling of advanced communication services for its customers.

The development is a key milestone as du aims to play a key role in the digital agenda of the UAE and ensure that 5G technology takes the country's tech-driven transformation to the next level by providing "a network that gets you" as it continues to extend its 5G coverage throughout the UAE. Its deployment of 5G networks in 2022 progressed at the

fastest rate since 2021, reaching 94% population coverage by the end of the year.

Saleem AlBlooshi, chief technology officer at du, notes, "du's 5G network is a powerful component of our offering that brings unprecedented services closer to users and will unlock a new generation of use cases. Becoming the world's first GCF Field Trial Qualified Operator to declare 5G readiness is a significant milestone in advancing towards nationwide 5G coverage and transforming the UAE's network landscape. Having already achieved several milestones, we are excited to deliver innovative services to our users, spur future achievements in 5G technology and continue building a foundation for the 5G evolution and beyond."

Furthermore, du has introduced 5G innovations that empower key entities in their respective digital transformation journeys and improve national infrastructure, including those that empower people, build better communities, and support the National

Agenda and other strategic roadmaps such as the UAE Digital Government Strategy 2025. It continues to be a pioneer in 5G and network solutions, transforming individuals' lives and businesses by delivering the best network experiences across the UAE and exploring new use cases to empower a digital transformation that will benefit the various economic and social sectors within the UAE.

In related developments, du will welcome delegates as its hosts the Global Certification Forum (GCF) meetings CAG#73 (Conformance Agreement Group) and FTAG#70 (Filed Trial Agreement Group), from February 7-9, 2023, at the Sheraton Hotel Mall of Emirates. The GCF is recognized globally as the industry standard for mobile device certification and maintains and operates a certification scheme for new mobile devices, including handsets, smartphones, tablets, dongles, MiFis and routers. GCF Certification gives operators confidence in the interworking of newly introduced mobile devices, particularly at a time when technology and market expansion are advancing rapidly.

Vodafone: The First UK Mobile Operator to Offer 5G SA Network



Vodafone has begun inviting customers to join the trial of its 5G standalone (5G SA) network. This is the first time in the UK that customers will be able to partake in a "full" 5G experience.

"This is a very important step forward on the way to creating a digital platform for innovation across every sector of the UK," said Vodafone UK Chief Network Officer Andrea Dona.

The 5G SA trial is a limited, controlled experience that will test and

demonstrate the full potential of 5G to selected customers across the country who are using either a Samsung Galaxy S21/S22 or an OPPO Find X3/X5 Pro smartphone.

Eligible customers who opt into the trial will benefit from the 5G SA network's promise of better reliability, improved battery life and improved coverage.

According to Dona, 5G SA should be viewed as a vehicle for innovation and greater prosperity across the UK. Citing examples, this technology could support an intelligent transport system; a futuristic, digitalized healthcare system; and artificial intelligence that augments human skills.

"This trial is a stepping stone towards this digitally connected ecosystem, which will enable businesses and

public sector organizations to thrive, innovate and improve the lives of people across the UK," added Dona.

Moreover, this recent trial is in line with Vodafone's Digital Ambition 2030 report last year, in which CEO Ahmed Essam commented: "With significant investment across all parts of the country, we can still create an investment-friendly environment that enables all of us to benefit from the next generation of mobile technology... In the years ahead, the UK could also make 5G work for all of our citizens and businesses."

Vodafone will also trial "network steering," a technology that allows the network to direct a device automatically towards the right connectivity (4G or 5G) depending on what services are being used.

The Rise of NetCos



According to the 2022 Mobile Economy Report by GSMA, the number of 5G global connections is predicted to double to 2 billion by 2025. The pace of 5G deployments has overtaken the previous generation of mobile technology, and in a short time, marked progress has significantly impacted network deployment, consumer services and industrial applications.



and rural communities' dependence on high-speed connectivity to access public resources, health care, and social services grows, telcos are increasingly and voluntarily splitting their integrated telco operation into separate businesses referred to as "NetCos" (network operators), "ServCos" (customer-facing entities), "InfraCos" (infrastructure) and "TowerCos" (tower companies). Although not a new concept per se, this business model is proving somewhat effective in addressing the challenges of the current financial and market pressures given the capital-intensive evolution toward 5G and fiber to the home.

Striking Feature of NetCos

For telcos, their network is the biggest generator of revenues, as it allows them to establish a competitive advantage for an extended period of time.

Operating as an independent NetCo allows telcos to offer wholesale access to other operators, resulting in various operational and financial advantages. It can increase its network occupancy by letting multiple service operators use the network. By solely focusing on the network, it can provide specific services to different operators. It can also help them operate efficiently, deploy capacity, provide technical know-how and improve their pricing and quality of service.

"What we see in today's market is that networks are becoming more virtualized, and they are becoming more intelligent. This requires that the OSS platforms that manage those networks also become more intelligent," says Bob Titus, CTO at Netcracker, talking about his company's investment in cloud BSS/OSS solutions that are enabling service providers to sell new services in order to monetize them through the use of new technologies. "Service providers must come up with a new operating model by leveraging agile DevSecOps and other methodologies to become faster and more flexible in terms of how they deploy their solutions and services in the market," adds Titus.

Furthermore, investors are interested in these new branch-out operations rather than a "monolithic" structure of operation that manages everything from acquiring land and building towers to creating consumer apps and running service call centers. In contrast to traditional telcos, NetCos are less controlled by regional licenses and can expand geographically by acquiring telco infrastructure or through new construction.

In the latest development, Zain Group recently announced that its operation in Iraq was inking a 15-year agreement with TASC Towers Iraq for the sale and leaseback of and the management rights to the passive physical infrastructure of its 4,968 tower portfolio in Iraq for \$180 million.

"Zain's '4Sight' strategy aims to create significant value for shareholders through the unlocking of capital and optimization of infrastructure assets, which will flourish under the management of an independent team," explains Zain Vice-Chairman and Group CEO Bader Al-Kharafi in justifying their decision to opt for the independent operating model. This model will essentially focus on providing Zain Iraq with the low-complexity assets that make up the passive infrastructure.

Leveraging Networks

With robust investor support, the leading NetCos are becoming more ambitious, with the potential to be worth 15 to 20 times their margin compared to most traditional telecom operators, which are valued at merely six to seven times their annual operating margin, according to Deloitte.

In considering the independent operation of network functions, a survey by Forrester shows that visibility and integration of security and networking teams are critical to network security. An improved visibility results in improved network security, security response, automated audit and compliance tasks, and better management of the network's performance and capacity planning.

As a result of this rapid advancement in connectivity, accelerated by COVID-induced remote work and long-distance online business activities, the global trends in accessibility, network reliability and user experience have taken a sharp upward turn. As urban

Telcos planning to operate as NetCos would do well to increase their investments in network visibility to better empower their networking and security teams in a cost-efficient manner. Further high-demand, foundational solutions, such as integrated DNS, DHCP and IPAM, can help improve network discovery, visibility, performance and capacity planning.

Guaranteed Returns?

Setting up a network as an independent entity could create value in the following ways; however, proper planning and implementation will remain a detrimental factor.

Regulatory Respite: The separation from the existing market structure can increase retail competition, resulting in some form of regulatory relief as retail price regulation can impact gross margin. With fewer restraints, greater pricing and contracting flexibility may be achieved.

Bigger Market: An independent NetCo can grow its wholesale business with other operators since combining demand from multiple wholesale customers increases household conversion rates, resulting in a higher ROI from new infrastructure construction.

Cheaper Capital: Since NetCo's primary investments are in infrastructure, they have the advantage of attracting long-term investors interested in buying into a physical asset.

Defined Management: NetCos normally plan for a 10- to 15-year timeframe for infrastructure investments that can last for 50 or more years. Strategizing and budgeting can be based directly on the specific company requirements, leading to greater strategic clarity and operating space.

5G Compatibility: There is little doubt that 5G will drive up the TCO of the network given the increased penetration in urban areas, resulting in the need for fiber deployment. A

well-functioning independent NetCo is better positioned to support the industry's need for fiber rollout than an integrated carrier, given the expected network sharing with the onset of 5G.


Planning for Growth:

Despite the apparent possibility of value creation, telcos mulling the idea of leveraging their assets independently must come up with a plan for a smooth business split — a plan where the benefits and setbacks are clearly defined. Most importantly, it must be congruent with the evolution into next-gen infrastructure and services for fiber rollout, 5G, and ecosystem-based businesses. The wrong preconditions may result in higher transaction costs in daily dealings due to price differentiation or a lack of access to integrated operations such as package bundling and cross-subsidization, as certain types of product development warrant deep network integration. Moreover, the adopted regulatory frameworks could impact the independence of ServCo and NetCo operations. Further, the splitting of the once-integrated business will undoubtedly be costly and time-consuming, requiring significant management attention and having the potential to render leadership ineffective, resulting in delayed product development cycles.

Looking Ahead

As more digital-first and cloud-native trends emerge, telcos must provide a seamless experience for consumers and enterprises with new and innovative services. The combination of rapid 5G deployments and powerful computing will empower the digital ecosystem to exponentially expand in sectors such as gaming, education and healthcare, among others. The digital transformation taking place in organizations, including governments, conglomerates and corporations, has opened new opportunities for telcos to operate NetCos to better fit into today's digital fabric. Meanwhile, new open standards, virtualization and cloud-based platforms are making it easier to disaggregate network hardware and software components,

facilitating the way for NetCos to deploy active infrastructure, such as antennas and radio transmission equipment, that can be used by multiple ServCos.

The new wave of value creation will require telcos to become well-rounded, customer-centric providers of connectivity, entertainment and digital services while also driving sustainable growth. Adequate investment in fixed and mobile network infrastructure as well as digital and data platforms could see the NetCo model bear fruit in the years ahead. 



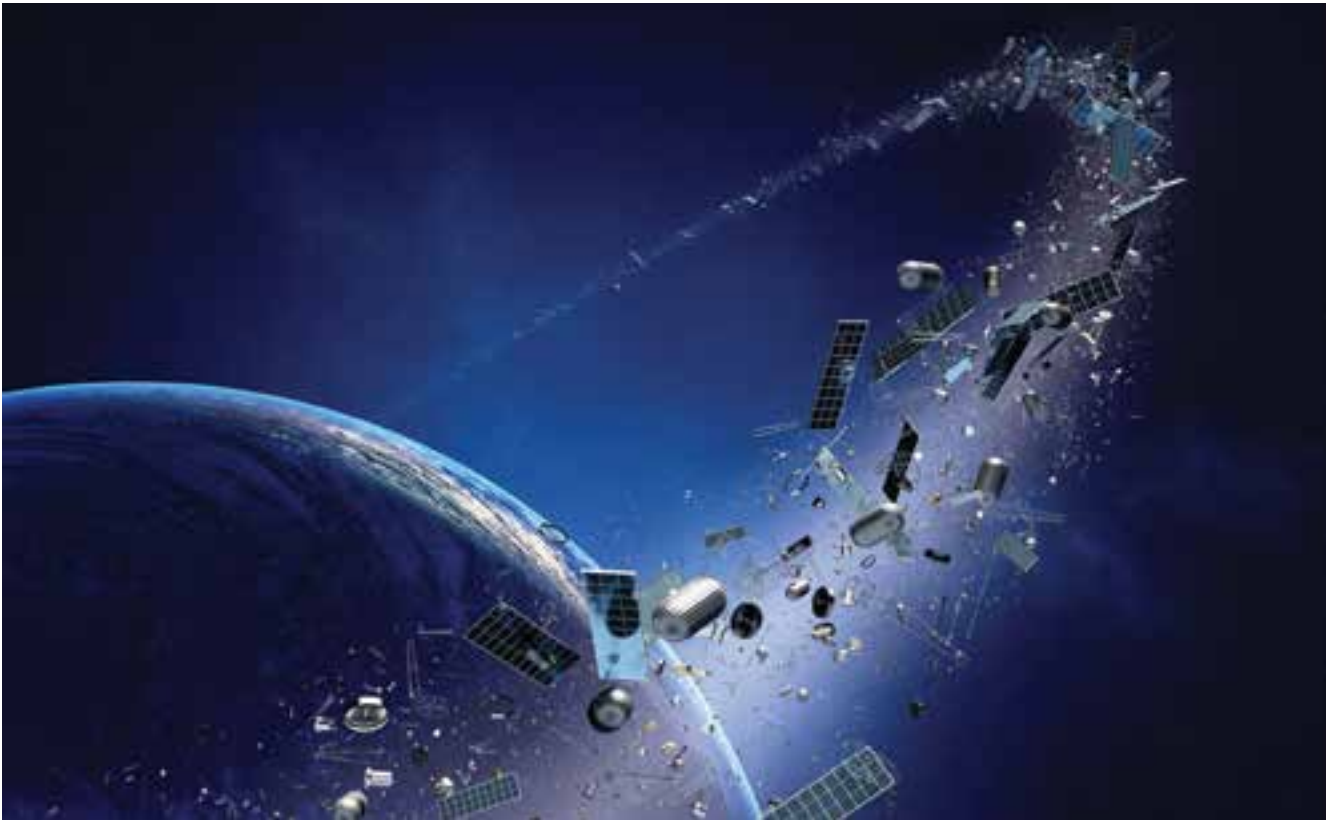
For telcos, their network is the biggest generator of revenues, as it allows them to establish a competitive advantage for an extended period of time





Small Satellites and the Future of Spacetech

In the context of space technology, the earth has significantly benefited from a lot of innovations and advancements related to space, particularly in terms of communications, positioning based on products or services, earth observation based on gathering data about Earth's physical, chemical, and biological systems using remote sensing technologies, and commercial space activity such as direct-to-home satellite television (DirecTV and DishTV), satellite radio (Sirius XM), and commercial communications satellites that transmit voice, data and Internet services (such as Intelsat Ltd., SES Global, and Eutelsat).



Since the launch of Sputnik in 1957, humankind's capacity for space exploration has greatly increased. Over 8,100 space objects have been launched since then, including numerous exploration missions to every corner of the solar system, 135 Space Shuttle flights, the building of the International Space Station (ISS) and human landings on the moon.

Applications of scientific knowledge that are utilized in space to impact our daily lives are included in space technology.

In March, the US announced that it would send astronauts to the Moon permanently in 2024. Many other nations have expressed their desire to reach the Moon. With the explosion of more than 2,000 commercial space companies, including those creating communications satellites, orbital launch vehicles, lunar and mars rovers, orbital space habitats, space manufacturing platforms and space greenhouses, the capacity of

commercial space in nations around the world is rapidly expanding beyond the satellite industry, which has already generated more than \$277 billion in global revenues over the past year. Despite the pandemic, a record number of satellites were deployed into orbit in 2021, which also saw a 44% increase in commercially purchased satellites compared to the previous year.

Although some people remain uncertain about the future of space technology, lamenting the planet's increased potential for self-destruction, space technologies have not only enormously benefited many areas of life but have also deepened our understanding as to the true nature of humanity.

Widespread Use of Small Satellites

When defining small satellites, aka miniaturized satellites, we are typically referring to those under 1200 kg. While all of these satellites can be categorized as "small," different classifications are used to group them further based on mass.

These include minisatellites, microsatellites, nanosatellites,

picosatellites, and femtosatellites and are divided according to weight. Commercial companies, nonprofit organizations and educational institutions can conduct their missions in the lower Earth orbit using these small satellites because they are an affordable alternative.

The widespread use of small satellites for communication and navigation is the result of rising demand for cutting-edge technologies like over-the-top (OTT) services and Internet Protocol Television (IPTV). Such deployment is boosting the global market as well.

Furthermore, the growing global small satellite market also influences the enormous and growing demand for earth observation and remote sensing services across many sectors, including energy, oil and gas, defense and agriculture.

Opportunities Originating from Small Satellites

Broadly speaking, small satellites are consistently positioned in lower orbits, thus decreasing signal attenuation between the satellite and the ground.

Compared to a satellite at 850 km, communication with a satellite at 500 km requires nearly a third of the transmission power.

Moreover, small satellite constellations – a group of artificial satellites working together as a system – can access potentially higher resolution for site-specific software. Because of the presence of clouds, analysis of high temporal resolution optical imagery is often constrained. Some of these issues have been resolved by the creation of temporal gap-filling techniques as well as the combination of Copernicus optical and radar products.

Furthermore, given the fact that there are more sensors available on small satellites, they may also be able to gather data across more spectral bands. In the case of mapping plant species and plant diversity from space, for instance, it is possible to track invasive species using the data gathered by hyperspectral imaging sensors. Only a small number of missions, like PRISMA, currently have access to hyperspectral data. Therefore, the creation of small satellite constellations with hyperspectral sensors would significantly enhance our capacity to track how environmental change affects biodiversity and the delivery of ecosystem services.

While there are continuing challenges in space exploration, including those specific to small satellites, opportunities abound. To date, seizing such opportunities has been the purview of a few, but this is slowly changing. Traditionally, national agencies that had sufficient manpower and finances pioneered space efforts. The same can apply to the maximization of small satellite opportunities.

Focus of Upcoming Research

A mission architecture consisting of a large number of satellites is called a distributed satellite system. The mission planning of a large-scale, distributed satellite system offers improved real-time, continuous global coverage and greater flexibility

compared to that of a single satellite. In the aerospace industry, large, expensive satellites are steadily being replaced by small, affordable, mass-produced versions. For example, the SpaceX project helmed in the United States aims to put about 12,000 satellites into orbit between 2019 and 2024, of which 1,584 will be placed in Low-Earth orbit, 550 kilometers above Earth. The sheer scale of satellite systems presents a new set of major challenges to mission planning for the entire system. Large restrictions make it difficult to accurately utilize traditional programming models. The algorithm's size, execution time and solution efficiency all increase due to the exponential growth of data. Therefore, the challenge ahead is to determine how to plan missions for large, distributed satellite systems.

Moreover, the majority of satellites currently in use receive mission planning from the ground and are only able to carry out the task instructions that have been uploaded from Earth during their deployment. The actual operation of the satellite will, however, face a number of unknown issues. Weather changes, for instance, can have a significant effect on the function of the optical reconnaissance satellite. If it carries out a fixed task while being obstructed by clouds, it will fail to complete the objective and use up observational resources in the attempt. If a satellite component fails while it's in operation, the load interruption will not necessarily affect satellite operation but may alter the satellite's earth observation, and the mission will still fail due to the limits of the original mission instructions.

Small satellites are currently altering the economics of space. These spacecraft utilize cutting-edge commercial off-the-shelf (COTS) technology, enabling creative and less expensive methods to carry out valuable observational missions.

Synthetic aperture radar (SAR) is a technique for extracting high-resolution images from a resolution-limited radar system, and hyperspectral imaging missions on minisatellites are currently in planning

and will soon be fully operational. The thermal stability of the imaging instrument, which is necessary to produce sharp imagery, can be a significant obstacle for high-resolution imaging missions or for hyperspectral missions on small spacecraft. Technologies like SAR aim to surmount such limitations.

Small satellites will undoubtedly be a part of the future remote sensing conservation toolbox. When teamed with current commercial and civilian programs, such satellites could increase data resolution and accessibility, significantly enhancing the precision and power of monitoring wildlife and natural resources. However, sufficient regulatory frameworks, related systems and technologies must be "in place" before the application of this technology really takes off. Only then can ecologists maximize its true potential. **TR**



Small satellites
are currently
altering the
economics of
space





On the World Wide Web, It's a Must to Be Cyber Smart

The Internet is the core enabling element of a digital nation. Because the World Wide Web is borderless, securing the diverse digital assets available on it is critical, as cyberattacks can occur from anywhere at any time, by known and unknown parties.

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All members of society — be they enterprises, governments or end users — are gathering, storing, processing and transferring vast amounts of data online on a daily basis. As a result, cybersecurity threats evolve rapidly as the scope of the Internet expands. In the beginning, nobody needed internet security, but as malware, ransomware and other kinds of malicious viruses became prevalent, the problem emerged and became increasingly global.

In this world of constant interconnectedness, online security is paramount because the cost of cybercrime worldwide has become massive. Figures revealed so far show that such a detrimental price tag will increase by 15% annually over the next five years, and by 2025, that cost will reach \$10.5 trillion annually.

Truth be told, we are never going to be free from risks in the digital world. No system or tool has been proven to be perfectly impenetrable by attackers. Security weaknesses are targeted by malicious actors, mostly to exploit identities and get money.

It is a no-brainer that protecting oneself online is difficult, similar in complexity to securing homes and other physical premises. Whether it be our names in our email, bank account information, browsing history or any other data exposed online, we must protect ourselves proactively and become cyber smart.

Challenges to Focus On

In terms of Internet usage, there are key challenges that are currently being addressed and must be consistently managed in the future to ensure a safe digital experience.

• Enhancing data privacy

Data privacy breaches on the internet pose real dangers. The collecting, storing and sharing of your data without consent could give third parties access to your private information or, worse, allow them to

steal your identity. A basic step to protect against this is to make sure that your communications are secure while the data is in motion. This is applicable whether you're surfing the web, sending an email or using a navigating tool on your phone or laptop.

We must understand thoroughly that online privacy and security go hand in hand. Many scholars are now referencing this era as the "digital surveillance economy," where a new business model is powered by the acquisition and consolidation of very large volumes of personal data in order to target advertisements, manipulate consumer behavior and drive the prices of goods and services at the highest level. With minimal effort, users are often induced to make their data readily available.

This datafication process has made tracking and internet surveillance easier for hackers. Yet thanks to new technologies and software, there are unprecedented ways to monitor these activities and prevent further damage.

• Improving cybersecurity

In a world that relies on the Internet, cybersecurity is king. By now, cyberattackers have become true innovators as they have managed to advance their approach to infiltrating systems. In order to defend ourselves, we must keep pace with new technological advancements. Innovations in cybersecurity are laying a new foundation of defense against unwanted attacks.

The first focus is Artificial Intelligence (AI). While automation provides detection of any wrongdoings, it can also safeguard the target areas. The tracking of logs, transactions and real-time data to discover threats and anomalies is an exemplary utilization of AI. Moreover, an examination of behavioral analytics can discern trends, patterns and habits in each user's workflow to indicate possible cybersecurity issues.

One of the most currently discussed cybersecurity topics is the zero-trust model, which requires all users to be

authenticated and authorized before accessing any data or resources. As an internal precaution, it gives the same priority to guarding against external attacks and includes identifying and mapping critical data flow, logical and physical segmentation, and constant endpoint monitoring.

It is essential for cybersecurity professionals to be innovative since we're moving to a digitally enabled future. By providing better security on the network, we can accelerate our innovation journey in an efficient and sustainable manner.



In terms of Internet usage, there are key challenges that are currently being addressed and must be consistently managed in the future to ensure a safe digital experience



• Ensuring the global free flow of information

2022 was a tough year when it came to cybersecurity, from Russia's cyberattacks on Ukraine to alarming hacking scenarios in other parts of the world. In fact, according to new data, global cyberattacks increased by 38% in 2022.

These cyberattack numbers were driven by smaller, more agile hackers and ransomware gangs that focused on exploiting collaboration tools used mostly in work-from-home environments. The COVID-19 pandemic has heavily impacted how information is transmitted as well.

With this in mind, this increase in global cyberattacks also stems from hacker interest in healthcare organizations, which saw the largest increase in cyberattacks last year.

Geographically speaking, Africa experienced the highest volume of attacks, with 1,875 weekly attacks per organization, followed by APAC with 1,691 such attacks. North America (+52%), Latin America (+29%) and Europe (+26%) also showed a surge in cyberattacks in 2022.

Both the public and private sectors are working on either removing limitations on the information flow within their territories or restricting the data flow to protect citizens' data. Headlines regarding these various data manipulations and breaches further impact these steps and require stronger policy enforcement for the benefit of all online users.

Take Responsibility for Online Security

In order to improve cybersecurity on a national scale, the first step is to encourage individuals to take responsibility for their own online security. Individual citizens need to be cyber smart by increasing their capabilities to be active and engaged netizens.

For websites, the quickest thing that can be checked to ensure safety is the padlock symbol next to the URL and the use of HTTPS. Additionally,

red flags such as too many pop-ups and ads, selected payment methods, non-existent privacy or return policies, search engine warnings, illogical texts and weird pictures shouldn't be disregarded.

It is also vital to conduct cyber awareness training, especially at the workplace, to avoid vulnerable activities such as clicking on malicious links or revealing personal or sensitive data and to encourage safeguards such as the verifying of files or software before downloading and the use of a VPN when connecting via untrusted networks.

Keeping computers and servers up-to-date and applying security patches can also help limit an organization's vulnerability to ransomware attacks. It is important to remember that prevention is better than detection. With the right set of technologies in place, most attacks, even the most sophisticated ones, can be prevented without disrupting the normal business flow.

Create a Secure Digital Environment in the Middle East

Countries in the Middle East have been successful in their digitization initiatives, but with this focus comes inherent exposure to cybersecurity risks. A suggested strategic approach to national cybersecurity should follow a "CCC" framework: comprehensive in nature, collaborative by intention and capability-driven.

Mohamed al-Kuwaiti, head of government cybersecurity for the United Arab Emirates (UAE), previously warned that the Middle East was facing a "cyber pandemic." The Gulf States have been the main targets for attacks in the region as they transition to technologies such as the Internet of Things, Artificial Intelligence and blockchain, each of which can be infiltrated by malware and other cyber threats.

National visions and initiatives must continue to be implemented in order to prevent suspicious actors from exploiting the vulnerabilities created

by a dependence on these emerging digital technologies.

The establishment of a safe and secure environment for existing and future digitization initiatives in the Middle East is a challenging undertaking, but with the influence and action of various stakeholders from the public and private sectors, the journey toward proactive and effective prevention and mitigation of cyberattacks can effectively be achieved. ■



National visions and initiatives must continue to be implemented in order to prevent suspicious actors from exploiting the vulnerabilities created by a dependence on these emerging digital technologies



etisalat by e& Teams Up With Huawei to Launch Mobile Private Network



Etisalat UAE, branded as etisalat by e&, announced the successful deployment and testing of 5G Portable Private Network MEC (Multi-access Edge Computing) functionality as part of a collaboration with global ICT leader Huawei Technologies.

This successful showcase is part of the Stand-Alone 5G and MEC commercialization program and enables etisalat by e& to offer a 5G-based replacement for traditional VPN, enhancing remote work experience (reach workspace anywhere, anytime) for UAE enterprises. Remote work and long-distance learning represent global trends with significant implications for accessibility, network reliability and user experience. Urban and rural communities also depend on highly accessible networks for high-speed connectivity to public resources, from health care to social services.

Both accessible and convenient, a 5G Portable Private Network solution enables seamless switching between public and private networks to accelerate data delivery and boost security for services in every area of the economy.

Khaled Al Suwaidi, SVP of core networks and platforms, at etisalat by e&, said: "This deployment and testing will play a crucial role in providing a seamless experience for consumers and enterprises by enabling new and innovative 5G services in public safety, gaming, education and healthcare among others. This is in line with our long-term vision to ramp up digital services, elevate a digital-first lifestyle at the same time enable the digital transformation of governments, large enterprises and corporates. The partnership with Huawei Technologies and our investments in standalone 5G earlier this year has supported our vision to enable and empower the enterprise digitalization ecosystem enabler and facilitator."

Gavin Wang, head of Etisalat key account at Huawei Technologies, said: "Huawei is pleased to be an entrusted 5G SA vendor of etisalat by e& and

to be able to demonstrate what this latest 3GPP Rel-16 technology has to offer. We are proud to continue supporting etisalat by e& to realize its digital transformation objectives and, in particular, its vision to bring the best in smart connectivity and innovative digitalized solutions to its customers."

Traditional networks exchange data via the Internet and face various problems in doing so. Moreover, remote users typically encounter latencies and bandwidth limitations that impede processing, causing delays and interruptions. Remote access using a 5G Portable Private Network avoids the time-consuming terrain that is the Internet and eliminates those latencies and performance drawbacks. Once a 5G Portable Private Network is in place, remote end users can seamlessly access corporate intranets from anywhere, at any point in time. They can enjoy increased reliability and excellent online experiences because they can avoid repeated logins, connection latencies and data risks. These users also have the freedom to use their personal devices for improved, faster connections, enhancing productivity while protecting data exchanges.

Building Diverse Global Talents: AWS re/Start MENA Completes First Year



Amazon Web Services (AWS) is celebrating the successful first year of AWS re/Start, a no-cost, cohort-based workforce development training program that prepares individuals for careers in the cloud and connects them to potential employers.

Currently operating in 180 cities across 60 countries worldwide, including

Saudi Arabia, Egypt, Jordan, Bahrain, Qatar, Lebanon, Tunisia, Iraq and Palestine, the program is part of AWS's effort to train 29 million people in cloud computing skills by 2025 and connects participants with employment opportunities with local employers.

AWS re/Start is a unique curriculum that provides no-cost cloud skills training that supports learners in building a skill set that aligns with the needs of some of the region's most in-demand tech jobs. Through coursework and hands-on labs using real-world scenarios, learners can

gain the technical skills they need for cloud roles. AWS re/Start works with different collaborating organizations across the MENA region that share its mission of building a diverse global pipeline of entry- to mid-level trained talent.

AWS re/Start curriculum is adapted to meet learners where they are in their learning journey, with desired objectives and learning modalities. Through scenario-based exercises and instructor-led sessions, learners build Linux, Python, networking, security, databases, automation and core AWS Cloud skills.

Year of Acceleration: Nokia Achieves Triple-Digit Growth in 2022



"We said at the start of 2022 that it would be a year of acceleration, and we delivered what we promised," announced Nokia President and CEO Pekka Lundmark.

Nokia reported better-than-expected revenue and profit last year, soaring to 4.3 billion euros in 2022, a 159% jump from the previous year. Moreover, annual net sales grew 12% to 24.9 billion euros.

The company's fourth-quarter net profit alone surged to 3.15 billion euros, a 364% increase from the same period in 2021, while net sales grew by 16% from 6.4 billion euros to 7.4 billion euros.

With a 27% YoY change, enterprise customers are the largest contributors to the net sales growth of Nokia in 2022.

Moving into 2023, Nokia expects to see solid demand trends continue in its Network Infrastructure and Mobile Networks segments. Last year's Q4 results showed stellar Network Infrastructure performance, which grew net sales by 20%, while Mobile Networks' Q4 net sales increased by 7%.

Notably, there is a strong full-year acceleration in Fixed and Submarine

Networks businesses, with net sales growing 25% and 24%, respectively.

In the Cloud and Network Services segment, the increased investments into private wireless and Software-as-a-Service (SaaS) brought in a Q4 net sales growth of 10%. From a regional point of view, the Middle East & Africa (MEA) growth of the telecom vendor was driven by this segment.

In terms of circular practices, Nokia announced the opening of a new regional maintenance hub in Riyadh, Saudi Arabia, during Q4 to support customers across MEA. The hub will provide repair and support services for Nokia's 5G and legacy telecom network equipment, as well as the training of local engineers.

Cisco's Top 7 Focus Areas for CISOs in 2023



Cisco's CISO Advisories experts are sharing key topics to keep in mind when CISOs prepare to reduce cybersecurity risks this year.

Getting the Basics Right

There are more sophisticated attacks, scarcity of resources, the challenges of communicating effectively with the board, and more demanding, regulatory drivers being implemented rapidly within the region.

With so much to consider, it is vital that CISOs have a clear understanding of the core elements of what they protect. Questions like 'where is the data?', 'who is accessing it?', 'what applications is the organization using?', 'where and what is in the cloud?' will continue to be asked.

Increasing Demands from Insurers

Cyber insurance or coverage plays an increasingly vital role in risk management strategy in the Middle East. Cyber insurance provides financial protection

that enables innovation and risk taking in digitization. The topic will continue to be in focus this year.

How Zero Trust Will Progress

Zero Trust implementation is a long journey that takes multiple years for major enterprises to carry out, so it is vital that they start as they mean to go on. However, that can be easier said than done in many cases, as the principles within Zero trust fundamentally turn traditional security methods on their head, from protecting from the outside in to protecting from the inside out.

Dealing with Ransomware

Ransomware continues to be the main tactical issue and concern facing CISOs. More specifically, the uncertainty around when and how an attack could be launched against the organization is a constant threat.

From Security Awareness to Culture Change

There is increased discussion now about the limited impact of the test phishing emails.

For the most effective security awareness, culture is key. This means that everyone

should see themselves as part of the security team, like the approach that has been taken when approaching the issue of safety in many high-risk industries.

Resignations, Recruitment and Retention

With Hybrid work becoming the norm rather than an exception, not having flexible infrastructure can deter the best talent from joining or staying within an organization. Overly restrictive security practices, burdensome security with too many friction points, and limitations around what resources and tools can all contribute to this factor.

Don't Sleep On the Impact of MFA Fatigue

Just when we thought it was safe to go back into the organization with multi-factor authentication (MFA) protecting us, along came methods of attack that rely on push-based authentication vulnerabilities including:

- The barrage of push notifications
- Push Fatigue

In the forthcoming year CISOs will look to update their solutions and introduce new ways to authenticate, along with increased communications to users on the topic.



Industry 5.0: A Humanistic and Sustainable Transformation

The digital transformation era is opening new horizons by placing humans at the center of innovation, fostering resilient operations and striving for a greener tomorrow.

The ongoing fourth industrial revolution, where machines are dominating the industrialization scene, is being challenged by the

concept of bringing people back to production and letting humans and machines work collaboratively.

The concept of Industry 5.0 aims to reverse the dehumanization of the industry and address the challenges

associated with human-machine interaction and skills-building. The crucial role of man in society is amplified as an important factor that can lead to sustainable development. Thus, Industry 5.0 makes production more competitive in the long run by integrating three core elements: humanity, sustainability and resiliency.

Perhaps the greatest takeaway from the Industry 4.0 era was the understanding that technology alone does not work. Instead, the levels of collaboration between people and machines will strengthen with automation and machine intelligence, including robots working in support of the human workforce or manufacturing output.

In its entirety, Industry 5.0 reflects a shift from focusing on social economic value and strictly individual welfare to instead promoting overall well-being.

Cornerstones

It is evident that Industry 5.0 complements and extends the current Industry 4.0 paradigm, putting the advances in digitization, information systems and automation at the service of society. With real collaboration between machines, people and companies, a more global, integrated and innovative long-term vision can

be fulfilled. Once organizations adapt to becoming more human-centric, resilient and sustainable, we can expect better solutions to emerge.

- **Human-Centric**

The vision of an innovative, resilient, socio-centric and competitive industry has been labeled as Industry 5.0. This era's products and services are personalized and respond to human needs. Instead of the mindset that technology will replace humans, Industry 5.0 reiterates that there will be a fusion of skills between humans and technology for the mutual benefit of industry and industry workers.

Stimulated by Industry 4.0, Society 5.0 is envisioned to have humans at the center of innovation, technological transformation and industrial automation. People are known as multitaskers with a good sense of reasoning and empathy. On the other hand, machines can augment these skills, identify pattern recognition and assist in automating repetitive and time-consuming tasks.

In reality, not everything can be automated. This is where the debate over human factors comes into play in cases like autonomous cars, as the power of human cognitive and analytical capabilities remains irreplaceable. Rather than thinking of what we can do with new technology, we should consider what the technology can do for us.

By refocusing the process on the workforce and the customer, we can adapt existing technology to become more flexible and conformable, creating agile solutions. The key to Industry 5.0 success is not the technology but rather the people who use it.

With this in mind, attracting and retaining talent has become a considerably more important undertaking; putting the user at the center of industrial tech adoption can address labor demands and fully leverage human potential.

As a result, we can reposition human workers in manufacturing from assembly line processes and other

repetitive tasks to more creative assignments that require their skills in problem-solving and intuition.

Industry 5.0 requires the proper training, foresight and implementation that will best equip workers with the knowledge to use the new technologies. Industry 5.0 principles and technologies provide a more progressive and interesting working environment that can lead to increased employee satisfaction and company loyalty.

- **Resilient**

In industrial production, being resilient refers to the robustness of operations – the certainty that they can withstand any possible disruptions and provide and support critical infrastructure in times of crisis. Geopolitical shifts such as the ongoing Russia-Ukraine war and health pandemics like COVID-19 highlight the fragility of current global supply chain production.

Industry 5.0 technologies are playing an important role in the development of industrial agility and resilience through comprehensive data gathering, flexible processes, automated risk analysis and enhanced security.

It is a must to have a fully-functional value chain at all times, particularly in verticals that serve basic human needs. The massive scale of supply chain disruption we have observed recently has made it clear that manufacturers should prioritize operational resilience moving forward.

- **Sustainable**

Industry 5.0 helps people understand that technology is essential to developing and engaging in sustainable practices, protecting the world's ecosystems and making the best use of available resources.

Developing circular processes that involve reusing, repurposing and recycling can positively impact the environment. Sustainability means reducing energy consumption and greenhouse emissions, and technologies like AI and additive manufacturing can play a large role here.

ESG corporate responsibility goes beyond taking steps to reduce negative environmental impacts and suggests that their manufacturers become part of the solution. The production of devices and equipment should be done in a sustainable manner for maximum cost-efficiency and eco-friendliness.

As organizations' digital systems become more robust and modular, they will have the flexibility to choose more sustainable options. The adoption of Industry 5.0 practices that maximize the time, energy and efforts of both humans and machines will promote the economic performance of industries while ensuring environmental sustainability.



The concept of Industry 5.0 aims to reverse the dehumanization of the industry and address the challenges associated with human-machine interaction and skills-building



Enablers

As the post-pandemic period unfolds for us, the concept of Industry 5.0 is gaining parallel momentum. Seen as the future of industrial automation, the technological side of robots, smart machines, IoT, AI and big data is balanced with more focus on sustainability, resilience and the enhancement of human talent.

According to the European Commission, human-centric solutions and human-machine interaction, as well as bio-inspired technologies, support the Industry 5.0 concept. These include, but are not limited to, digital twins, collaborative robots, VR/AR, automatic speech and gesture recognition and tracking devices.

Humans working alongside smart machines require and generate a large amount of data. Because of this, the adoption of 5G and the cloud will grow exponentially, transforming the way business is done around the world.

Without a doubt, connectivity is at the heart of Industry 5.0. Advanced automation will be supported by high-speed data exchange and seamless

integration of technologies. This generation of evolved machines is equipped with sensors, actuators and AI-powered controllers that allow them to work next to humans in a safe and harmonious manner.

5G networks can support the use of advanced robotics and AI in manufacturing, as well as the use of remote and mobile technologies to be more responsive to changing market conditions.

More importantly, by enabling faster and more reliable communication and data transfer, 5G can help manufacturers optimize their operations and increase overall productivity.

On the flip side, smart manufacturing utilizes the cloud for robust access control and usage of manufacturing resources across various places. The industrial cloud is a virtual environment that provides a supportive environment for applications and APIs. As edge computing becomes more prevalent, the amount of data transferred to the central server lessens, thus improving efficiency

and augmenting the storage for other industrial activities. **TR**



Once organizations adapt to becoming more human-centric, resilient and sustainable, we can expect better solutions to emerge



ITU Sets Up Focus Group for Open and Inclusive Metaverse

The International Telecommunication Union (ITU) has established an expert focus group to explore international technical standards for the metaverse.

The focus group offers a venue to start laying the groundwork for technical standards that can help create an underlying technology and business ecosystem that encourages market entry, innovation and cost efficiency in a sector expected by some industry analysts to grow to a value of nearly US\$800 billion by 2024.

"The metaverse and its layers of technologies can help human development and progress," said ITU Secretary-General Doreen Bogdan-Martin. "The work of this ITU focus group is the first step in ensuring that these technologies work well and that they work for all. The benefits of the metaverse should be shared broadly and equitably, and the risks should be well understood and addressed."

ITU, the United Nations' specialized agency for information and communication technologies, is mandated by governments to expand

digital connectivity and promote sustainable digital transformation.

The ITU focus group aims to develop a roadmap for setting technical standards to make metaverse services and applications interoperable, enable a high-quality user experience, ensure security and protect personal data.

"Standards development must be driven by everyone that will rely on the resulting standards," said Seizo Onoe, director of the ITU Telecommunication Standardization Bureau. "This focus group will support our work together to envision technology use cases for the metaverse, determine the associated technical requirements and develop standards that help meet these requirements on a global scale."

ITU focus groups, open to all interested experts, accelerate standardization by leading intensive studies in areas of rapidly evolving strategic importance. The metaverse focus group will be active for one year and will conduct "pre-standardization" work as a basis for developing new ITU standards.

MTN Named Best Mobile Network in South Africa for 2022

Research shows that MTN was the best mobile network in South Africa for 2022. While the country had an average mobile download speed of 49.19 Mbps (and an average upload speed of 14.15 Mbps) last year, MTN had the highest average download speed at 68.84 Mbps, followed by Vodacom at 48.58 Mbps, Telkom at 28.54 Mbps, Cell C at 23.41 Mbps and Rain at 15.14 Mbps.

Moreover, MTN also had the best network in Tshwane, Cape Town, Johannesburg, Bloemfontein, eThekweni, Mangaung, Nelson Mandela Bay and Ekurhuleni. MTN's winning performance results from its

outspending its rivals on infrastructure investment over the past five years. However, Vodacom has started spending more than MTN over the last two years, which is beginning to bear fruit in the latest results.

There was a sharp increase in 5G tests in 2022 as operators expanded their 5G footprint to more locations across South Africa. The speed test results also revealed that extreme load-shedding toward the end of 2022 caused unstable connections among all operators. Mobile operators are now investing in improved batteries and backup generators to mitigate the effects of prolonged power outages.

AT&T CEO: 2022 Is the Most Profitable Year Ever for Our Mobility Business

AT&T Inc reported fourth-quarter results that showed sustained momentum in customer additions across 5G and fiber and solid growth in wireless service and broadband revenues.

Focused on growing customer relationships, in 5G Wireless, there were 2.9 million postpaid phone net adds while there were 1.2 million AT&T Fiber net adds.

Speaking during AT&T's fourth-quarter earnings conference call, CEO John Stankey said: "Our growth was not only robust but profitable with 2022 being the most profitable year ever for our mobility business. We expect profit growth to continue in 2023 as we benefit from the investments we've made in our business over the last 2.5 years."

Zooming in on this, AT&T's mobility revenues were up 1.7% YoY to \$21.5 billion due to higher service revenues. Service revenues were \$15.4 billion, up 5.2% due to the subscriber and postpaid ARPU growth.

Domestic wireless service revenues are up 5.2% while consumer broadband revenues were up 7.2% driven by AT&T Fiber revenue growth of more than 31%.

"The financial benefits of our fiber focus are also becoming increasingly apparent as full-year fiber revenue growth of nearly 29% has led to sustainable revenue and profit growth in our Consumer Wireline business," added the CEO.

Airbus' HAPS Becomes AALTO HAPS, Open to Investors

Ahead of Zephyr's commercial service launch by the end of 2024, Airbus' high-altitude platform station (HAPS) connectivity business has unveiled its new brand, AALTO HAPS (AALTO), with the tagline "The Future is Stratospheric."

AALTO HAPS CEO Samer Halawi commented: "A new stratospheric age has begun. AALTO's Zephyr aircraft is the only HAPS platform that delivers long-lasting, environmentally-friendly, low-latency 5G Direct-to-Device (D2D) connectivity solutions, allowing MNOs to extend their coverage in a profitable way to rural and remote areas."

Airbus is reportedly seeking external investments for its HAPS program to scale the business and accelerate its commercialization. The French company has tapped Morgan Stanley to find external partnerships for the new business unit, which is now at its final design stage.

The solar-powered Zephyr drone is designed to linger at an altitude of about 70,000 feet (21 kilometers), which is above weather and commercial planes but below conventional satellites. It can run for months at a time for surveillance or provide a temporary boost to communications.

"Our earth observation solutions will support the management of forest fires, the protection of borders, and will enable precision agriculture, amongst other applications," Halawi added.

Zephyr has established itself as the world's leading HAPS platform, and at present, it remains the only fixed-wing HAPS to have proven day and night longevity in the stratosphere, after a test flight in 2022 managed an impressive 64 days in the sky.

AWS Launches New Asia Pacific Region in Melbourne

AWS has launched the AWS Asia Pacific (Melbourne) Region, its second in Australia, to allow developers, startups, entrepreneurs and enterprises, as well as government, education and nonprofit organizations, to run their applications and serve end users from AWS data centers located in Australia.

By 2037, AWS plans to invest an estimated \$4.5 billion in Australia through the AWS Asia Pacific (Melbourne) Region. The launch of the AWS Asia Pacific (Melbourne) Region will enable local customers with data residency preferences to store data securely in Australia while providing customers with even lower latency to drive greater productivity, more efficient business operations and enhanced real-time application performance.

Customers will also have access to advanced AWS technologies to drive innovation, including compute, storage, networking, business applications, developer tools, data analytics, security, machine learning and artificial intelligence.

"Australia has a strong history of technical innovation, and the launch of a second AWS Region in Australia provides even greater resilience and enables more customers to develop cloud-based applications that help fuel economic development across the country," said Prasad Kalyanaraman, vice president of Infrastructure Services at AWS. "The AWS Asia Pacific (Melbourne) Region adds to our ongoing infrastructure expansion and investments in Australia since we launched the AWS Asia Pacific (Sydney) Region in 2012. We are proud to deepen our investment by driving local job creation, building cloud skills and creating opportunities for growth and collaboration with our local customers and AWS Partners."

"We know how important access to secure cloud infrastructure is to Victorian businesses, and providing more choice will deliver a boost to the economy, support innovation, and help to create new jobs locally," said Victorian Minister for Trade and Investment Tim Pallas.

The World's First AI-Powered 'Robot Lawyer' Gears Up for Court

Global tech ambitions drive use cases for maturing technologies such as artificial intelligence (AI), and one startup is willing to pay US\$1 million to put their AI chatbot to the test in an actual courtroom.

Referred to as the world's first "robot lawyer," DoNotPay's AI chatbot is set to make history as the first AI to defend a case — fighting a traffic ticket — in court. Technically, electronic devices such as smartphones and earphones are not allowed in hearings.

As part of an advocacy move, the firm's founder, Joshua Browder, explained that the court proceeding will take place in a location that will consider the wireless earphones as a hearing aid.

Through the device, the AI chatbot will give prompts to the defendant on how to best argue their case against a speeding ticket. The landmark case is designed as a test for DoNotPay's AI-powered services, and they will shoulder any fines incurred if the case is lost.

DoNotPay has already used AI-generated form letters and chatbots to help people secure refunds for in-flight Wi-Fi that didn't work, as well as to lower bills and dispute parking tickets, among other issues. According to the CEO, they have won more than 2 million customer service disputes and court cases on behalf of individuals against institutions and organizations.

China Moves to Take Further Control Over Tech Giants

China is seeking a greater role in overseeing the country's powerful tech companies, particularly Alibaba, considered the "Amazon of China." A venture on Tencent, the developer behind the dominant social media and messaging app, WeChat, is also reported to be in the works.

The government is securing small equity stakes — or "golden shares" — in the local operations of big tech companies, such as the recent case with TikTok owner ByteDance.

The Communist Party is known for gaining the upper hand when it comes to broadcasting content to people. The stakes, usually involving a 1% share of internet groups' key entities, also indicate having special management shares that give government-backed funds or company-board representation for

key business decisions. This means of investment has been common in the country since 2015, with the intention of exerting influence over private news and content companies.

According to Chinese business records, an entity under the Cyberspace Administration of China's (CAC) state investment fund took stake in an Alibaba digital media subsidiary in order to tighten control over content from its streaming video unit Youku and web browser UCWeb.

China has ambitious economic growth targets, driven by tech advancements and innovation. Recent policy changes relating to the tech sector are helping industrial tech players to outperform consumer tech, intensifying the quest to become a tech superpower and doubling the country's GDP by 2035.

Philippines' Longest Fiber Cable Project to Finish in April

Globe Telecom has announced that the \$150 million Philippine Domestic Submarine Cable Network (PDSCN) is on track for completion in April this year.

Globe said this construction, the longest of its kind in the country, will further boost digitalization throughout the countryside as part of a fresh round of cable landings set for this year.

For the project, Globe partnered with Eastern Communications and InfiniVAN Inc. to provide equitable and reliable connectivity across the country, including previously unserved and underserved areas in the Philippines.

PDSCN, which has a total cable distance of 2,500 kilometers, will soon kick off landing cables in nine remaining segments that cover 13 sites.

The project launched in Subic Bay, Zambales, in July 2022 and has already completed 15 segments across the country, including key cities and tourist destinations.

"As the Philippines continues to build a digital economy, Globe is steadfast in its efforts to bring fast and reliable connectivity to all. We are committed to supporting the government's initiatives towards innovation, e-governance and greater digital adoption among Filipinos through our investments in PDSCN and other network infrastructure," said Globe Group President and CEO, Ernest Cu.

The PDSCN project is part of Globe's network expansion, which aligns with its commitment to improving infrastructure and foster innovation towards development under the United Nations Sustainable Development Goals.

Verizon Enters 2023 With Momentum in Wireless Mobility and Broadband

Verizon closed 2022 with fourth-quarter results marked by wireless service revenue growth and the highest total wireless retail postpaid net additions in seven years.

"We delivered on the operational expectations and financial targets that we set in the second half of 2022," said Verizon Chairman and CEO Hans Vestberg. "We are rapidly building out our C-Band spectrum with the most aggressive network deployment in our company's history and are well positioned to improve and accelerate our performance. Wireless mobility and nationwide broadband will be two of the most significant contributors to our growth for the next several years."

Verizon's total consolidated operating revenue for full-year 2022 amounted to \$136.8 billion, up 2.4% year-over-year (YoY). During the fourth quarter alone, the leading telecom operator recorded a net income of \$6.7 billion, an increase of 41.4% compared to Q4 2021.

Verizon's total wireless service revenue hit \$18.8 billion, a 5.9% YoY increase. Full-year 2022 retail postpaid net additions were 2,605,000, an increase of 23.2% from full-year 2021. This success was driven by strong fixed wireless momentum, tablet and wearables adoption and sequential improvement in phone net additions.

Total broadband net additions of 416,000 was the best total broadband performance in over a decade, reflecting a strong demand for Fios and fixed wireless products.

MWC Barcelona

MWC Barcelona is a dazzling, future-facing reflection of our connectivity ecosystem, one that unleashes the convergence of technology, community, and commerce. Join us and experience our world in a new light

Place: Fira Gran Via, Barcelona, Spain



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FEBRUARY - MARCH

Capacity Middle East

The largest carrier meeting for the Middle Eastern region will once again unite the region's key ICT players.

Place: Grand Hyatt Dubai, UAE



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MARCH

GISEC Global

GISEC Global brings together the leading ecosystem leaders to anticipate the next major movements, threats, innovations and strategies that will strengthen cybersecurity across organizations, industries and economies.

Place: Dubai World Trade Centre, UAE



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MARCH

FutureNet MENA

FutureNet Middle East & North Africa is dedicated to driving the agenda around 'Network Automation and AI,' a key foundational pillar for the next wave of growth in telecoms.

Place: Sofitel Jumeirah Beach, Dubai, UAE



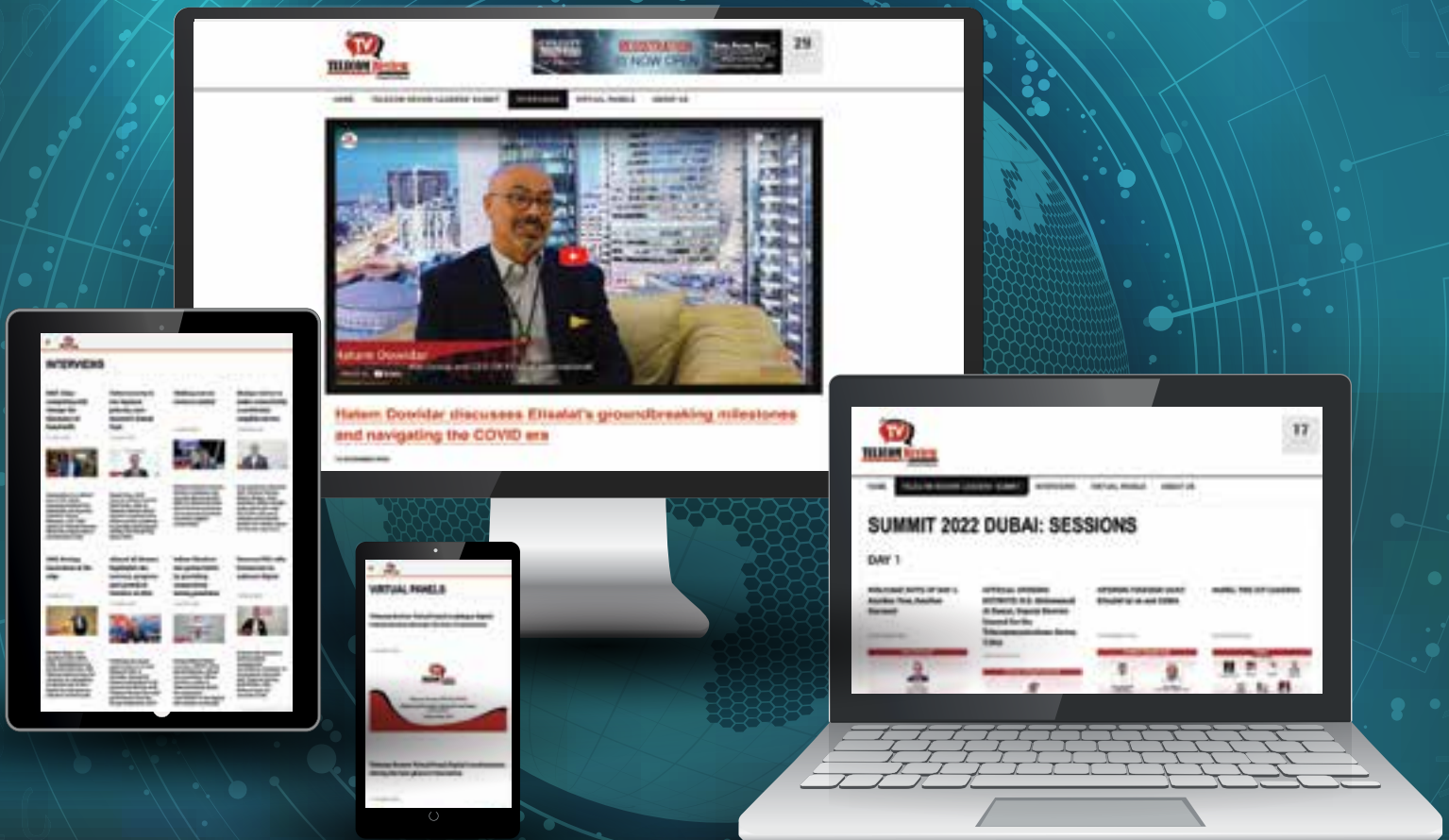
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MARCH

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CABSAT

The event brings together key international decision-makers, buyers and thought leaders, eager to meet face-to-face and learn more about your company's products and solutions.

Place: Dubai World Trade Center, UAE



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MAY

COMEX

Under the slogan Future Tech Redefined, COMEX 2023 is a great opportunity for enterprise-level companies and startups alike to interact and connect with investors and buyers of future technologies.

Place: Oman Convention & Exhibition Centre, Muscat, Oman



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MAY

GITEX GLOBAL

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

Place: Dubai World Trade Center, UAE



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OCTOBER

Telecom Review Leaders' Summit 2023

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



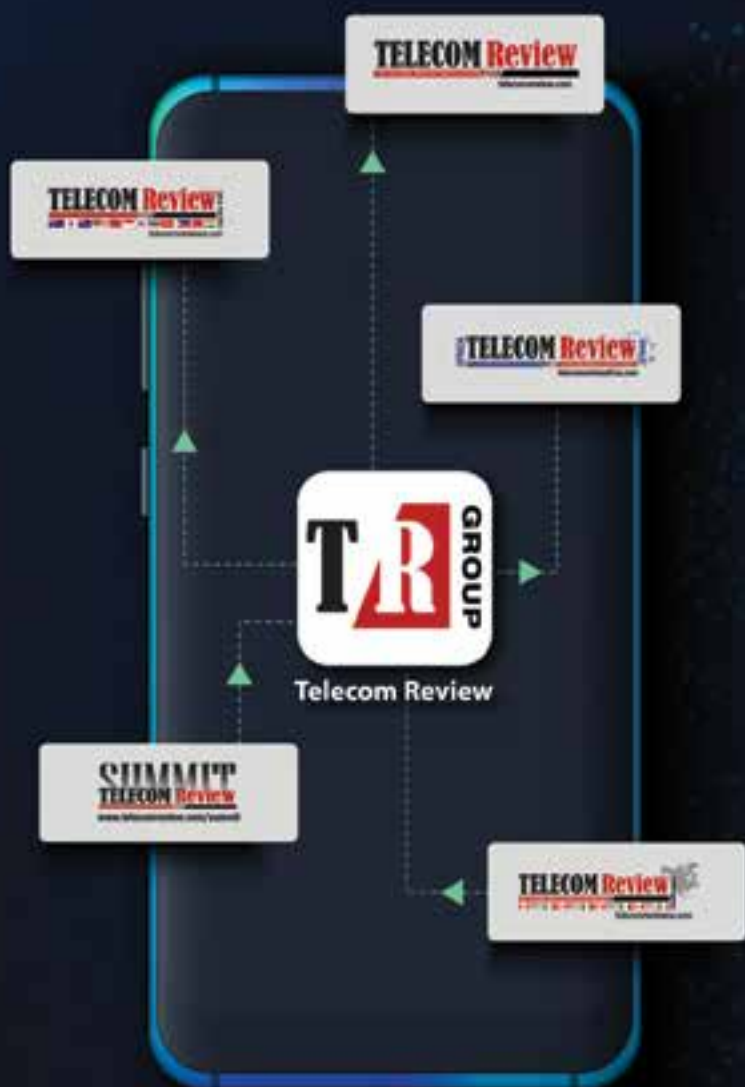
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DECEMBER

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