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Ooredoo Oman: A Connectivity and Digital Leader

Noor Al-Sulaiti,
CEO, Ooredoo Oman

**Technology Advancements
Are Upon Us:** What Will the
World Become

Surface Under Attack:
Addressing Digital Safety

New Access Mode:
Mobile and Cloud



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Toni Eid,
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Cryptocurrency: The Fake Future

The hype around cryptocurrencies has been around now for quite some time and this trend has been excessively promoted on social networks, in the media and in social gatherings and discussions, under one objective: to take your cash and give you in return fake money.

Cryptocurrencies are still not recognized worldwide as an actual currency that you can pay for goods and services which put its credibility under the spotlight.

A cryptocurrency is made by huge capacity servers working 24 hours with very sophisticated software to create this hype online - or what is called mining. But mining here doesn't refer to the underground digging but rather to online traffic looking for buyers who are dreaming of becoming rich quickly, or for people seeking money laundering knowing that central banks cannot trace these types of transactions.

Those billions of transactions are made to manipulate the markets of crypto and manage a virtual stock market where the stocks are only cryptocurrencies.

It is true that this is a stock market, however, it is not regulated by any company, federal bank or central bank to protect users or buyers.

On another note, mining servers consume a lot of energy which adds exorbitant costs. Now with the soaring energy cost, cyptocurrency mining costs much more and is starting to suffer just like any other industry.

Those are the facts and it's up to you to take your stance.



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Noor Al-Sulaiti, CEO, Ooredoo Oman

Ooredoo Oman: A Connectivity and Digital Leader

In an exclusive with Telecom Review, Ooredoo Oman CEO Noor Al-Sulaiti brings a wealth of experience and expertise gained over 17 years of progressive and rotational roles in the telecoms industry.

A

ppointed as Chief Executive Officer of Ooredoo Oman in May 2021, Al-Sulaiti joined Ooredoo in 2004 and was most recently CEO of Starlink, a leading Ooredoo Group retail chain and IT service provider in Qatar. During her time as CEO of Starlink, Noor made a considerable impact on the market by rebranding and expanding the portfolio and capability of the company, enabling it to compete in e-Commerce, retail and ICT. Previously, she was also the General Manager of Phono and Fasttelco in Kuwait.

Al-Sulaiti holds a Bachelor's degree in Computer Science from the University of Qatar and a Master's degree in Business Administration – Strategic Management from the University of Plymouth.

Ooredoo Group, of which Ooredoo Oman is a key operating market, is off to a good start in 2022. Can you bring us up to speed with the Group's footprint and strategic vision for the rest of the year?

Ooredoo Group has been on a digital transformational journey for years now; investing in networks, technology and people so that we can, in turn, deliver transformational digital experiences for our customers, wherever they want them online.

The Group has, at its core, a robust strategy designed to ensure the organization is future-proof and well-

placed to leverage our technology, experience and partnerships, creating an unrivalled customer experience. With so many aspects of people's lives now online – and demand for fast, reliable networks ever increasing – the role of a quality connectivity provider has never been more important, and we shoulder this responsibility with pride.

Ooredoo Group will continue its digital-first strategy into 2022. We will stay focused on being agile and adaptable, and on maintaining a culture of innovation within both our organizations and in our many partnerships with world-leading technology providers.

Ooredoo Oman embodies the vision of Ooredoo Group in all aspects of its operations. As we move into the second half of 2022, we will – in alignment with the Group's strategy – continue to innovate with our products and services; improving our mobile and fixed line services, further expanding our network to provide superior connectivity across the entire Sultanate, and increasing our investment in a 5G-empowered Oman.

We will also continue to support Oman's economic growth as a new era of competition dawns, and remain committed to our customers by offering them a seamless, unrivalled digital experience.

How does Ooredoo Oman work in line with the Group's vision and what is the company's role in Oman's society being an important tech and communications hub in the Middle East?

The Ooredoo Group strategy and vision fuel Ooredoo Oman's drive to deliver a transformational and differentiated digital experience, and give customers, businesses and government access to the best digital connectivity solutions. Our role in society is to give our customers an awesome, digital-first, customer experience, by tailoring our products and services to the specific needs of individuals and businesses in a way that is flexible and unique to them, but in a responsive and agile way.



The demands of customers are always changing and so too is the experience we provide. Customers are at the heart of what drives our innovation and services and we aim to please.

Crucial to the customer experience is addressing customers' needs and expectations so that we can influence and fine-tune the customer journey. It is also important for helping us understand our customers better and create an emotional connection with them, thus ensuring greater satisfaction and loyalty. It is also important to target all segments of the Omani market. Our experience must appeal to everybody, whether a mobile prepaid customer or a large organization, but perhaps our biggest focus is on our largest market – the youth. Oman has a very young, tech-savvy population and through our digital channels, we are able to reach them in a way that is both meaningful and desirable.

Our industry is also a key driver of digital transformation, which aligns



Our role in society is to give our customers an awesome, digital-first, customer experience





with Oman's Vision 2040's aim to be a digitally-advanced economy. We are leveraging the power of communications and global successes across Ooredoo's network to stimulate economic and social development, while positioning ourselves to thrive in the future.

While Oman as a market has unique demands and a 'one-size fits all' approach would not work, as a telecommunications operator, we are connected globally and play a critical role in society by connecting everyone. We must traverse both the global market and the local market by offering the latest technology, remaining competitive and facilitating cross-border communications, while also ensuring that a strong and stable network serves isolated areas of Oman because we understand that people living in these communities rely on connectivity for education, business and trade.

Staying on the forefront when it comes to innovation and collaboration

is therefore important, and the strength of Ooredoo Group is integral to this, by both adopting and adapting successful strategies from elsewhere and moving the industry forward by sharing success stories from Oman.

Some of our success stories have been the rollout of 5G at the height of the pandemic and the continued development of transformative technologies such as cloud services and IoT. In addition, our three state-of-the-art data centers keep businesses and customers connected, safely and securely, helping to power the country's economic growth and providing contingencies in emergency situations or if natural disasters occur. Indeed, we are ultimately supporting Oman to keep pace with global technological and industrial trends, which is integrated into the world's economy.

Moreover, we play a part in nurturing the development of Oman's people and enterprises, through a range of entrepreneurial training and skill-

boosting programmes. We also care for and support the communities in which we operate, by providing both sustainable support and much-needed resources.

How does Ooredoo Oman carry out its position as one of the 5G experience leaders in the market? What would this entail in the long run?

We believe that as a connectivity and digital leader in Oman, we carry a big responsibility towards digital enablement. Our job is to connect the world, and ever since Ooredoo arrived in Oman as the alternative provider, we have thrived on delivering a great experience, standing out from the competition and becoming the provider of choice for the communications and technological needs of our customers.

For Ooredoo Oman, digital leadership is evidenced by a number of things. Our multi-award winning App, with over 1 million downloads to date, stands out over competition and was a pioneering app for the sector. We have also collaborated with National Bank of Oman to launch pay+, Oman's first telecoms driven mobile wallet and even our social media was groundbreaking for telecoms in Oman; with us quickly establishing leadership across many social channels.

We have also been recognized for data analytics in Oman, with our new data center. Opened in 2021, the 7,000 square meter facility represents a major breakthrough for hosting and data processing in Oman, allowing us to further develop our infrastructure, invest in technologies, and support the unique needs of consumer and business customers.

We were thrilled to launch 5G in 2020, starting with our excellent value 5G Home Internet and a few months later, our 5G B2B plans; both of which are available to an ever-expanding number of locations across the country. We followed this with our launch of 5G for mobile and our coverage is expanding fast.

We are also currently working hand-in-hand with our partners and vendors

to allocate a 5G service which will support and uplift the industry to the next level of digital transformation.

Indeed, it has been shown that broadband speed will impact the growth of the economy and will positively contribute to the country's GDP. Doubling the connectivity speed for an economy will result in increasing GDP by 3%.

Working towards this, the next five years will see us constructing and installing a further 2,200 5G stations across the country. And we're not stopping there, as we continue to upgrade, enhance and extend our network reach across Oman.

In the long run, 5G improves connection speed, boosts mobile capacity and data rates. But, it's so much more than that. The technology holds the key to shaping the future of practically every industry. From manufacturing facilities maintained by connected robots to cars that self-drive and even self-diagnose, 5G is set to become the basis for all things connected.

The future of 5G is something we're very excited to be a part of, as it will bring about a truly connected world and massive IoT across almost all industries. It will reshape our digital experience, and although it requires a complete overhaul of infrastructure to deploy it, the benefits will greatly outweigh the challenges of implementation.

The company is also known to be centered on supporting entrepreneurship and SMEs. Can you elaborate further on the initiatives on this matter?

SMEs are a huge focus for Oman and we have an important role in enabling and supporting them to grow their businesses, thereby boosting the economy overall. Ooredoo's support for SMEs includes a number of training and entrepreneurship programmes aimed at championing leadership and innovation. As part of our world-class CSR programme, Ooredoo Goodwill, we help fill the gaps in the job market, and



prepare young start-ups to take on the digital world and contribute to economic growth; in line with His Majesty's Vision 2040 of becoming a technologically-advanced and knowledge-based economy.

As an active member of the Omani society, we are very much in touch with how the country is changing and developing and we are proud to play our part in supporting this development.

Our CSR programmes revolve around current issues and needs, but they are always developed with the long-term impact in mind. Our youth-led initiatives, like FURSA and our Business Opportunity Platform, have been designed to promote entrepreneurship in young people and help them fulfil their ambitions and be a part of Oman's future.

On the other hand, our women's empowerment programmes, such as our incubators and Springboard, have also been developed with the

idea that, for our society to continue to prosper, women need to be capable of fully participating in economic development. This is something that His Majesty Sultan Qaboos bin Said promoted, and that His Majesty Sultan Haitham bin Tarik has reinforced. Since its launch in 2015, Springboard has graduated over 2,000 women and is about to enter its 21st wave.

Sitting alongside Springboard is Spring Forward. Open to both men and women, the course aims to help young Omanis reach their full potential, while addressing the current needs of the market with the long-term impact in mind.

Of course, we also provide a number of solutions for SoHos and SMEs, which are scalable and flexible, allowing them to grow and develop with the company.

Our advancements in ICT capabilities have also allowed us to provide the safest and most up-to-date cloud storage solutions, through our



subsidiary, data2cloud. Our award-winning state-of-the-art data centre, which represents a major breakthrough in hosting and data processing within the country, means that we are ahead of the game for business solutions, contingency and hosting. In fact, it is the only Tier 4 data centre in Oman, guaranteeing around 99.98%+ uptime, according to an internationally-recognized framework.

In your perspective, what is the key to the success and competitiveness of telcos in the fast-paced digital economy? How is Ooredoo Oman manifesting this into reality?

Success in a fast-paced and constantly changing sector is ultimately driven by innovation and technology. Our appetite to be able to do everything online and instantly is continually increasing, and we are more aware of the possibilities of technology and that sets up the expectations we have for it. We want to be able to do more, and now! Maintaining leadership and competitiveness in this industry relies on innovation and technology to drive

the digital experience forward. And we have to keep in mind that competition is definitely heating up, with the recent launch of the third mobile operator. We've got to be on the forefront when it comes to maintaining market share and retaining customers, so the pressure is on.

Telcos connect the world and we have a remarkable role in society to connect everyone. It's more evident in a country like Oman, where we have remote communities that need connectivity to enable education, business, commerce, and even entertainment. We are at the cutting edge of this market and the ongoing digital transformation has the power to inspire and drive the changes we can envision, as well as those we haven't imagined yet. So much progress has been made in the last five years and it is difficult to predict where the industry will be in the next five years, but our goal is to make sure we are in tune with what customers, businesses and the economy need and want and to be ready to deliver it. The way an operator – indeed, a society

– harnesses new, successful ways of operating determine the speed at which an economy grows, and with Oman's Vision 2040 objectives in mind, it is vital that we continue to make progress towards these goals.

The sector must continue to embrace the goal of a becoming a fully digital society, and a key component of this is digitalizing retail and government services. We must move and adapt quickly to not just follow, but lead the way.

Within this remit sits the growth of web 2.0 applications and social media platforms, which have evolved and converged with web 3.0 through the growth of AI, IoT, and virtual reality, augmented reality, fintech and blockchain. In fact, blockchain validation has become the next way for telcos to participate in web 3.0. The telco industry can use their data centres to ensure blockchain validation is not amassed by central authorities – the very thing that web 3.0 is designed to remove. So perhaps becoming a validation 'hub' is a way for telcos to have a greater future role as web 3.0 becomes more prevalent.

Lastly, we must not forget technology leadership; the most recent evidence of which is our investment in a state-of-the-art carrier neutral data centre in Salalah, to host the 2Africa Submarine Cable System. This is one of the largest subsea projects in the world, connecting 23 countries in Africa, the Middle East and Europe. The data centre will provide co-location and cross-connection facilities with global connectivity. It will also elevate Oman's global standing in providing best-in-class hosting and co-location services to hyperscalers and other content providers, to establish a regional node for traffic flow between the West and East – to Africa and the Gulf.

How does the company approach customer experience and what makes the Ooredoo experience unique?

The customer experience is central to maintaining competitiveness. Every touchpoint must be considered and made available for customers to obtain products and services, raise queries,

obtain information and come along on a journey with us; from their very first interaction. We want to provide them with a unique experience that exceeds their expectations and turns our customers into brand ambassadors.

How do we do this? Through a seamless omni-channel experience that includes not only face-to-face store interactions. Our multi-award winning App, with over 1 million downloads, can do just about anything and everything. Our social media channels, the contact centre and our online AI chatbots are there to solve issues, allow customers to change and amend their service, apply for new products, send data to other users, and even enjoy winning prizes and redeeming rewards.

The customer experience is now completely intertwined with the use of technology and has improved access to everything we offer. This trend is equally prominent across the ICT landscape, whether it is in financial services, healthcare, retail, social media, and entertainment, and effectively implementing and leading the way with innovation and translating that into a great customer experience will see telcos thrive, both now and in an increasingly-digital future.

Being sustainable is one of the highlights among telcos. What ESG initiatives do Ooredoo Oman have to remain socially responsible for stakeholders and customers?

Group-wide, Ooredoo is committed to the highest standards of environmental protection. Throughout the network, we work to reduce our ecological impact by sourcing sustainable materials and products, reducing emissions through the use of energy efficient technology, and supporting customers to reduce their impact on the environment by enhancing and encouraging the use of digital products.

In 2015, Ooredoo pledged its commitment to the United Nations Sustainable Development Goals (SDGs), and every innovation we have made since – and will make in the years to come – is in line with this promise to deliver a sustainable legacy.

We have made a firm commitment to leverage our expertise across the company's international footprint to bring about positive social and economic change. The cornerstone of this pledge is the Ooredoo Goodwill Journey, which has travelled the country every year since 2005 to support under-served communities, families in need, the youth, the elderly, people with disabilities and female-driven businesses. These contributions and donations have helped thousands of people to reach their potential and have made a real difference in the communities we serve. In total, in both 2020 and 2021, we recorded 900 volunteer hours each year in support of community initiatives. Given the prevailing circumstances, this is an achievement we are very proud of.

Throughout the network, Ooredoo is overseen by the most stringent governance which ensures that all decisions are taken with the company's vision in mind. Ooredoo has developed Guidelines for Ethical Conduct and Fair Practices which reaffirms the company's zero-tolerance policy for any form of bribery and corruption. All actions and decisions are independently audited and reported to maintain the utmost transparency to build bonds between stakeholders and customers.

An Environmental, Social and Governance Review is also published annually, detailing the progress towards agreed targets and reinforcing Ooredoo's commitment to the United Nations SDGs across all Ooredoo operators.

Ooredoo Oman's support for the community in 2021 during the COVID-19 pandemic and Cyclone Shaheen are prime examples of how the company has stepped up to support nationwide relief efforts and proven its ability to respond to crises quickly and effectively. Indeed, when cyclone Shaheen hit, the company ensured sustainable operations and managed to keep its network up and running, as well as provided support to impacted people in different areas. This kind of response and resilience very much align with the UN Sustainable

Development Goal of promoting good health and well-being.

The external audit also confirmed that implementation of 5G Intelligent Scheduling for Power Saving (NR) resulted in an increase in energy efficiency of 5.5%. The Intelligent Scheduling allowed the base station to adjust to power demands and increase or decrease energy consumption rather than running at full power unnecessarily.

We are determined to make a positive difference to our customers in Oman and play an important role in national sustainability efforts by reducing emissions, conserving energy and providing extra value to customers and the country at every turn. Being able to operate sustainably and ethically remains a long-term priority for Ooredoo in every market and an area of constant innovation. 



In 2015, Ooredoo pledged its commitment to the UN SDGs and every innovation we have made since and will make in the years to come is in line with this promise



UAE's 19,000 Radiocommunication Stations Registered at ITU



The Telecommunications and Digital Regulatory Authority (TDRA) announced that the UAE has successfully registered more than 19,000 terrestrial radiocommunication stations at International Telecommunication Union (ITU), which is the UN's specialized agency for information and communication technologies (ICTs). This achievement represents an international recognition of the frequencies allocated to

the UAE and the ability to protect radiocommunication stations from harmful international interference, which greatly affects the quality of services provided to the public.

Commenting on this accomplishment, Eng. Tariq Al Awadhi, Executive Director of Spectrum Affairs at TDRA, said, "The spectrum is a natural resource, and the UAE is keen to use it adequately to ensure providing optimal communication and broadcasting services. To this end, TDRA has been developing plans and strategies to manage spectrum resource and accelerate the deployment of radiocommunication stations, in cooperation with service providers. Furthermore, TDRA held regular

meetings and signed agreements with the competent authorities in sister and neighboring countries to limit harmful interference that may occur on radiocommunication services. These efforts by TDRA reflect its key role in protecting terrestrial and space radiocommunication stations from harmful interference that may be caused by other countries."

TDRA pointed out that it is continuously upgrading the frequency spectrum management system with the aim to reach the latest version used in spectrum management at the regional and global levels and to provide the users in the UAE safe frequencies that are free from harmful interference.

New Saudi ICT Law Created to Accelerate Digital Economy



According to the Ministry of Communications and Information Technology (MCIT), the new Saudi ICT law has been approved by the Cabinet.

Targeting to consolidate the Kingdom's position as a regional center for

technology and innovation and achieve global leadership, the new Saudi ICT law will help accelerate the growth of the digital economy and qualitative markets such as digital content and emerging technologies, worth SAR 11 billion, and cloud computing, worth SAR 10 billion.

Furthermore, the newly introduced law will help increase the flexibility of digital infrastructure as a backbone of digital transformation; improve the demand, experience, and quality of national services and products; and provide an

attractive environment for IT investment.

The new Saudi ICT law will also create 318,000 jobs and boost technology adoption for a digital society with an innovative future as it promotes clarity and transparency of procedures as well as frequency spectrum regulations.

The economic impact represented in expanding the ICT market, which size is estimated at SR144 billion — the largest in the Middle East and North Africa (MENA) region — is well considered for the new Saudi ICT law.

Lebanon Imposes New, Higher Telecommunications Tariffs



In light of the dire economic situation in Lebanon, Lebanese Minister of Telecommunications Johnny Corm held a press conference, along with Ogero, Alfa and touch, to inform subscribers of an increase in telecom prices that sooner or later had to happen to protect

the sector from falling apart. The new prices will all be in USD at the exchange rate of BDL's Sayrafa platform.

Salem Itani, CEO and Chairman of touch explained how the devaluation of the Lebanese Pound has pushed telecom operators to increase tariffs to be able to continue in providing telecoms services to the subscribers.

Alfa CEO and Chairman, Jad Nassif highlighted as well the need to revise prices while taking into account subscribers with low incomes. He

emphasized that this step was taken to guarantee the telecommunications sector's continuity.

Ogero Chairman Imad Kreidieh stressed that the increase does not fully cover Ogero's operational expenses given the currency's devaluation and lack of resources, however it was calculated based on the people's purchasing power.

Kreidieh noted that the increase is by two and a half times but new packages will be offered to subscribers and SMEs.



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- Log retention



Cybersecurity of 5G Networks:

EU Publishes Report on the Security of Open RAN

The EU Member States, with the support of the European Commission and ENISA, the EU Agency for Cybersecurity, recently published a report on the cybersecurity of Open RAN. This new type of 5G network architecture explores alternative ways of deploying the radio access part of 5G networks based on open interfaces.

Following up on the coordinated work already done at EU level to strengthen the security of 5G networks with the EU Toolbox on 5G Cybersecurity, Member States have analysed the security implications of Open RAN.

The report found that Open RAN could bring potential security opportunities, provided certain conditions are met. However, the Open RAN concept still lacks maturity and cybersecurity remains a significant challenge. Especially in the short term, by increasing the complexity of networks, Open RAN would exacerbate a number of security risks. Those risks include a larger attack surface and more entry points for malicious actors, an increased risk of misconfiguration of networks and potential impacts on other network functions due to resource sharing. The report also

notes that technical specifications, such as those developed by the O-RAN Alliance, are not sufficiently mature and secure by design. Open RAN could lead to new or increased critical dependencies, for example in the area of components and cloud.

Margrethe Vestager, Executive Vice-President for A Europe Fit for the Digital Age, said, "Our common priority and responsibility is to ensure the timely deployment of 5G networks in Europe, while ensuring they are secure. Open RAN architectures create new opportunities in the marketplace, but this report shows they also raise important security challenges, especially in the short term. It will be important for all participants to dedicate sufficient time and attention to mitigate such challenges, so that the promises of Open RAN can be realised."

Thierry Breton, Commissioner for the Internal Market, added, "With

5G network rollout across the EU, and our economies' growing reliance on digital infrastructures, it is more important than ever to ensure a high level of security of our communication networks (...) This report shows that there are a number of opportunities with Open RAN but also significant security challenges that remain unaddressed and cannot be underestimated. Under no circumstances should the potential deployment in Europe's 5G networks of Open RAN lead to new vulnerabilities."

Overall, the report recommends a cautious approach to moving towards this new architecture. Any transition from and coexistence with existing, reliable technologies should be done by allowing sufficient time and resources to assess risks in advance, implement appropriate mitigations and clearly define responsibilities in case of failure or incident. **TR**

June 23rd,
11am, Dubai time



IPv6 ENHANCED: INSPIRING INNOVATION, BOOSTING MIDDLE EAST DIGITALIZATION

For the third consecutive year, and following the success of the first two editions, Telecom Review is organizing the IPv6 Enhanced online summit entitled **IPv6 Enhanced: Inspiring Innovation, Boosting Middle East Digitalization**.

The online summit will provide an update on the IPv6 Enhanced scene in the Middle East and the role this innovative technology is playing in boosting digital transformation in the region.

International high level speakers will present their perspectives on the topic and share insightful details on their IPv6 Enhanced plans and strategies.

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For more information, contact Christine Ziadeh: christine@tracemedia.info



Stefano Resi, Sales Director, Nokia MEA

NOKIA

In an exclusive interview with Telecom Review, Stefano Resi, Sales Director, Nokia MEA shared insightful notes on the influence that webscalers have on the telecommunications scene and cited some of Nokia's webscale networking solutions.

A

s a webscale expert, what's your view on the impact of the growth of webscalers' presence on enterprises in the MEA region in the near future?

All over the world, webscalers' content has entered into the fabric of the society fuelling a sustainable change. They have been the engine of the development of new services, which in turn have supported enterprises to accelerate their efficiency and competitiveness. We have all experienced how these services have helped us, as consumers, employees, entrepreneurs, and citizens during the Covid-19 pandemic.

The MEA region is currently witnessing an unprecedented increase in optical subsea connectivity, which is expected to drive new investments (local and foreign) to develop innovative cloud infrastructures and services in the region, many of which will be tailored to the region, pulling in local IT enterprises.

How are customers - regionally and globally - utilizing Nokia's webscale networking solutions?

For a few years now, Nokia has been collaborating with the most prominent hyperscalers in the world and design solutions that are, from blue-print level, tailored for their needs. We announced multiple partnerships with leading public cloud providers such as Google Cloud, Microsoft, and Amazon. This has been

“New Relationship between OTT and Telcos Has Potential to Trigger Positive Changes in MEA Economies”

leading to the development of solutions and use cases to solve key networking scenarios for businesses worldwide. This collaboration is now naturally evolving into partnership to pursue their successes in the different networking domains.

A key example is Nokia's innovative Data Center Fabric solution, designed specifically for data centers operational environments and based on SR Linux. It's our new, totally open, extensible, and resilient network operating system (NOS). It provides an open and scalable telemetry framework and a unique NetOps Development Kit (NDK) that enables both native and third-party applications to run seamlessly with full and equal access to underlying system resources. Nokia's SR-Linux is in effect the industry's first fully open and flexible networking application development environment.

The second major area of cooperation is in the domain of the IP-Routing (internet and DC gateways, peering, edge routing, etc.) where Nokia just released its fifth generation in-house silicon (FP5). These products have quickly become renowned in the industry for their Silicon-embedded security, programmability and energy efficiency. Most importantly, all the above features do not compromise on throughput!

Thirdly, local and international web-scalers utilize Nokia's complete optical catalogue to interconnect data centers as they appreciate their unparalleled security, scalability, quality, and capacity.

Fourth, Nokia is one of the few companies in the world that can successfully deploy submarine cables.

Further, all the above is complemented with a rich set of automation software that allows a simple and powerful control over the entire network, inside and outside the data center.

Aside from the technical solutions, the real key for Nokia's successes in this region is the wider presence in a vast majority of MEA countries, which provides our customers the confidence

that we are the right partner to support their projects in any country.

What is the relationship and growth outlook between telcos and web-scalers in terms of delivering reliable connectivity and diverse content?

This is a very interesting question. I'm old enough to remember the times, not so long ago actually, where web-scalers were called "OTT" (Over-The-Top players). Many telcos perceived "OTT" players as entities that were capable of highly monetizing their networks without putting any investment, or effort in their build. At that time web-scalers were very much focused on developing "content" (and powerful datacenters) that didn't fully appreciate the importance of networks to connect their services efficiently to millions of users. Relationship was generally not at its best.

A fruitful dialog, in my view, started when two main technology shifts kicked-in:

- 1- 4G and 5G technologies required telco operators to partner with web-scalers in order to build modern clouds for their telco usage.
- 2- The contents provided by Hyperscalers became highly dependent on network design KPIs such as latency, convergence, capacity (i.e. video streaming apps, webinars, gaming, self-driving vehicles etc).

As often happens in human relations, what started as a difficult relationship is now turning into a fruitful partnership. And this partnership has all the potentials to trigger a long-lasting positive change affecting all sectors of economy.

How can new connectivity and content methods like webscale networking transform the emerging digital economies within the MEA region?

The new, massive, affordable connectivity and cloud-content arriving in MEA will boost education, competence, and access to worldwide information, particularly in the younger and creative minds. The opening of a major research center by Google in Kenya is one important piece of this picture.

New competences will produce a generation of entrepreneurs from MEA, competing on par with their peers in other parts of the world in producing games, automation, e-commerce, operations and business software, etc. Entrepreneurs will propel a transition into "digital economies" when many of these innovations will find their way into the industry, finance, agriculture and mining, and this is how it will pervade the entire economic fabric of the MEA countries.

The first enabler and cornerstone of this path will be the arrival of massive new subsea connectivity (Equiano cable, 2-Africa, etc.) in the next three years. It will drive new investments in modernizing all networking domains, and from here create an "avalanche effect".

What strategies could be expected from major telcos and web-scalers to adapt to digital demands in society?

In my view, the first and foremost strategic direction is to create solid partnerships between local telcos and international web-scalers. Telcos have a very good knowledge of their end customers' needs and desires. They also possess the very infrastructure that allows web-scalers to reach users, hence the perceived quality of their content depends on it. Web-scalers provide the services and content that are currently the prime reason why customers would be ready to pay a premium for a better connectivity.

Zooming into the networking aspects, MEA players will have to implement strategies in the following three directions:

- 1- Assure coverage (fixed and mobile) as a large part of the MEA population still does not have adequate access to services, with a focus on quality in key areas.
- 2- Increase international connectivity, ensuring its redundancy, by creating "highways" toward the subsea landing points.
- 3- Invest in modern DC infrastructures to allow local economies to develop and consume locally cloud services.

Governments are also playing a key role in this transition by implementing modern legal frameworks, assuring the necessary security blanket to their users. **TR**



Markus Golder, CEO, Intigral

Intigral Navigating Digital Entertainment in MENA

Intigral has proven to be one of the key media and entertainment players in KSA and the MENA region, notably through its platforms Jawwy TV (also known as stc tv in Saudi Arabia, Kuwait and Bahrain). Telecom Review interviewed Intigral CEO Markus Golder to find out more about the company and the role that Jawwy TV is currently playing in the region.

Can you tell us more about Intigral's work and how is it navigating digital entertainment in MENA region?

Intigral is the media and entertainment arm of stc, based in the Kingdom of Saudi Arabia, currently operating in eight markets across the MENA region. Our success in those markets is due to our strategic approach in offering premium over-the-top media services such as Jawwy TV that provides a curated and vast lineup of live TV channels, and video-on-demand titles.

Our journey began in KSA, Bahrain and Kuwait, however, over the past couple of years we have seen an exponential growth and ultimately expanded into other markets. Our focus is on improving brand awareness throughout MENA, and partnering with world-leading content providers. As a matter of fact, a recently conducted survey highlighted the positive impact of driving brand awareness in the MENA region, showing a high brand satisfaction rate of 78%. Our users have reported that content quality, ease of use and great value for money are among the top reasons they choose Jawwy TV.

Jawwy TV is one of the products you offer. How is it building its competitiveness in a video OTT market with an increasing number of global and regional players?

As a rising OTT brand, Jawwy TV has differentiated its offering by providing a single, easy-to-use interface that allows viewers to access their favorite live channels, and movies and series in an all in one easy to access interface at any time. To give you some insight into how it works: Jawwy TV is a virtual multichannel video programming distributor that gathers content from multiple sources and offers subscribers a broad range of content on one platform by combining live TV as well as video on demand and making them available in both Arabic and English. We have more than 200 live TV channels, some of them free to air, some of them encrypted, as well as an immense library of more than 28,000 Arabic and Western titles, curated through partnerships with more than 30 content providers such as MBC, OSN, Fox, Wide Khaliji, Starz Play, Discovery and Shahid VIP.

We also support the widest range of devices that basically allows customers to access our TV service from wherever they are over any device, be it a set-top-box, a Web browser, the

smartphone, or a tablet. We have also included a download-to-view facility that enables viewers to download a series or a movie to watch during a flight as an example, or even via smart TV apps and gaming consoles.

Relative to our pricing, Jawwy TV is being structured as a tiered portfolio service ranging from subscriptions as low as 15 Riyal to 60 Riyal per month (in Saudi Arabia, with varying prices in other markets). The tiers vary in terms of the number of concurrent streams, devices, video quality and other playout features, such as live TV features including live start over, and up to 14 days of rewind to enhance the consumers' experience.

Ultimately, our strategy revolves around the subscribers as well as the entertainment community. In 2021, we ranked as the 3rd highest OTT provider that invested in Arabic content, contributing to 22% of the total Arabic Original output. Our focus is on the aggregation of high-quality content while facilitating knowledge transfer in the region with the objective of enriching the local digital entertainment sector and supporting the ambitious goals for the media industry as outlined by Saudi Vision 2030.

How are you keeping abreast with the consumer demands in a fast-changing OTT market?

The rapid advancement of high-speed connectivity and digital infrastructure has propelled video OTT services, making them the preferred choice for consumers to watch live TV and video on demand. We have invested significantly in content delivery technologies to ensure that their experience with the platform is seamless, immersive and personalized.

Such technologies enable customers' access to premium quality viewing options through Jawwy TV's cloud-based solutions that deliver Ultra-HD and 4K content. On the users' side, subscribers can create multiple profiles to cater to each family member enabling us to provide customized recommendations and parental controls accordingly.

Understanding the shifts in usage and consumer preferences is really key here. Compared to satellite TV providers, we have access to a wealth of data and insights about our customer's consumption and viewership patterns, allowing us to strategically adapt our services quickly and efficiently to meet and exceed our subscribers' expectations and needs.

What are your areas of focus when it comes to investment in content in the future?

Content represents the largest chunk of expenses in our business, and we continue to enhance the content lineup to boost users' engagement. We're doing so through intensifying the collaboration with our existing content partners and forging new partnerships with players currently entering the MENA region.

In addition to our best practices of aggregating high-quality content, we will also continue to secure exclusive titles relevant to MENA's culture, which subsequently serves a dual purpose in contributing to the development of the Saudi digital entertainment sector. Since mid-2019, Intigral has produced and broadcasted a number of original shows for Jawwy TV. We are proud to be building a home-grown digital entertainment ecosystem that fosters

the empowerment of local talents and brings viewers quality entertainment choices.

Where do you see the future of OTTs heading? Will we see a shift from subscription-based to ad-based services?

We anticipate continued growth and transformation relative to how viewers are consuming OTT content in the market. In fact, in 2020, the global market was valued at around US\$101 billion dollars and is projected to reach over US\$223 billion by 2026. The MENA region is expected to grow at an even faster pace compared to the rest of the world.

The reality is that more media outlets are launching their own OTT propositions, and consumers are subscribing to an increasing number of services in parallel. Reports from the US show an upward trend in the average number of video OTT subscriptions per household over the last couple of years, which will continue to grow in the coming years. These subscriptions to numerous services are obviously adding up as an expense and introducing complexity. That's where Jawwy TV comes in, to facilitate by bringing them all together in a one-stop-shop allowing customers to have one subscription and gain access to all their favorite content through our service through an attractive and easy-to-use interface.

At the same time, the advertising market is shifting more towards digital outlets. So, while the traditional advertising expenditure in the MENA region has dropped from about US\$4 billion dollars in 2019 to just slightly over US\$3 billion dollars in 2020, the online advertising market continued to show growth by 2% in the same period to \$1.3 billion dollars.

While today Jawwy TV is a paid subscription-based service only, we are however considering tapping advertising in the future through specific service tiers.

What changes in viewership behavior have you witnessed during Ramadan this year?

This Ramadan, we have seen an exceptional performance on Jawwy

TV, with the number of active viewers increasing compared to last year, along with total viewership hours. A particular customer trend was that live TV consumption was peaking around Iftar time between 6 pm and 8 pm, while video-on-demand has peaked between midnight and Sohur time.

We are confident that viewership numbers have spiked during this period compared to last year due to the overall proposition becoming more comprehensive, through the inclusion of the additional content we have added and intensifying our promotion of the platform.

What's in it for telecom operators in MENA working with Intigral and including Jawwy TV in their value propositions?

For telecom operators, expanding into adjacent markets such as video services is essential for monetizing their networks and building differentiation vis-a-vis their competitors, which allows them to increase their ARPU and to reduce churn. Moreover, telecom operators are often faced with having to work with multiple video OTT operators. Jawwy TV streamlines this process, allowing them to work with a single partner while providing customers access to all the content that they are looking for all in one place.

Going forward, partnerships between OTT platforms like ourselves and telecom operators will offer a win-win situation. Telecom operators bring a large customer base of connected users through a trusted brand, whilst OTT providers bring a wealth of expertise in providing exceptional digital content directly to users' devices for a world-class viewing experience. We also provide tailored delivery options, features and recommendation engines for the networks enabling the adoption of flexible and adaptable business models that improve sustainability and resilience for both OTT providers and carriers.

The future of content streaming remains in co-jointly working with telecom operators to offer the broadest range of content that meet the requirements of their ever changing customer segments. 



The Benefits of Agility for a Successful Digital Transformation

Digital transformation is not the mere deployment of new tools but implies shuffling the company's strategy and processes to innovate, satisfy customers, and attract and retain talent to continue generating value.

The Digital Enterprise is based on strong principles: anticipate and prepare for the future while driving the present, think as a customer, think disruptively, focus on value creation more than on preserving existing assets, retain talents and protect them from the temptation of complexity. In most companies, the existing organization, processes and governance structures are not yet adapted to achieve the ambitions of the Digital Enterprise. Successful digital transformation requires a rethinking of the business model.

However, transforming one's operational model cannot be done immediately. It is necessary to carry out the transformation in a smooth and controlled way. Agility is a way to achieve this. It can even become the operational model that best meets the challenges of digital transformation because it brings the company a balance between the satisfaction of customers, employees and shareholders. Decisions are made taking into account the balance between these three dimensions.

But agility is not an option, it cannot be imposed but rather requires real conviction and must be used as a differentiating factor. To succeed, the whole company must invest in this effort of improvement and change. As a subsidiary of the Orange Group, Sofrecom advises, guides and supports the development and the

digital transformation of the main telecommunications players (operators, governments and international institutions). We advise them in their strategic technology and development decisions.

We analyze trends with a focus on different business sectors such as broadband, data/AI, mobile financial services, digital innovation, e-government or IT and cloud hosting strategies.

Agility is one of the levers for successful digital transformation. We suggest you discover its main benefits and the best practices to implement.

To do so, visit www.sofrecom.com 

By Guillaume Boudin, CEO, Sofrecom



Agility is not an option, it cannot be imposed but rather requires real conviction and must be used as a differentiating factor



Successful digital transformation means rethinking the company's culture, services and organization, as well as its information system with a view to continuously improve the service of the company's growth.

Success requires dynamic planning and execution of the strategy with shorter, faster cycles, closer to the actors on the ground and an "agile" structure and processes, capable of adapting to changes as they occur.

Agility is a means to successful digital transformation because an agile company:

- **Is strongly customer-focused:** teams are in direct contact with their customers and have full latitude to decide what is good for overall performance.
- **Encourages experimentation:** the agile company has in its genes the analysis of alternative paths to develop a solution and maximize overall performance.
- **Accepts failure:** failure is accepted as a natural consequence of experimentation.

- **Encourages innovation:** managers encourage individual initiative by giving employees time to develop their own projects and innovate.
- **Develops and respects its employees:** the agile enterprise relies on managers who develop their teams by unleashing the talents of each individual. It places its employees at the center of its value creation.
- **Bases its decisions on the value created for the organization:** the agile enterprise pilots all its operational decisions by value and analyzes their long-term consequences.

Agility is therefore a culture of adaptation to permanent change and this culture must be a perpetual dynamic as soon as we evolve in a context of uncertainty. An agile transformation is above all a question of human skills. It is not in itself a competitive advantage, but the indispensable foundation of the culture of change that must permeate the entire company. It must guide the strategy without conditioning it and, above all, serve the human being at the heart of the transformation dynamic.

A successful digital transformation implies to be an agile enterprise.

By Claire Khoury, Marketing, Communication & CSR Director, Sofrecom





Luciana Camargos, Head of Spectrum, GSMA

GSMA's Luciana Camargos Calls for 2 GHz of Mid-band Spectrum

Spectrum assignment is an important element to ensure the Middle East and North Africa's economic prosperity. An expert on this topic, Luciana Camargos, Head of Spectrum at the GSMA, discussed in an exclusive interview with Telecom Review, how Spectrum is a key driver of economic growth in MENA, and explained more about the importance of GSMA's recommendation of the 2 GHz of mid-band spectrum.

According to the GSMA, if its recommendation of 2 GHz of mid-band spectrum per market is not met, up to 40% of economic impact could be lost. In the interview, Luciana explains more about 5G's contribution to the GDP and how studies have reflected the significant importance for countries to plan ahead and have the 2 GHz band at the heart of their policies.

How is Spectrum assignment a key driver of industrial development and economic growth in the Middle East in particular?

In 2018, we launched the study on the social-economic benefits of the mmWave and the new use cases that will be brought about by 5G. However, we had never done an overall study of the social and economic benefits of spectrum. Therefore, we launched a study in February this year that looks into the social-economic benefits of 5G in general, with a focus on the low band, mid band, and high band.

The study showed that the socio-economic benefits of 5G will reach \$960 billion in 2030 globally. We also found out that approximately 63% of that value comes from mid-band spectrum. Thus, the mid-band is the backbone of 5G, where most use cases and networks run.

When it comes to the regional overview, MENA's contribution was \$16 billion in the terms of GDP, which is equivalent to 0.35% of the GDP. When we look at all the regions, the GDPs is a little bit similar and goes from 0.3 to 0.5% and that would be the contribution of 5G in the global GDP.

In what ways can 5G become a central pillar of the Middle East and Africa's economic development strategies?

Network readiness is a key element. Having that \$16 billion in GDP contribution in 2030 will only be realised if enough spectrum is made available. In this framework, we

launched a study last year which showed that 2 GHz of spectrum is needed by 2030 and if that is not made available to the operators, then they will not be able to build the network which is the pillar of social-economic development.

Tell us more about the GSMA's recommendation of 2 GHz of mid-band spectrum per market. Why is it important?

Industry experts and organizations often discuss what 5G will look like and what services will it deliver. But then a question arises: how much spectrum is needed to do any of that? This part of 5G has not been analyzed and examined before. That's why we wanted to study how much spectrum we need in mid-bands and we are currently studying it for low bands and high bands as well. Interestingly, the results showed that the average spectrum needs in mid-band was 2 GHz regardless if the country was low in income or high income. And the reason for that is because it's based on the population density; and sometimes low-income countries have a higher population density than a high-income country.

So, the average came close to 2 GHz in the MENA region as it did worldwide. Without the 2 GHz, we can't get the full benefits and the full potential of 5G.

What are the spectrum-related challenges in the MENA region and how is the GSMA working on addressing them?

The challenge is getting to the 2 GHz, knowing that not a single country in the world has gotten there yet. The 2GHz target is set for 2030, but we ask countries to look into that path and the challenges and to plan on how they can get the 2GHz in 2030. Some are close to 2GHz and some currently are far from it. It's just very important to plan ahead.

In this context, we launched a roadmap for the MENA region during the Expo 2020 that highlights how to put a plan in place for 10 years, and this will take us to 2030 and to getting the 2GHz.

One of the main challenges that we see is harmonization, so different countries will have different challenges to overcome in terms of current spectrum uses and different demands in many countries. Looking into the specifics of each country while taking into account the regional and global harmonization is the biggest challenge that all the regions will have to face and definitely a challenge for the MENA region. **IT**



The 2 GHz of spectrum is needed by 2030 and if that is not made available to the operators, then they will not be able to build the network which is the pillar of social-economic development





Aqaba Digital Hub Moves Forward Progressively

A new corridor between Asia, the Middle East, and Europe, the Aqaba Digital Hub has made significant progress in addressing the growing demand for the modern digital transformation of businesses, carriers, and technology providers at the regional and international levels.

The construction of the newly expanded project has already started, which includes the new carrier-neutral 5MW data center that will host the forthcoming submarine cable system connecting

Europe and Asia. The new mega data center will commission in 2023 and will be ready for service to connect any customer with a full range of data center services that include secure hosting, international colocation, disaster recovery, and infrastructure-as-a-service (IaaS) at the highest international standards.

This landmark project utilized Aqaba's exquisite landscape to provide sufficient services through a fully equipped business center, hyper-scale Tier-3 certified data center, neutral internet exchange point, state-of-the-art fiber-optic internet network, teleport station for VSAT services, and world-class cloud platform, among others to

serve the growing demand and enlist Aqaba Digital Hub to drive the digital transformation of businesses to the region.

Previously, Aqaba Digital Hub has made considerable milestones in enabling accessibility and connectivity. It has successfully hosted the first IP point of presence (POP) in Aqaba for two international telecom operators along with building and operating Aqaba's first tier-3 Uptime-certified carrier-neutral data center.

Situated by the Red Sea, Aqaba is bound to be the place of Jordan's premier ecosystem that can put forth crucial services to match any organization or institution's digital requirements. Serving as MENA's digital transformation hub, Aqaba Digital Hub is eco-friendly, network-dense, supplies direct connections from a single location, and operates at the lowest latency values.

AqabaIX: 13 Networks, Over 100 Gbps Traffic in First Year

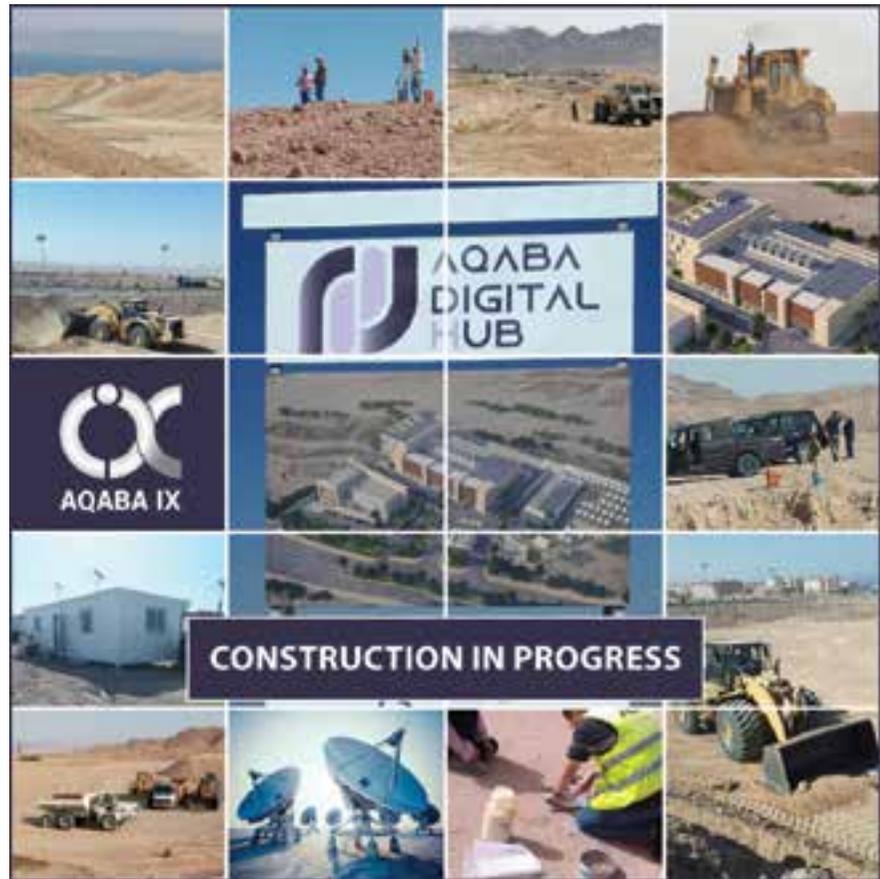
AqabaIX, the first and only internet exchange (IX) in Jordan, with open access and neutral policies, has successfully connected 13 networks in its first year of operation — including a number of internet service providers (ISPs) and content delivery networks (CDNs) such as Google, Packet Clearing House, and Subspace — and achieved over 100 Gbps of peak traffic.

Moreover, Aqaba Digital Hub will soon implement a strategic partnership with one of the major international carrier and data center neutral internet exchange point networks.

While, as part of the collaboration described hereunder with Console Connect, AqabaIX will offer internet exchange services on its partner's MeetingPlace platform, enabling Console Connect users to peer at AqabaIX remotely.

Extended Cloud Services

The Middle East region is seeing the benefits of moving to an automated network environment, and Aqaba Digital Hub's strategic location, coupled with Console Connect's internet on-demand service, will likely enhance internet



access by being delivered via one of the world's largest and fastest IP networks.

Aqaba Digital Hub has already enabled on-demand global connectivity access in the Middle East via the Console Connect network-as-a-service (NaaS) digital platform. Reportedly, Aqaba Digital Hub's customers can seamlessly extend their global reach to more than 50 countries worldwide and directly access the world's major cloud platforms, including AWS, Google Cloud, IBM Cloud, Microsoft Azure, and more.

FTTH: Full Coverage in Aqaba

Aqaba Digital Hub operates the first fiber-optic network in Aqaba, providing state-of-the-art retail and wholesale fiber services addressed to local telecom operators, internet services providers, and international companies with reliable, resilient, and uninterrupted connection and unlimited usage.

Aqaba Digital Hub's fiber-to-the-home (FTTH) network has adequately covered over 40% of Jordan's only coastal city with plans to cover the entire city in 2023.

Moreover, and as part of Aqaba Digital Hub's neutrality, the FTTH network is made available for other operators.

At the Forefront of Digital Transformation

Aqaba Digital Hub appears to be on a fast track to becoming the gateway for the Middle East, embodying the essence of having advanced and secure technologies via its telecom and technology arms. By offering interconnection and peering; subsea and fiber connectivity; cloud services; enhanced operations and networking; and satellite communications, Aqaba Digital Hub is the ideal go-to partner for digital transformation in the MENA region.

Moving forward, the Aqaba Digital Hub targets different sectors like education, telecommunications, gaming, OTTs, SMEs, governments, fintech, and CDNs to leap ahead and optimize its systems. The future is bright for the project that brings diversified connectivity pillars into one single source.

More information can be found at www.Aqabadh.com 



Vick Mamlouk, Senior Advisor, Rosenberger Technologies

PROSE: For Everyday Communication of People, Networks, and Data

PROSE, the spinoff of Rosenberger Technologies' antenna and wireless product portfolio, was announced in early 2022. We connected with Vick Mamlouk, the Senior Advisor at Rosenberger Technologies, to shed light on the essence of this new brand, their current business environment, and the growth outlook within the wireless industry.

As one of the latest initiatives in developing Rosenberger Technologies' international business for wireless products, can you explain the relevance and purpose behind the new brand identity PROSE?

PROSE means everyday language, and we noticed in the world today that communication is a comparable element to electricity and water. With life meant to be connected and made up of the small yet unforgettable moments, we felt it was important to establish ourselves that we're in the industry to connect people.

Rosenberger Technologies, from its origins, focused on connectivity solutions; making it one of the leaders in the industry. The wireless product portfolio was integrated into the mix in 2008 under the leadership of the same team that leads PROSE today. The focus is on wireless product portfolios that provide base station antennas and indoor wireless communications. We took the wireless communication vision and branded it as PROSE, allowing the company to focus on the mission to communicate in day-to-day life.

We have been in the telecommunications industry for a long time, and our product offerings have over 100 service providers worldwide. We have a clear understanding of the future market and how to adapt to change. Because of our market adaptability, we have been able to focus on communicating with people, networks, and data—all while providing great products and solutions.

With PROSE, we provide wireless solutions for service providers, enterprises, and private wireless networks. We want to be closer to our customers and help them make decisions quicker than ever. Customers now need unique solutions, and we can provide offerings based on their demands and needs.

In wireless communications infrastructure, the market is changing and the pie is getting bigger. Now you are not only serving service providers for their wireless needs, but you are also serving the enterprises that want their private networks. Our future is to help support the industry with Open RAN and active wireless DAS for indoor and outdoor solutions.

What is the current market position and business environment for PROSE?

We have four R&D centers in North America, China, India, and Australia, as we are focusing more on different future product demands for customers. We also have three manufacturing locations and more than 25 sales and project offices serving around the globe.

We focused a lot on Asia and expanded to the Middle East and India. Now with the expansion and the ability to be on our own, the market will allow us to open in Europe, Africa, as well as North, South, and Latin America. I am personally involved in Africa, which I see as the last frontier, and where we recently demonstrated an expansion in our customer base.

How does the company support its customers? What are the main needs that should be met?

Different customers need different things. In Africa, we are still talking about 3G going to LTE, but in countries like Saudi Arabia and the UAE, we are already talking

about 5G and 6G. In Europe, it's all about private networks. Manufacturers and enterprises are making their wireless networks.

I see that the future in the wireless industry would be connecting Open RAN to indoor solutions. You will have a brand new network that is not only controlled by the vendor or the service provider. Each enterprise can have its segment of frequencies and make its private network. And they want companies like PROSE to be able to serve these needs and say, "Okay, I can do LTE, I can do 5G, and our systems are ready for 6G."

Where would there be a huge demand increase and how would PROSE respond to this?

It depends on the market. When it comes to wireless networks, there are two things: capacity and coverage. The capacity is when you add sources like data centers and actual radios. While coverage is for indoor solutions and being able to cover public venues.

For instance, Asia has been more advanced in wireless communications because they have deployed 5G. Since there is a large population, capacity is required. While in Africa, there is less of a population but much larger areas—which require coverage. In Europe, dense areas require both better coverage and capacity.

In the future, I see heavy industrial companies as the most advanced in providing private networks. Whether located in Europe, China, or North America, you will hear companies have around 300,000 employees, on top of numerous data centers and factories equipped with robots. Those would require more private networks and wireless solutions.

Moreover, for indoor solutions, I see buildings set up with dedicated infrastructure to connect tenants and users. For outdoor solutions, they will prepare areas where they can put closets for telecommunication as data centers are coming to the edge.

All of this is happening to provide the PROSE way — everyday communication and easy services and installation for complete coverage.

What is the key to PROSE's success in the future?

First of all, I hope that COVID and supply chain issues can come to an end. Thus, the focus can go to bringing the investment back from the service provider and enterprise. What we have seen, in the last two years of the pandemic, is that we make sure communication is enabled everywhere.

Everybody is working from different locations, but they are communicating more and more, depending on the infrastructure. I see there is a major growth in the infrastructure, growing considerably between 10-15% a year, based on ABI and other worldwide market studies.

Service providers and enterprises are all part of the growth in the future. 5G will provide network slicing segments where each one will have its frequency spectrum. We hope that PROSE will be very successful by not only capturing customers and being able to meet their demand but also getting into more international markets. Each market has its particularities and challenges to keep things balanced and PROSE is here to provide the right wireless solution to serve its customers. ■■



We want to be closer
to our customers
and help them make
decisions quicker
than ever





Accelerating Modern Enterprise Digital Evolution

The transformation of digital economies in the Middle East and globally is opening up a variety of opportunities for ICT players. CSPs need to address the digital transformation challenges with a combination of strategic partnerships as well as powerful tools built to deliver the features required to embrace digitalization in an integrated manner. Whether it is telecommunication services, cloud, and security solutions, hyperscale data centers, manufacturing technology-based solutions, and systems integration, telecom companies are progressively finding ways to better their positions in the market.

Over the next 5 years, all growth in traditional tech spending will be driven primarily by four platforms – cloud, mobile, social, and big data/analytics. Cost savings generated by cloud and automation will see more spending

diverted towards new technologies such as AI, robotics, AR/VR, and blockchain. Next-gen security related to new technologies will also continue to drive significant growth.

More and more businesses are going the cloud-native way and there is much momentum for rapid adoption of new technologies which

deliver rapid return on investment for targeted industrial use cases such as the deployment of IoT and robotics solutions by manufacturing firms in regions such as China and the rest of Asia. In the Middle East, governments are driving investment in new technologies, leading aggressive smart city initiatives and integrating ICT with economic planning.



Moreover, as a strategy to navigate through disruptions such as geopolitics or virus outbreaks, CIOs are accelerating IT investments as they have understood the importance of flexibility and agility in responding to disruptions during the COVID19 pandemic. Global ICT spending reached about \$4.9 trillion in 2020 and is expected to grow to \$5.8 trillion by 2023. Worldwide IT spending is projected to total \$4.4 trillion in 2022, an increase of 4% from 2021. The latest Gartner forecast reports that in the MENA alone, IT spending is expected to hit \$169 billion in 2022, with communication services expected to attract a big chunk of the spending at around \$110 billion. Datacenter systems spending is expected to touch \$4 billion while devices will approach \$19 billion, IT services will top \$16 billion, and spending on software will be close to \$10 billion.

In due course, businesses are likely to grow their share of technologies such as IoT, robots/drones, AR/VR headsets as traditional and new technologies begin to exist together. Cloud and mobile technologies enable rapid deployment and connectivity whilst cutting costs and complexity in legacy operations which allows businesses to focus on new digital innovation. Analytics, blockchain, social, and AI represent traditional IT software applications that

leverage new technologies into tangible economic benefits.

In light of these developments, CSPs need to be the platforms for innovation. From their advantageous standing as connectivity providers with extensive networks, they have to leverage the cloud-native architecture and new technologies for building a new service with the development of minimal viable product (MVP) that can be scaled up at half the cost and effort of how new third-party services were traditionally rolled out on 4G.

As such, with the eventual rollout of standalone 5G deployments, an agile BSS can leverage a plethora of new functions and network attributes for the enterprise digital ecosystem. Packaging of network functions such as policy, real-time convergent charging, and service catalogues connect 5G business and IT functions and analytics within the 5G network, making it much easier to interoperate toward the monetization of the network. Network and IT teams will need to work diligently as policy and charging become closely integrated with core network functions, as 5G can enable policy to be positioned at the heart of 5G monetization. This enables CSPs to adapt the network for individual services, allowing the different network characteristics such as ultra-low latency; high bandwidth; and network slicing use cases to have different pricing, charging rules, and service level agreements.

According to Gartner, by 2026, 60% of large enterprises will use Total Experience (TX) – a strategy that creates superior shared experiences by interlinking the user experience (UX), customer experience (CX), multi-experience (MX), and employee experience (EX) disciplines to transform their business models to achieve world-class customer and employee advocacy levels.

All the developing and emerging markets in the Middle East have already started preparing for the digital economy in some form or the other. Forging strategic partnerships with key cloud services players such as Google, Amazon and Microsoft has

been on the agenda of governments in most countries. CSPs should focus on the 5G network capabilities of Network exposure function (NEF) to ensure secure, developer-friendly access to exposed network services and network data and analytics function (NWDAF) for a higher level of intelligence that makes networks smarter through real-time data management and analysis. Armed with such depth of insight, CSPs can find themselves in a leading position when it comes to tapping further opportunities for monetization and making a proposition on quality of service (QoS) in their portfolio offerings. **TR**



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Tech Talent: ICT Skills in Demand

The demand for tech talent is at its highest, as countries, including those in the Middle East, set ambitious digital transformation goals.

Cybersecurity, data analytics, cloud, and AI, are among the skillsets being looked into by tech companies for their digitally inclined workforce. From this comes a great potential for new value creation and continuous innovative approach.

Traditional employees are becoming less appealing to the eye of entrepreneurs as individuals who are specialized in the advanced technologies are expected to shape the

modern way of working and define the future economic outlook.

To cite an example, Saudi Arabia aims to be one of the top five countries globally in AI and requires 25,000 specialists' jobs in data science and AI before 2030. At the midst of a new golden age, the Middle East is on a path towards harnessing the full value of technology to benefit wide range of communities and industries.

With software and technology becoming mission-critical for businesses throughout the economy,

having the right tech talent is needed for companies to remain competitive in the market. Having said that, individuals must also rise up to the challenge and be equipped with the latest ICT skills needed to have an edge in the thriving job market.

Hyperscalers, tech start-ups, and non-tech companies are also winning a larger share of tech talents worldwide. Companies that adopt a winning talent strategy will have a powerful advantage as success is now not only dependent on technology products but also the skilled manpower.

Without a doubt, adequate ICT talent is required to accelerate digital enablement plans across the region, and promoting talent development is a shared responsibility of public and private sectors. This will benefit the society as a whole as we enter a more intelligent era.

ICT Skills Empower Digital Ambitions

According to a McKinsey survey, 87% of companies say they have or will have skills shortages within the next few years. And by 2030, this skills gap could cost the global economy \$8.4 trillion in lost annual revenue.

This shows how important it is to find, hire, and upskill global tech talents. Traditionally, having ICT skills only pertains to a person's ability to send an email, make a video call, conduct research via the internet, or install software in devices. As we see the need for diversifying talent clusters and the modern digital era becomes more interconnected and mobile-centric, digital skills must be developed to accomplish tasks, founded from their basic education and advanced training later on.

ICT skills become an integral part in youth's curriculum as they immerse onto a digital-based learning. In the Middle East, national governments and telcos, among other advocates, are ensuring that learners have the access to technological resources that allow them to become proficient in all ICT skills. This is crucial for higher levels of their education and in their careers.

Among the STEM subject coverage being taught nationwide is ICT, where the concept of using computers is broadened and is more focused on the way in which digital information is communicated. Interactive digital classrooms, collaborative cloud communications technology, skill-based studios and demo areas help the students in becoming hands-on and fluent with the latest technologies.

As these students progress and become suitable to work, their digital ambitions can be fulfilled with their ICT skills. These can be used to innovate business operations, improve

customer's online journey, attract more customers, and create opportunities that are more advantageous.

ICT Skill Areas for 2022 Onwards

From advanced robotics to cloud computing, cyber forensics, and blockchain, there really is an enormous field of skill sets to cover as tech talents spread to more fronts than being developers, data scientists and software engineers, among other technical roles.

The digital talent gap is still wide but by exploring new means of open collaboration and knowledge-sharing, competitive jobs and opportunities for innovation will continue to emerge. If you already have basic ICT knowledge but you want to improve your skills, here are some of the in-demand ICT skill areas that could be useful when demonstrated for tech job roles:

- **DevOps.** In today's cloud environments, developers and operations support personnel practice harmonizing and integrating DevOps throughout the entire lifecycle. Be knowledgeable and build expertise on source code management, configuration, CI/CD, containerization, and infrastructure-as-a-code.
- **Industrial Internet of Things.** IIoT includes the subset of IoT systems and applications that are deployed in industrial environments such as the manufacturing, energy, agriculture, and automotive sectors. You must thoroughly understand cyber-physical systems (CPS), intelligent assets, data communications, and advanced predictive and prescriptive analysis.
- **Automation.** Automation powers everything and builds trust through reliability and quick, calculated resolution. It is a must to have a know-how on scripting; APIs; containers and Kubernetes; network awareness; testing, observability, and monitoring; prototyping; and other cognitive skills to intelligently document, locate, classify, extract, and validate data.
- **Cybersecurity.** With businesses increasingly moving online and shifting to the edge of cloud, the demand for cybersecurity is high. A good cybersecurity professional must possess skills on operating

systems and virtual machines; network security control; coding; cloud and IoT security; security incident handling and response; and laws and regulations, etc.

- **Cloud.** Leading cloud platforms have its pros and cons and you must be able to differentiate between providers based on the different types of workloads to be done. A knack on programming languages; database management; AI/machine learning; data and application migration and deployment; and performance testing, metrics and analytics is critical.

It is important to continue learning and improving in the technology scene; where the only constant event is change. With change comes the requirement of additional knowledge and skills that would serve as the cornerstone for a forward-looking solid and smart economy. **IT**



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Technology Advancements Are Upon Us:

What Will the World Become

Technology advancements impact great things that will unfold in the next decade. In an increasingly global and digital world, combining physical and digital will be the norm. And data? It will remain the most valuable asset.

No longer restricted by proximity, innovations in the modern era will continue to bring people together, empower them, and make their life easier. As we focus on technology and platforms, it's worth considering that tech itself is not great on its own. What goes on around it and how this will affect individuals, enterprises, and communities matters.

Fourth Industrial Revolution technologies brought exponential change. It is anticipated to result in the next version of the world as we know it – programmable and automated. It's stimulating to be part of it. Yet, using digital technologies responsibly is the key to enabling innovation now and in the generations to come.

Technology advancements can only take us so far. It is a must to

construct or adopt standards, rights, and frameworks that would drive a trustworthy and fair usage and have an open mindset that its benefits will have the upper hand in supporting the new ways we live, learn, work and play.

Programmable

An anticipated change in the upcoming years is the internet being integrated into the world of technological (and physical) infrastructure. Content, data, applications, operations would all rely on codes and algorithms to function.

"We are moving to a future where it will also be possible to create digital representations of very large entities – like whole cities with their intricate infrastructures and sprawling activities," said Ericsson.

Indeed, algorithms have been improving and advancing for years. The experts don't see that momentum slowing down. Making the physical

as programmable as the digital world, control, customization, and automation are being instilled into the world around us.

Nokia also envisions a programmable world where all sectors around the globe experience the benefits of ICT. The programmable world provides an opportunity to improve people's lives. IoT applications in cities would possibly hit \$1.6 trillion in yearly economic impact by 2025. This can be done through automation, enhanced connectivity, and intelligence as well as industries becoming more efficient, agile, and responsive.

From writing software codes to running machines to compute efficiently, we are on the verge of programming the world; metaverse and Web 3.0 are already starting this. 5G rollout globally would fuel this giant technological leap through low-power, low-latency connected devices.

It's been claimed that the tectonic shift for the world ahead is not focused on bringing digital experiences into the physical world. It will focus on creating physical environments and experiences that are digital.

Moving into this new world of technology advancements, it's important to be business-ready. Enterprises would have to gain a deep understanding of the three underlying layers of the programmable world in the making – connected, experiential, and material. Over half of the global population has access to the internet and more IoT/edge devices would generate data that would be collected and analyzed at 5G speeds. New kinds of smart materials and programmable aspects would customize more products later on.

Combining IoT with online services also extends the idea of an API-programmable Internet to a programmable world. This is where automation of trivial tasks saves time and money as well as creates new value. In order to bring IT and IoT closer together, technology should blend event-based and query-based data in real time, not one or the other.

Technology that can be programmed is being interwoven with physical environments in sophisticated ways such as the convergence of 5G, augmented reality, smart materials, and connected devices that use sensors and other IoT technology to communicate with each other.

Even CommScope leverages the best-of-breed and leading-edge technologies and platforms for orchestration and automation. This is part of its commitment to building an open solution. CSPs create the programmable, automated, and intelligent networks of the future.

Automated

Forecasts predict that the AI market will grow to a \$190 billion industry by 2025. More so, global spending on cognitive and AI systems will be over \$57 billion in 2022.

Introducing technology advancements like artificial intelligence (AI), machine learning (ML), and robotic process automation (RPA) is now part of a solid business strategy. These results in increased productivity, higher rates of production, better quality service, and the efficient use of materials.

The International Society of Automation defines automation as "the creation and application of technology to monitor and control the production and delivery of products and services." In various sectors like manufacturing, health, real estate, education, transportation, and other utilities, these are apparent.

In the health sector, AI-powered technologies are helping to save lives, diagnose diseases and extend life expectancy. On the other hand, virtual and distance learning environments brought knowledge and training to unreachable students. Public services are also becoming more accessible and accountable as digital government transformation takes place. Ultimately, AI assistance and big data analytics are supporting technologies.

Automation crosses all functions – from installation, integration, and maintenance to design, procurement, and management. This is applicable in various elements including communications, cybersecurity, sensors, wireless applications, etc. In the long run, there is a need for a fundamental change in attitude toward automation and robotics. We should encourage more positive views, address the fear of change in the workforce and other areas, and be bolder in terms of business culture and strategy.

Telcos play an important role in supporting the full shift to automation. Deploying 5G becomes an enabler of more flexible and customized services. Bandwidth is certainly one aspect that must be delivered at a very complex speed, and having automation is a very critical part, said Pascal Menezes, CTO, MEF. "This technology has the ability to bring everybody together and deliver supply chain provisions."

Along with that, technology advancements powering automation are getting cheaper. B-Yond believes that we are in an era where we must introduce "comprehensive automation by leveraging the power of AI."

Improvements in computer hardware components such as semiconductors and the development of more advanced software for AI, ML, and robotics pave the way to properly interpret and process loads of information in the complex ways needed to power automation.

In terms of technology advancements, even the next wave of digital tech aka smart tech has the potential and power to actually help rehumanize work. Smart tech and humans are not competing with one another, contrary to traditional belief. In fact, they are complimentary, but only when the tech is used well. They make the decisions, with people in mind.

What automation can change for the better is redesigning jobs and reengineering workflows to enable people to focus on the parts of work that humans are particularly well-suited for, such as relationship building and problem-solving.

Humans are still going to be human, but there will be more opportunities to improve the quality of human life. It is too late to go backward, and we must embrace technology to improve much more.

To cite an example, implementing intelligent identification and fault detection can help prevent and predict faults that can be detrimental to businesses. "Verifying these capabilities with our partners enriches our model database and abilities, allowing us to make better and more precise predictions," said Vanness You, Vice President, Huawei Middle East Carrier Business Group.

Overall, automation will bolster connectivity and reliability in a hyper-competitive ecosystem. Truly, the future of automation looks promising where everything is accessible and readily available. **TR**

Data Centers:

Power Hungry but Efficient

Data centers that support businesses, internet services, and our social media lives consume a lot of energy. The latest statistics show that data centers now consume more electricity than rural homes. According to the Central Statistics Office (CSO), consumption of electricity by rural households increased by 2.6% in 2014, while consumption of electricity by data centers increased by 8%. This means that rural homes now use 12.2% less energy than data centers. As their numbers grow, data centers must become more energy-efficient and reduce their environmental impact.

O **verview Look** Today, nearly all the world's IP traffic goes through data centers. Cloud computing, artificial intelligence (AI), 5G mobile networks, self-driving cars, and cryptocurrency mining all generate large electricity bills compared to the simple Google searches of the past. Streaming services alone could make up 87% of consumer internet traffic this year, according to the International Energy Agency's. Moreover, it is not surprising that the majority of this electricity usage is driven by few companies; On the top are US tech giants Amazon, Microsoft, and Google, followed by Facebook and Apple.

"Data centers can scale from being small for an individual organization up to handling the traffic for global conglomerates such as Amazon with hundreds of millions of consumers and product data," said Richard Blanchard, a lecturer in renewable energy at Loughborough University's



school of mechanical, electrical and manufacturing engineering.

On another note, the ongoing Coronavirus pandemic has only reinforced their dominance and use through remote work, video conferencing, and file sharing over the cloud services.

Furthermore, automation and digitalization are making it possible for more and more rural homes to be equipped with electrical appliances and devices. In order to ensure that they have reliable power, these homes demand high-quality electricity service from their utility companies. The same goes for data centers that operate in these areas, and high-quality electricity service is essential to ensure the smooth operation of a data center's critical infrastructure.

Why Do Data Centers Use So Much Energy and Why Are They So Important to Business?

Currently there are 7.2 million data centers in the world, according to the German statistics office. The US has

2,670, by far the most, followed by the UK with 452, Germany with 443, China, the Netherlands, Australia, Canada, France and Japan. Data centers need electricity to run their equipment, and keeping the machines cool requires a lot of electricity; just how much electricity all these data centers use is up for debate.

At this time, many experts estimate that data storage and transmission in and from data centers use 1% of global electricity. According to the International Energy Agency, this share has barely changed since 2010, even though worldwide internet traffic has increased 15-fold since 2010. Furthermore, in the world of business IT, data centers are designed to support business applications and activities that include: Email and file sharing, enterprise resource planning (ERP) as well as databases, big data, artificial intelligence (AI), and machine learning, virtual desktops, communications and collaboration services, etc.

A rising surge

The International Energy Agency estimates that 1% of all global electricity is used by data centers and that by 2025, data centers will consume 1/5 of the world's power supply; the world's demand for internet and smart technologies is increasing rapidly. At the same time, power usage within the information industry is growing rapidly. This makes it vital that we reduce electricity consumption in data centers and implement more efficient energy solutions to create sustainable data centers and cut CO2 emissions.

Last year, data centers consumed more electricity than rural homes in the State, according to the latest statistics. As a result, the share of metered electricity consumed by data centers has almost tripled in just six years, from 5% to 14% last year, meaning that by comparison, urban homes accounted for 21% of metered electricity consumed in 2021 compared to 12% for rural homes. The electricity consumption by data centers last year represents an increase of 32% in that year.

Data centers consumed 265% more electricity in the three-month period between October and December 2021 compared with the three months between January and March 2015. Over the six-year period, metered electricity consumption increased by 16%, with data centers accounting for 70% of that increase.

"The increase in consumption was driven by a combination of existing data centers using more electricity and new data centers being added to the grid," said Niamh Shanahan, statistician in the CSO's environment and climate division. Businesses and regulators must work hard as data generated by social networks, online shopping, consumer devices, and B2B sector continue to grow. **IR**



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New Digital Hotspot: Emerging Virtual Cities

It seems like cities' continued growth and success are one of the great triumphs of modern civilization, with the future of design becoming virtual and driven by data.

Observing an evident shift in today's world, people are moving from rural to urban centers at a rate of 1.3 million per week. Without a doubt, with the development of the 4IR, the path of urban development and transformation is becoming increasingly clear. This is where digital technology becomes the main driver while data is at the core of generation, collection, and analysis.

The use of digitalization and connectivity makes it possible to design cities based on virtual models, making them more liveable, smarter, and sustainable. Thanks to the spread of the Internet of Things (IoT), devices, and the different elements which make up a city can communicate with each other

and improve their functions. Cities are now expected to be served by complex systems of interconnected assets and networks – a system of systems.

Talking about virtual and smart cities, the concept of a digital twin is now being explored more than before. In fact, ABI Research expects that by 2025, roughly 500 cities will be using digital twins. It is foreseen that there will be an integration of different specific digital twins of smart buildings, traffic infrastructure, power grids, and water management systems.

By definition, a digital twin city is a digital counterpart of a physical city through the construction of a virtual version. This innovative model aims to address various challenges through accurate mapping, analytical insight, virtual-real interaction, and intelligent intervention.

Sooner than later, key assets and ongoing projects like construction sites, roads, and bridges as well as dynamically-evolving situations like crowd control, traffic, housing, and crime would be managed through virtual cities. Still, in its nascent phase, regulations; standardization; and further collaboration are still needed to make cities available, both offline and online.

Cities in the Metaverse

Innovation and digital empowerment are crucial to transforming modern cities. With the emergence of the metaverse, which consists of 3D virtual worlds where people can interact, do business, and form social connections; it becomes the ideal place to build digital cities.

Betting big on digital properties, UAE-based Damac Group has

announced its plans to invest \$100 million to build digital cities in the metaverse – the first among the GCC to do so. Known as the tech hub of the Arab World, Dubai is also one of the pioneers in embracing the concept of the metaverse, virtual assets, cryptocurrencies, and blockchain, alongside other emerging technologies. Metaverse Dubai, the first global virtual platform based on a real-world map, has the goal of building a virtual megacity that reflects the real-world Dubai's vast cultures and diversity.

It is necessary to establish a strong virtual community within a collaborative and user-driven space. In the Kingdom of Saudi Arabia, the future cognitive city of NEOM will enable a ground-breaking, mixed-reality model for urban living. "The whole purpose of NEOM is to be this collaborative, inclusive, human-centric place for people to interact," stated Joseph Bradley, CEO of NEOM Tech and Digital Company. "It's not really [about] megacities anymore—its meta cities."

With a dynamic digital twin, immersive mixed reality, and digital assets marketplace, NEOM reckons its own cognitive metaverse to fuel diversification and unlock significant economic opportunities for itself, the Kingdom, and its global partners.

Urban Infrastructure

There is a great interest in new towns and cities springing up in cyberspace, constructed with digital bricks and mortar. The increasing development of 3D virtual city models and leading-edge computer software applications is providing innovative possibilities in the design and assessment of digital city squares.

Existing and emerging tools can simulate a number of performance aspects such as pedestrian movement, noise level, wind movement, and temperature that show scope for integrating virtual city models. Looking at the bigger picture, an urban infrastructure consists of sensory, connection, storage, computing, and converged aspects.

Realizing the potential that digital cities are the cities of the future, an urban infrastructure must be able to facilitate an intelligent, inclusive, efficient, entrepreneurial, sustainable, and safe environment.

Every digital city has a unique journey, and in the virtual world, the built environment must be self-sufficient as the participants are wholly dependent upon the tools supplied in it. We can bear in mind that a virtual city is endlessly mutable. Thus, its structure can grow and change at faster rates and its appearance may be highly subjective and tailored-specific.

As technology advances, the recreation of the experience and feeling of actually being there despite not being physically present is attainable. Simulation builds a bridge between concept and reality and urban planners utilize this to create something meaningful and accessible, needed to evaluate multiple visions and build consensus.

With a collaborative approach to urban transformation and the capability to integrate, understand, and harness complex data; the entire city ecosystem benefits. An integrated virtual environment provides a holistic and operational vision for mobility, energy and resource management, and citizen services, among other systems.

To cite an example, the top three application scenarios in digital twin city construction are public services or management; community development; and intelligent buildings.

Network facilities such as 5G, ultra-sensing, and optical networks provide channels for complete interconnection and multi-level data storage and cloud data centers. On the other hand, advanced computing facilities provide reliable data processing as full-volume data resources are the key components of the physical city's digital twin.

How to keep the virtual city model relevant and up-to-date? One instance is mapping and remapping the landscape continuously, relying on the collected and analyzed core datasets as well as available funding.

Integrating Tech for a Better Way of Life

By and large, ICT would revolutionize the way cities are managed – from the use of AI, IoT, big data, virtual reality, and other connectivity technologies. Together, with human actors, technology innovation could be done immensely online.

If we look at monitoring roadside infrastructure and traffic flows, this can be automatically and effectively managed virtually to make better informed and faster decisions. The use of supercomputing technologies, combined with engineering techniques and detailed traffic flows, is useful in generating a virtual city.

Predictive health and digital government are also important for virtual cities as it involve the residents and public sector concurrently. Delivering public services is deemed to be more streamlined when computer-generated.

Through virtual reality (VR), tenants or homeowners can take tours and envision a living space and its surroundings as though they were actually there. The opportunities in which VR can offer to the world of building technologies are limitless with elements such as light, heat, safety features, and security and access controls that could be simulated in a VR environment.

In this way, the assessment and identification of areas for improvement can be done quickly. As VR technology matures and becomes more accessible, urban living will be more transformative and challenging as it needs to be virtual and real at the same time.

Governments, enterprises, tech companies, and all other digital players should be more open to collaboration in business model innovation, and shaping a robust foundation of the digital metaverse. Truth be told, a digital twin or virtual city is the perfect combination of ICT technology and human civilization, but making it last for the generations to come would require strategic ventures to be successful. **TR**

du Supports Transformation to a More Sustainable Society



du, from Emirates Integrated Telecommunications Company (EITC), celebrates World Environment Day by implementing multiple initiatives to encourage employees to be environmentally cautious and support the transformation towards a more sustainable society.

du uses 100% recyclable bags at its retail stores to promote the use of more environmentally-friendly substitutes and engage the employees and the customers to

raise public awareness. Moreover, du leverages innovation to create solutions that reduce the environmental footprint of network infrastructure, such as using hybrid generators and free-cooling systems to decrease diesel consumption and using solar power to run a number of sites to ensure energy efficiency. Its renewed sustainability framework is focused on helping the UAE achieve its National Agenda, particularly its ambitions toward building a "greener" society as part of a sustainable future.

Adel Alrais, Head of Corporate Communications & Protocol – du, said, "We have long been a proud supporter of the UAE leadership's strategic plan to achieve sustainability, and have implemented many initiatives to help achieve those goals with cutting edge technology and innovative services. Our sustainability objectives guide

us towards achieving our vision to add life to life by helping us deliver the benefits of ICT to everyone, make our people happier, and operate ethically and responsibly. This World Environment Day, we are empowering everyone to take small, everyday actions to preserve and restore our ecosystems and foster a more eco-friendly society as part of our efforts toward a sustainable future."

The World Environment Day 2022 global campaign #OnlyOneEarth calls for transformative changes to policies and choices to enable cleaner, greener, and more sustainable living in harmony with nature. To achieve this goal, Abu Dhabi has implemented a ban on single-use plastic bags with Dubai to follow in July. Additionally, in an effort to reduce devastating and costly environmental impacts, the UAE aims to lead the way in ending plastic pollution.

Zain Business Limited Gets CITC Approval for Tower Deal



Zain Business Limited, a Zain KSA subsidiary, gets approval from the

Communications and Information Technology Commission (CITC) to

acquire at least 8,069 of the telecom tower sites owned by Zain KSA.

This announcement comes months after Zain KSA's board of directors has approved the binding offer submitted by the Kingdom's Public Investment Fund (PIF) led consortium to acquire an 80% majority stake in the telco's passive tower infrastructure, worth SAR 3.026 billion (USD 807 million).

In accordance with the rules and regulations, Zain Business Limited must first complete the necessary procedures to obtain a license that allows it to provide wholesale services for infrastructure (Class A tower and masts).

In retrospect, the agreed-upon consortium offer will see the PIF secure a 60% stake while Sultan Holding Company and Prince Saud bin Fahd bin Abdulaziz take a 10% stake each. Zain KSA will own the remaining 20% stake, with the PIF having a call option to buy this remaining 20% for a specified amount.

Zain KSA and University of Tabuk to Empower Youth, Support Education, and Innovation



Zain KSA has signed an MoU with the University of Tabuk during the International Conference and Exhibition for Education (ICEE) to support collaboration and channel deeper expertise to encourage education and empower youth in the field of information and communication technology (ICT). The MoU serves the national strategic goals of developing human capabilities to keep pace with the Kingdom's digital transformation and unlocking more employment opportunities for the youth of Saudi.

This MoU will enable Zain KSA and the University of Tabuk to develop a comprehensive work plan which includes establishing a "Research Chair" as well as a customer service branch for the university's staff and students, in addition to providing job opportunities and specialized training programs for the students.

Commenting on the MoU, Zain KSA's chief business and wholesale officer, Eng. Saad bin Abdulrahman Al-Sadhan, stated, "The agreement delivers actionable insights and extends the executive plan of Zain KSA's corporate sustainability strategy which focuses on empowering the youth of our beloved country and guiding them along the right path to acquire technical skills necessary for their success in a future driven by technology and innovation. Our company has always been an incubator for national talents. We have created job opportunities and fostered a work environment that supports our youth to thrive and innovate, thereby contributing to 'Saudi Vision 2030's Human Capability Development Program.'"

On his part, His Excellency, the president of the University of Tabuk, Dr. Abdullah bin Mufreh Al-Dhayabi, declared, "Our collaboration with Zain KSA, one of the Kingdom's leading telecommunications and digital services providers, is a great step forward. Remarkably, the company has for so long supported digital transformation across the Kingdom, providing the latest technologies and innovations in the 5G network, thereby

cementing the Kingdom's pioneering position on the global ICT map. We will work relentlessly side-by-side to expand research at the University of Tabuk and to create opportunities for on-the-job training (OJT) for our students. This will support them to gain a solid knowledge base to fulfill their ambitions and achieve new levels of productivity, while also helping them to contribute to advancing our nation's position amongst the most progressive countries in the world."

Zain KSA's initiative – which is part of the company's corporate sustainability strategy – supports the national education goals in seeking to empower the Kingdom's youth. It also aligns with the "United Nations' Sustainable Development Goals" in terms of economic development, job creation, and investment in innovation. To this end, Zain KSA has supported several youth empowerment initiatives. It has sponsored the "National Olympiad for Scientific Creativity" (Ibda'a) in addition to the "Make it and Play it for Youth" competition and ThinkTech, an initiative by the ministry of communications and information technology (MCIT) in collaboration with the Saudi Arabian Federation of Electronic Sports (SAFEIS).

First MVNO in Kuwait Officially Launched



The first MVNO in Kuwait, Virgin Mobile Kuwait, has been officially launched, over a year after it received its approved operating license from the Communication and Information Technology Regulatory Authority (CITRA).

Under the arrangement, Virgin Mobile Kuwait will operate using stc's network, with stc acting as a Host Facilities Based Provider "FBP". Releasing its fully digital app-based proposition in Kuwait, this milestone makes Virgin Mobile Kuwait the first MVNO to enter the market and the fourth service provider in the country. This is also a testament to the evolution of Kuwait's telecom industry for innovative new mobile services.

In line with the Virgin Mobile MEA's focus on sustainability, Virgin Mobile Kuwait customers will receive a

biodegradable SIM card when they sign-up.

Commenting on the launch of the first MVNO in Kuwait, Erik Dudman Nielsen, Founder & Group CEO at Virgin Mobile MEA said that this is "another step in our regional expansion plans, bringing high-quality, digital services to the community."

Wafra International Investment Company, Impulse International for Telecommunications, and Virgin Mobile MEA provided the funding for the first MVNO in Kuwait to operate.

Surface Under Attack: Addressing Digital Safety



As society continues to move into the digital world, the threat of cybercrime looms largely, exceeding the global cost of \$6 trillion in 2021.

In the past, the attack surface was mainly internal and stayed within a well-defined and fortified perimeter. But as today's interactions between employees, customers, and other firms are increasingly taking place online, the attack surface expands at a faster pace while incorporating internet-facing assets.

As our reliance on digital technologies grow and Web 3.0 becomes reality, initiatives aimed at protecting cyberspace activities intensify. World Economic Forum's Global Risks Report 2022 even revealed that businesses operate in a world in which 95% of cybersecurity issues can still be traced to human error, and insider threats represent 43% of all breaches.

Despite the benefits of digital technology integration like IoT; big data analytics; cloud computing; and AI for collaboration; scalability; and

cost-efficiency, these applications are complex and open up an enterprise to more digital vulnerabilities and threats.

Digital security risks are typically caused by digital platform usage, the physical environment, people, and the organization's digital ecosystem as a whole. These could gravely affect data integrity; confidentiality; and availability; preventing enterprises from integrating successfully into emerging digital platforms — or worse — halt their operations and put people at risk.

For modern businesses, the wider the attack surface is, the higher the organization's risk for breach. Taking into consideration the widespread dependency on digital systems, teams should be aggressive and ceaseless in preventing and managing these escalating cyber threats.

Digital Attack Surface

It is a no-brainer that anything on, based, or connected to the internet

can be attacked one-way or another. Indeed, nowadays, perpetrators are more sophisticated than before. In a matter of seconds — and just a few clicks — an organization's digital attack surface can be compromised.

To put it simply, digital surfaces include any IT and web application infrastructure, run internally or under third parties. Having said that, the digital attack surface is where hackers, threat actors, or unauthorized users can exploit an organization's underlying digital systems.

The digital attack surface, with its maze of interconnected online assets, is a popular target for cybercriminals. In fact, most SMEs have hundreds of internet-facing assets that are potentially susceptible to attack.

These involve every computer or device connected within an organization's network as well as all the servers, databases, and access points on cloud

platforms, data centers, and operating offices.

In parallel, businesses continually expand their web presence with new projects, supply chains, customer support services, tracking mechanisms, and social media campaigns, among others. Dynamic cloud applications handle app workloads while hundreds of new devices with IP addresses can be brought online at any time. These activities create conditions for new security issues to emerge.

To prevent scenarios of sensitive data exposure and manipulation; ransomware incidents; and network shutdowns, monitoring the digital attack surface is crucial. There should be a regular analysis to mark high-risk areas that needs vulnerability testing; identification of existing and new attack vectors; classification of which types of users can access each part of a system; and mitigation against targeted cyberattacks.

Attack Vectors

Prioritizing vulnerabilities helps with reducing digital security risks. Most companies have tons of vulnerable attack vectors and having the visibility or threat intelligence necessary to secure these points is a must.

Listed below are the most common pathways used by a hacker to illegally access a network:

Passwords. Using weak or reused passwords on online (personal or corporate) accounts is very unsafe. Compromised credentials should be fixed immediately because once acquired, attackers can navigate without being detected for a certain period and possibly cause significant damage.

Malicious Software. Causing errors, slowing down computers, or spreading viruses hit organizations from time to time. The risk of malware increases as the attack surface becomes bigger, allowing more vulnerability to unauthorized access and control of network resources.

Encryption. Deploying poor encryption can result in sensitive data being uncovered easily. If the protocols in place are missing or quite ineffective, data transfers become unprotected which can cause hackers to decrypt information in less time and conduct other man-in-the-middle attacks.

Overlooked Assets. Leaving unused or forgotten domains and subdomains under the rug could be problematic later on when utilized by cybercriminals. It is better to terminate these platforms as expired certificates and software could link to a company's IP or storage domain unnoticed.

Shadow IT. Having no security control over systems or cloud app subscriptions should be watched closely to avoid unnecessary permissions, provision of services, and migration of workloads and data. Without proper vetting of new technologies, apps and tools could be risky to a business' operation.

Misconfigurations. Accounting for over 80% of security vulnerabilities, bypassed configuration of web apps, networks, and cloud cause loopholes. Previously, a misconfigured cloud storage bucket exposed thousands of mobile phone bills of telco subscribers due to human error and misconfiguration.

Takeovers. Recognizing abandoned subdomains and servers could be beneficial to cyber attackers. Once inside, they can easily ruin the organization's reputation by claiming their identities and kick starting dark web sales, unsolicited campaigns, and other malicious transactions.

Phishing. Receiving a text or email from what appears to be a trusted sender should still be inspected as this attack vector can lead to giving up valuable information. Phishing messages typically contain a malicious link or attachment that steals users' passwords or data.

Insiders. Handing over network access to attackers from employees could also happen, either due to carelessness, personal motive, or revenge to

dispute. 96% of companies experience challenges in protecting corporate data from insider threats like sabotage, fraud, theft, and espionage.

Course of Action

In a vastly interconnected society, digital security threats and vulnerabilities require continuous efforts to identify, analyze, and measure. As infrastructures grow in complexity and cybercriminals are deploying more sophisticated methods, here are some steps to follow to reduce risk and alleviate impact:

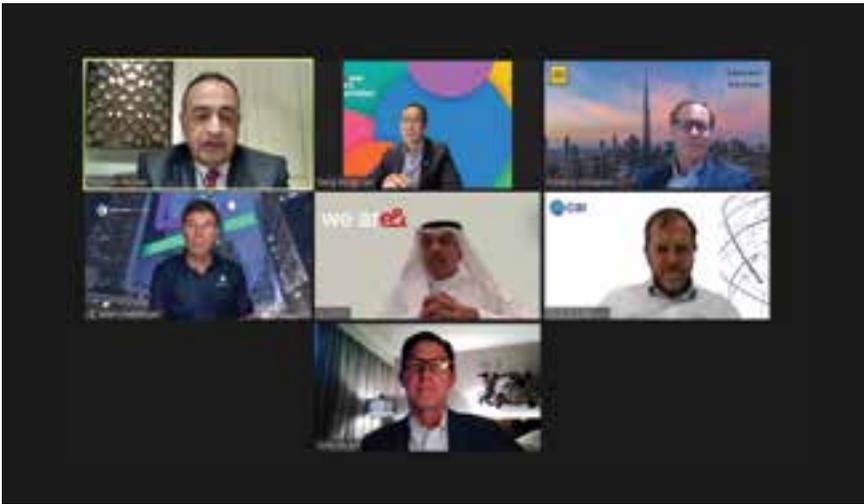
Control Who Is in Control. The zero-trust security model ensures that only the right people have the right level of access to resources at a given time. This reduces the number of entry points and guarantees that only authorized individuals can access the organization's systems.

Scan, Spot, and Segment. Regular network scans and analysis enable organizations to quickly spot potential issues deemed for both cloud and on-prem networks. Micro-services and firewalls also add additional barriers and divide the network into smaller units for a stronger defense.

Educate Staff. As the front liners against cyberattacks, offering regular cybersecurity awareness training to employees will help them understand the latest trends and best practices in the industry. Categorize them into types and permissions and use these as a reliable performance metric factor.

Secure Reporting. Be as thorough as you can in dealing with breaches and threats. In this way, the company will become safer and more alert when it comes to digital network usage. Digital safety should be on top of the team's agenda by tightening protocols and conducting routine cleanups.

Take Care of Backups. Use strict protection protocols to keep data, code, and other strict and confidential info backups safe by doubling down on security measures. Make sure that the backups couldn't be tampered with without triggering an alarm and requires special admission for entry. **TR**



Telecom Review's Webinar Demystifies the Wholesale and Capacity Industry

The importance of the wholesale business has been put under the spotlight as capacity demands increase. Industry leaders convened to discuss the role of the wholesale and capacity industry and if it's gaining more ground in the digital era.

The panel gathered the following speakers: Frédéric Schepens, CEO, MTN GlobalConnect; Marc Halbfinger, CEO, PCCW Global; John Nolan, Vice President – Global Connections & Alliance Management, AT&T; Cengiz Oztelcan, CEO, GBI; Ali Amiri, Chief Carrier & Wholesale Officer, e&; Lim Seng Kong, Managing Director, Singtel Enterprise Business.

Moderating Telecom Review's virtual panel entitled "Rethinking Wholesale and Capacity in the Digital Age," was Toni Eid, Founder and CEO of Telecom Review Group, with Marc Halbfinger, CEO, PCCW Global, kickstarting the panel session.

Halbfinger said, "I think that we're seeing a huge demand for subsea, terrestrial, and RF capacity." This demand is said to be driven by a few areas such as the advent of 5G in the mobile layer, the dramatic influence of cloud computing and virtualization, and the expectation that bandwidth itself will continue to expand.

Metaverse has been a recent buzzword that could also impact the bandwidth capacity and latency demands, coupled with the large number of cloud ecosystems taking hold as a component for digital transformation.

"There is a demand for more digital infrastructure at the data center level which feeds the capacities, requiring more power, and demand for connectivity inside and outside jurisdictions, domestically and internationally. These are all designed to feed the continuing spectrum of ICT evolution," explained Halbfinger.

Be of the same mind, Seng Kong Lim, Managing Director, Singtel Enterprise Business stipulated the exponential growth of capacity moving forward. But the point he raised is that with this demand, who will be providing the supply. Due to the presence of other players like OTT, "the role of telcos is impacted as one of the big roles for us to play is capacity planning." But with different parties come different motivations.

As telcos' role diminishes, repositioning is important. Considering the supply in the market, telcos still need to play their role to ensure that "traffic goes to the right places and customers are well served."

Frédéric Schepens, CEO, MTN GlobalConnect briefly gave a preview of how the company is carving out its fiber infrastructure and data centers. Focused mainly on the African region, the role that they are playing is part of their Ambition 2025. "We really look at how we can fast track and leapfrog the digitization program in the continent," expressed Schepens.

The African continent still has a tremendous amount of excitement and journey to digitize and make sure that the required capacity is in place, compared to the Middle East, Asia, and the US.

The latency is still a major issue, Schepens added, which is why submarine cables are booted up around the continent. More so, the highways of tomorrow — digital railroads — are being built from east to west, aiming to reduce the latency from 150 ms to 20-40 ms.

"This is what we actually need in order to set up a digital environment," highlighted Schepens. In line with this, MTN GlobalConnect has opened up its proprietary networks of over 85,000 km of fiber in the ground to anyone who wants to use it in a neutral way.

Global companies are known to have entered Africa, generating more content, while online gaming is also on the rise. Having said that, "The demand is actually getting bigger and bigger and as an industry player, it's our duty to continue that journey. We at MTN firmly believe that everybody deserves a digitally connected life," Schepens articulated.

Following the trail of the conversation, John Nolan, Vice President — Global Connections & Alliance Management, AT&T mentioned that "applications and companies that are driving closer to the edge don't mean a lot unless there's connectivity to the end-users."

Nowadays, when you lose connectivity, it's like you've lost oxygen. Everybody has gotten accustomed to bandwidth and connectivity.

With this in mind, the unique role that wholesale business plays is selling that capacity as an anchor tenant in a build. "Wholesale is a critical component for all of us to continue investing at record levels and be able to ultimately serve our customers," Nolan remarked.

For Cengiz Oztelcan, CEO, GBI, the wholesale business industry is still playing the same role they're at since decades ago. "It was always crucial, it was always important but the awareness was not there."

Today, more and more people across the telecom and IT industry realize the importance of wholesale business. But being put under the spotlight is a double-edged sword. "It gives us a lot of pride in the work we do yet also gives a bit more pressure on the industry, especially for technicians and leaders like ourselves," Oztelcan commented.

Helping consumers as well as enterprises to thrive is a continuous process that keeps on growing, affected by new inventions. "The underlying fact is we've always been there and we will always be there."

On the other hand, Ali Amiri, Group Chief Carrier & Wholesale Officer, e& laid out that the wholesale business as an industry is somehow seen as a black box, and that during the pandemic, "wholesalers are enablers of all the digital players."

Without a doubt, enterprises, consumers, and hyperscalers now rely more on better connectivity with low latency. "Our role has not changed much in terms of bringing the best and seamless connectivity, but enabling digital cloudification couldn't have been possible without the wholesalers."

Whatever industry it is, the whole world is depending on the wholesale business for the right kind of capacity

— whether subsea or terrestrial — it will offer.

Then the moderator asked about why we're seeing now subsea cable systems moving into an upward trend. Marc Halbfinger said that the driver for subsea capacity growth is undoubtedly the cloud and its applications with the need for storing and computing to bring connectivity to the end-users. However, he said that in several years, some in the wholesale industry have looked at subsea capacity as an area that facilitates the sector's retail businesses. He argued that it also represents a source of revenue and profit in the industry.

"In the last seven or eight years, some of the western clouds have viewed subsea capacity solely as a cost, and what we've seen is a push-down in the actual price per unit as the trajectory of value has shifted for some of the user bases of subsea. A large amount of the construction of subsea that has come about in that period has been driven



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RETHINKING WHOLESALE AND CAPACITY IN THE DIGITAL AGE

JUNE 2nd

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PANELISTS

MODERATOR

Frédéric Schepens
CEO, MTN
GlobalConnect

Marc Halbfinger
CEO,
PCCW Global

John Nolan
Vice President
- Global
Connections
& Alliance
Management,
AT&T

Cengiz Oztelcan
CEO, GBI

Ali Amiri
Group Chief
Carrier &
Wholesale
Officer, e&

Lim Seng Kong
Managing
Director,
Singtel
Enterprise
Business

Toni Eid
Founder and
CEO, Telecom
Review Group

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directly by the clouds and not using the traditional licensed service providers as intermediaries."

Cengiz Oztelcan said that GBI is a company that solely invests in submarine systems and networks and regarded it as a Capex heavy industry and a "difficult business to be in." He felt that despite the challenges, many new players have come into the business in the last 10 years and that there was a tremendous upward trend with multiple new projects in execution or planning phases in every region.

On the demand side, he said hyperscalers are part of the subsea

segment. "Subsea capacity gives the ICT and telcos the power to compete. Telcos in any part of the world may be connected to a beautifully crafted and designed system of subsea to the data centers, cloud, and content players so that they can compete with any other telcos in the world," he said.

Another area of discussion during the panel was how the wholesale industry can contribute to business growth.

John Nolan said that AT&T is laser-focused on providing the best connectivity in fiber or wireless for

their global customers and without the wholesale industry it cannot serve those customers profitably. He said that the combination of cost-effectiveness, competition, and quality in the wholesale industry contribute to the overall business growth.

Ali Amiri said apart from the core wholesale business, today, it is the enabler of all the cloudification and digital projects for enterprises and customers.

"The gap between enterprise, customers, and wholesale is also diminishing." He pointed out that

apart from the traditional services of voice, messaging, roaming, wholesale is also responsible for generating new business growth through customer experience, cost-saving, etc.

Lim Seng felt that there was no need to worry about growth. He said that there are so many things going on and data flow is going to explode. "5G, metaverse, autonomous vehicles, drones, smart manufacturing, etc are pointing toward a huge exchange of data." He highlighted that the lack of a supply line should not be a bottleneck for growth. "This is something that we should think long and hard about."

Recently, the number of data centers has tremendously increased, including in the Middle East. Toni Eid, the panel's moderator, asked the panelists about their opinion on why has the number increased lately.

Frédéric Schepens said that from the sub-Saharan context, MTN GlobalConnect has around 65 data centers in 20 countries and is looking further to fine-tune that presence by 2025 through joint ventures and partnerships.

Ali Amiri said only data centers can accommodate the huge demand of data traffic flow generated as a result of cloudification and digitalization. In the MENA, we see a lot of data centers availability and plans for the future as well.

Finally, the panelists concluded the discussion by tackling the improvements they recommend for the wholesale sector in their regions.

According to Cengiz Oztelcan, CEO, GBI, content is driving the demand, thus drives the need for capacity and the exploding number of data centers in the region. "Single-handedly regulatory frameworks can isolate a company from a country from being part of this journey, so every single country should try to look at the regulatory framework."

On this note, John Nolan commented, "My belief is that the wholesale industry hasn't moved fast enough to

transform our business and some of the work that's currently underway is helping to rectify with the Math APIs".

Marc Halbfinger then took the floor. "The automation of both the technical interface and the commercial interface between and among service providers of different component elements in the ICT food chain should be improved. But rather between and among network-based service providers and cloud between cloud and application between application and service provider. Thus, it requires a complete reorganization of the industry and it requires a lot key leaders and industry segments to come together.

"Against that desire, investment bankers' analyst management consultants, and even boards of directors in the companies are pushing for segregation of the wholesale industry, and that can be the data center infrastructure. Unfortunately, although as a network service provider, it's not just building physical infrastructure, we also need to be aggressive in building software, code, and understanding that in today's world code solves problems more than hardware and capital."

Moreover, Singtel Enterprise Business' Managing Director, said that Asia is a very diverse region and has a different culture regulation. Digitalization, capacity, AI will have a huge impact on economic development. Asia doesn't have enough collaboration to help increase coverage of cables, because the landings are usually in few locations and many countries are being left out. It's because of their own regulations or the country's politics. Collaborations, whether between the regulators or the industry players, can help improve the coverage of cables in every country in Asia.

Ali Amiri, Chief Carrier & Wholesale Officer, e&, also commented on this topic, "the wholesalers have to work to improve going from legacy to the new areas, and to balance the growth that they've been adding to their individual companies".

Frédéric Schepens concluded that interoperability has always been one of the keys and hurdles in growing GDP economies, and the well-being of this planet, and as a community. The second issue is phasing of technologies, which is not always well-aligned. "I'm still running with a lot of 2G/3G networks and we've just barely started on 5G in certain markets, which means that customers won't be able, in certain cases, to operate as they should be in various countries." **TR**



It's not just building physical infrastructure, we also need to be aggressive in building software, code, and understanding that in today's world code solves problems more than hardware and capital



Huawei Holds Over 70% of Data Center Market Share in Middle East



Huawei revealed its next-generation data center facility, alongside the launch of PowerPOD 3.0, a brand-new power supply system. Based on the joint efforts between Huawei Data Center Facility Team and industry experts, these endeavors reaffirm Huawei's commitment to building low-carbon, smart data centers.

Charles Yang, Senior Vice President of Huawei and CEO of Huawei Data Center Facility Team, has introduced the groundbreaking definition of the next-generation data center

facility and highlighted its four main characteristics: sustainable, simplified, autonomous driving, and reliable. Accordingly, Fei Zhenfu, CTO of Huawei Data Center Facility Team, explained the essence of Huawei's new-generation power supply system, known as PowerPOD 3.0. The system reduces the footprint by 40%, cuts the energy consumption by 70%, shortens the delivery period from 2 months to 2 weeks, and lowers the SLA fault rate by 38%.

Telecom Review attended the exclusive media roundtable following the launch event. Here, Yang has mentioned that technology innovation and customer needs are the key factors that has driven Huawei's impressive data center footprint in the UAE. He cited the largest solar-powered data center in the Middle East and Africa (MEA) region as a testament to this. Due to the abundant

solar energy present in this location, a lot of local requests has resulted to Huawei utilizing AI-based cooling technology, achieving a PuE of 1.3 during the scorching summer heat that can reach up to 70°C.

Huawei reportedly holds over 70% of the market share of data center facility in the Middle East, and the company combines digital and power electronics technology to provide low carbon solutions that are secure, simplified, and green.

Huawei industry leaders have further emphasized that the rapid development in the data center industry will continue to result in a higher density trend. Through a reliable architecture built with a modular design, the company is suitable to respond to this domain, coupled with green and climate resources as well as AI and computing power.

Nokia Unveils New Private Wireless Solutions



Nokia introduced its new Digital Automation Cloud (DAC) Wi-Fi solution and MX Boost for private wireless that leverage the importance of wireless networks in connecting industrial assets for organizations implementing Industry 4.0 use cases and the growing adoption of private 4.9G/LTE and 5G.

Available in Q4 2022, the Nokia DAC Wi-Fi solution allows organizations to tap into a license-free spectrum to augment their private networks and support non-business-critical operational technology (OT) workflows. These organizations can now take advantage of the Nokia DAC single cloud-based operations and management interface for all connectivity technologies, add plug-and-play private wireless 4.9G/LTE and 5G for real-time

reliable connectivity, or boost capacity with Wi-Fi 6 for other connectivity needs. This not only provides unparalleled flexibility, but also significant cost efficiencies that come with single platform operations.

Stephan Litjens, Vice President of Enterprise Solutions for Nokia, said, "By introducing the Nokia DAC Wi-Fi connectivity solution to our portfolio, we broaden our support for connecting machines, sensors and people to accelerate our clients' Industry 4.0 journey. Moreover, with all data flowing into our MX Industrial Edge, we also make it easier for application developers and system integrators to create intelligent solutions as they can process that data in real time on our open compute platform. With Nokia DAC Wi-Fi, we place connectivity choice firmly in the hands of our customers and offer a solution that best meets their digital transformation needs today and tomorrow."

In parallel with this, MX Boost for private wireless functions at the IP layer and

combines disparate radio technologies and spectrum to achieve the best possible reliability and performance for demanding Industry 4.0 use cases. Using MX Boost, organizations can aggregate Wi-Fi and 4.9G/LTE to optimize throughput and improve determinism, which is the ability of the network to guarantee performance, even in challenging radio conditions for real-time applications.

"As a leader in private wireless, we want to deliver the most innovative solutions to meet the connectivity needs of all our customers. The capabilities of private 4.9G/LTE and 5G allow them to support demanding applications, and in many cases, deployments leveraging multiple layers and frequency bands. Nokia MX Boost can aggregate and integrate those layers to supercharge performance and reliability. It operates over any Wi-Fi network, as well as with the new Nokia DAC Wi-Fi, to allow companies the greatest choice in the way they support their digital transformation," added Litjens.

CommScope publishes Q1 financial results



CommScope Holding Company, Inc., a global leader in network connectivity solutions, reported results for the quarter ended March 31, 2022.

Net sales in the first quarter of 2022 increased 7.6% year-over-year to \$2.23 billion. Core net sales increased 10.3% year-over-year primarily due to higher net sales in the connectivity and cable solutions and outdoor wireless networks segments.

Net loss of \$(139.9) million, or \$(0.75) per share, in the first quarter of 2022, increased 43.3% compared to the prior year period's net loss of \$(97.6) million, or \$(0.55) per share. Non-GAAP adjusted net income for the first quarter of 2022 was \$64.4 million, or

\$0.26 per share, versus \$88.3 million, or \$0.36 per share, in the first quarter of 2021.

Non-GAAP adjusted EBITDA decreased 12.6% to \$253.3 million in the first quarter of 2022 compared to the same period last year. Non-GAAP adjusted EBITDA as a percentage of net sales decreased to 11.4% in the first quarter of 2022 compared to 14.0% in the same prior year period. Core segment adjusted EBITDA decreased 14.9% to \$230.0 million in the first quarter of 2022 compared to the same prior year period. Core segment adjusted EBITDA as a percentage of net sales decreased to 13.3% in the first quarter of 2022 compared to 17.2% in the same prior year period.

"I am pleased to share that we delivered Core net sales of \$1.73 billion and Core adjusted EBITDA of \$230 million for the first quarter of 2022. We are encouraged by the strong top-line performance delivered by Core CommScope, growing net sales 10% from the prior year. While margins remained under pressure during the

quarter, our CommScope team remains focused on the pricing initiatives that are underway to recover inflation, and we expect to see margin improvement for the Core portfolio in the second half of the year. Our growth is a testament to the solid demand we continue to see in many of our end markets and our dedication to advancing CommScope NEXT to strengthen our business," Chuck Treadway, President and Chief Executive Officer, stated.

Treadway added, "Through the transformational initiatives of CommScope NEXT, we are committed to unlocking additional capacity for connectivity and cabling to fuel organic growth. In addition, we are driving growth through our investments in innovative products such as our NOVUX™ product line of fiber connectivity, our next-generation XGS-PON suite, MOSAIC™, ONECELL®, and DOCSIS® 4.0. As we continue to execute our strategy, we are enabling greater efficiency through our general management structure and new segment alignment to drive value for shareholders.

Ericsson's New Platform to Accelerate 4G, 5G Solutions For Utilities



Ericsson has announced the opening of its Global Utilities Innovation Center at its facility in Plano, Texas. The new fully functional facility consists of a purpose-built operating lab and demo environment locations that will allow utilities to engage with Ericsson and its partners to solve real-world connectivity challenges.

"Private cellular networks are principal catalysts for utilities in their digital transformation journey to address multiple use cases, and utilities can

now leverage our Global Utilities Innovation Center to experiment with different 4G and 5G use cases and co-create with our ecosystem partners," says Koustuv Ghoshal, Vice President and Head of Utilities, Energy & Industrials at Ericsson North America. "We look forward to partnering with utilities around the world on their grid modernization journey."

The Global Utilities Innovation Center is integrated with Ericsson's state-of-the-art device testing lab a short distance from the Plano site, where utilities and Original Equipment Manufacturers (OEM) partners can test interoperability of their field and IoT devices over mission-critical networks in a safe and secure environment. As a fully functional end-to-end operational lab, the center contains a physical

representation of a utility smart grid, enabling real-world demonstrations of end-to-end private networks operations across the power grid from generation and transmission to distribution to end users.

"Utilities require mission-critical networks that have to be secure, reliable, and increasingly sustainable," says Per Wahlen, Head of Business Development at Ericsson North America. "This center is a state-of-the-art facility where we can work closely with utility companies, exploring new 4G and 5G use cases and delivering end-to-end solutions. At each point, you can see the benefits of the latest generations of cellular wireless networks in enhancing security, resilience, and efficiency of the power infrastructure."



Telcos Bringing the Next Stage of Evolution

“We see transformation as primarily a technology challenge or a new digital service opportunity or a cultural change or a customer engagement issue. Transformation is all of the above, and more,” says Martin Creaner, author, digital transformation and corporate strategy advisor.

Digital transformation has been a focus by all the telecom majors for some time now, but 2022 is truly starting to show some transformational activities. A big transformational push is required for telcos particularly

in areas such as cloud- and edge-native technology, coupled with far higher levels of automation and better customer offerings; all of which must be supported by solid data foundations.

This is where digital transformation comes in. To deal with shifting customer demands and tap into new business opportunities, telecom

companies need to change how they operate and shed substantial amounts of technical debt.

Over the course of the past few decades, telecommunications companies have shaped a flourishing environment where digitally native companies can grow and provide services to billions of consumers as they also facilitated the digitalization of countless industries.

Recently, large telcos are integrating technological advancements at scale, providing superior online services and products and working hard to transform the customer experience.

What is telecom transformation?

Telecom transformation is an industry term that describes the move from traditional network services toward more user-friendly, dynamic and service-focused business and operating models in telecommunications. This transformation is driven by mounting infrastructure and maintenance costs, a decline in traditional service use (such as SMS or voice calls) as well as changing consumer expectations. Telcos will also have to rethink their internal structures to level this kind of change and sometimes need to overhaul their internal processes.

Many telecommunications companies have already adopted agile strategies for at least some parts of their operations. Telecom giant Airtel has recently announced overhauling its existing ERP Financial and SCM processes to upgrade them with the power of AI/ML.

Moreover, MTN Group unveiled an evolved visual identity with a new logo that highlights MTN's commitment to continuously evolve and explore innovative initiatives that provide value to all their stakeholders. The new brand identity is modern, simple, bold, and digitally dynamic. It kicks off with a provocative and simple question, “What are we doing today?”. With a clear and concise brand strategy that Opportunity + Energy = Progress, MTN understands that to truly unlock the full benefits and potential of the digital world, people require a combination of drive,

progressive thinking, and the right tools to drive progress further through action and doing.

As for Etisalat Group, “e&” has marked the transformation ambitions of the Group into becoming a global technology and investment conglomerate. The transformation of e& from a telecom company founded more than four decades ago in the UAE into a global influence in digitalisation highlights its role in upholding the UAE’s sustainable economic development and diversification plans.

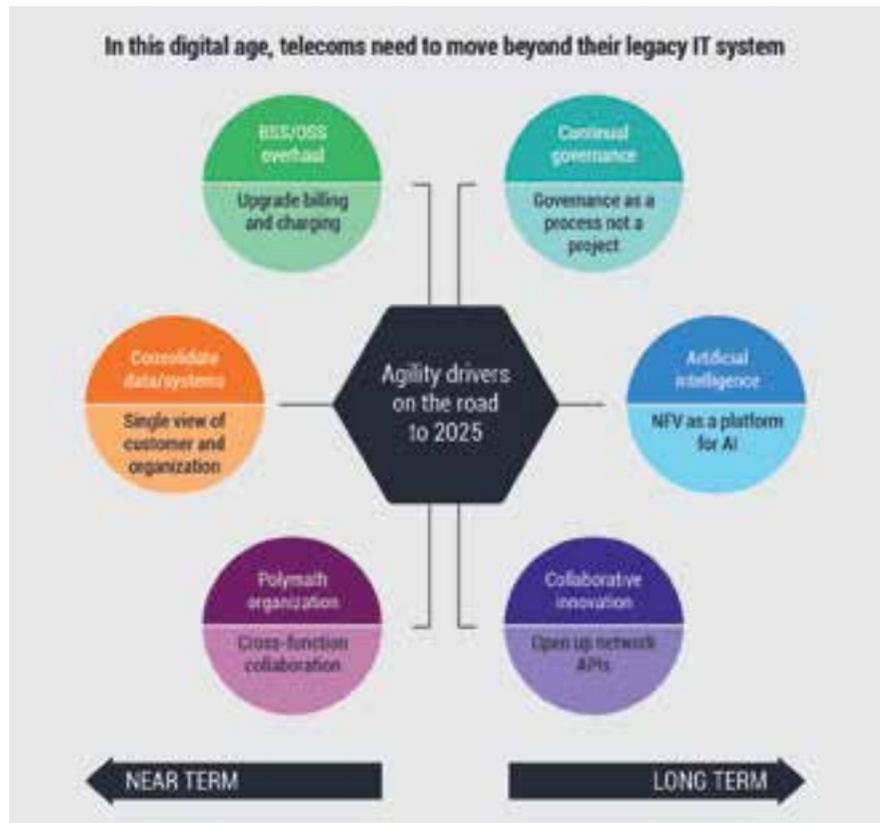
Challenges to overcome

It is challenging for telecom companies to provide quicker and more agile services as their business becomes more complex. Some of the challenges are:

- **Market integration:** Previously, services such as fixed-line, broadband, and broadcasting were separate markets. Consolidating these services increases complexity for the telecom service provider. This will get even more challenging as more services such as smart cars and smart homes become common.
- **OTT services:** The increasing demand for over-the-top (OTT) platforms, such as Netflix and Disney Plus, has forced telecom companies to incorporate a more flexible business model, work with new operators, and allocate revenue to new alliances. The seamless integration of these elements in the existing model can be challenging for telecom service providers.
- **Centralized to decentralized:** Many new digital technologies are based on agile development. Therefore, if a telecom company has a centralized system, it can be challenging to decentralize these systems in order to implement these digital solutions in different parts of their business.

How to remain competitive

Telecommunication companies will need to incorporate in their business systems a few elements to become more agile and remain competitive in the market. The figure below shows how telcos need to move beyond their legacy IT systems.



Source: EY

Vendors are here to help

The digital transformation is extremely crucial for CSPs to take advantage of the new emerging business opportunities. The maturing digital ecosystem means that the subscribers and businesses are no longer satisfied with basic services. They want to feel privileged through personalized interactions, quick resolutions to problems and product and service recommendations based on their preferences and requirements. One can say that loyalty is no longer based on the product or brand. Instead, it is the result of a consistently superior experience across all touchpoints.

Huawei defines this evolving customer experience as PEAKS Experience. It includes five features including targeted precise product and marketing (Know Me), convenient digital applications and convergent ecosystem (Make it Easy), Seamless experience on clouds and networks (Seamless X), assured network and data safety (Protect Me) and lastly, ecosystem value creation (Add

Value). A service provider then needs to quickly make changes across product, marketing, channel, service and relationship maintenance. Furthermore, these areas need to be seamlessly integrated to deliver the desired results.

This kind of customer experience is possible only if the service provider has digitally transformed its infrastructure across digital experience, operations processes and ecosystems partner journeys.

To wrap up, we live in a technology-dependent, highly-digitalized environment where telecommunications companies are experiencing mounting pressure to transform their businesses. The need for change is urgent and for many telcos, this journey is already underway. It involves implementing changes to the systems, processes, data-management, skills and culture across the telco, to ultimately align customer engagement experience with the best-in-class across all other consumer verticals. **TR**



New Access Mode: Mobile and Cloud

The new normal setup of the pandemic has made access control an important aspect to understand, integrate, and improve. Having said that, mobile technology and technological advancements in cloud computing have driven innovation in switching from manual access control to electronic and cloud-based ones.

Smartphones have proven to be vital portable two-way communications device that allows users to connect and collaborate with other devices and networks with ease. The global mobile workforce is expected to reach almost 2 billion by 2022, making mobile access control one of the emerging trends for access management.

Unlocking the workplace, home, car, hotel room, or any other access points has now embraced digital technology, empowered by modern ICT like 5G, AI, big data, and advanced encryption and security standards. Remotely managing an access control infrastructure is also being done in a more flexible, secure, and convenient manner via the cloud.

Mobile technology is pervasive and growing, and this will continue as the world becomes more mobile-centric than before. This would contribute to the demand for keyless and contactless systems wherein mobile access with smart devices and cloud-based access solutions are ideal.

The billion-dollar access control market would continue to thrive and innovate further to keep individuals' and enterprises' information secured and enhance the productivity and efficiency of their day-to-day workload and operations.

Mobile Access Control

Mobile is bound to be adopted to replace traditional keys and time-consuming usernames and passwords for access. Mobile devices are gradually being used to open doors, manage access rights, and even handle properties for retail, corporate, school, residential, hotels, etc.

Unmanned stores and keyless entrances can now be accessed swiftly by scanning a code or digital ID on your mobile. Without a doubt, mobile access promises convenience, advanced security, and flexibility with the added benefits of enhanced touchless experiences and broader read ranges.

A survey by HID Global estimated that more than half of businesses have

upgraded or will upgrade to a mobile access control system in the next three years. IHS Markit has also reported that mobile-based credentials are the fastest-growing access control product, with more than 120 million mobile credentials forecasted to be downloaded within 2023.

Nowadays, mobile is being delivered in a way that hadn't been done before from an access perspective, coupled with cloud technology. In an era where less contact is better, mobile access credential is very useful. It also eliminates the time and costs needed in case of any lost or stolen key cards.

Paired with biometric identification and multi-factor authentication, mobile access control can be more protected. And, typically, once transmitted to the reader, another encryption layer is used to secure the transmission of the information payload to the reader.

Smartphones can also serve security purposes beyond access control such as sending mass/targeted notifications, presence detection, virtual buttons, and applications. Industry integrators are asking more about mobile access, with its adoption continuing to rise, especially within hybrid setups.

Cloud-Based Access Control

Alongside mobile, cloud-based access solutions are also escalating. There will be fewer people sitting on-site to administer access control settings as being physically present is not needed anymore to let contractors or vendors in or open a facility as required. Digital keys would become more common, which creates an easier tracking system on who has what key and for which doors, building more accountability among people.

Mobile access control systems work hand-in-hand with the cloud to address flexibility and cost issues. Through the cloud, managing the servers that the system is hosted on can simply be left to cloud access control providers who manage the entire service for you – aka SaaS. Resulting in higher uptime and increased reliability, proven cloud solutions also eliminate the hassle,

cost, and complexity of a traditional access and security system.

Moreover, cloud-based access control adds an extra layer of security, thanks to its ability to function without connection autonomously, run regular updates and backups, as well as streamlined operations. With automated system updates and integration, cloud-based access control empowers facility managers or system owners to be less vulnerable and smarter in handling risks.

Indeed, access control is shifting to mobile and cloud-based solutions, but the merging of physical and logical access control systems still faces many challenges that hinder a truly digital infrastructure experience.

It is true that companies can't make the switch to new technologies overnight, but neither can they afford to rely for too long on aging, vulnerable technology while planning a transition.

Responding to this, as an enabling technology for mobile access, cloud connectivity can improve the on-demand availability of software and data. To illustrate, with cloud-based access control, organizations can expand access with edge-controlled doors and smartphone apps for user access.

Additionally, through cloud-based solutions, users can easily access systems and data from virtually any location, including the ability to leverage mobile apps; extensibility without much investment in technology; and quick installations.

For vertical markets that can deploy mobile access and cloud-based access control, such deployments reduce hardware and network dependencies on-prem and present opportunities to manage access remotely as well as deploy access at the edge or distributed locations.

As the pace of innovation accelerates, cloud-based access control can be leveraged for scalability, real-time and remote grant or revocation of access, fast evolution, constant data backups, and secured storage of data. **TR**

Tampnet Boosts Capacity of Europe's Fastest Inflight Broadband Solution

Tampnet has collaborated with Deutsche Telekom and Inmarsat in boosting the capacity of their award-winning European Aviation Network (EAN) inflight broadband solution.

Elie Hanna, CEO of Tampnet said, "Our extensive offshore network was the perfect fit for the EAN project. Installing and maintaining an LTE network offshore is very challenging and we were honored to have the opportunity to extend our expertise and engage in such an innovative and significant project for Europe and the aviation industry."

In total, the cooperation entails eight further antenna sites that complement the already 300-strong LTE-based ground network component — five sites will be on production platforms in the North Sea, benefiting from Tampnet's extensive fiber network in the area; two are being placed in offshore wind farms within Germany's and the Netherlands' coastal waters (exclusive economic zones); and one more is already operational onshore in Norway.

"The fact that the network is fully supported by our subsea network ensures its scalability for future capacity needs," Hanna added.

The new sites are located strategically to further enhance EAN's high-speed passenger connectivity on flights in Northern Europe, including high-density flight routes between the UK, the Netherlands, Denmark, and Norway.

MEF establishes technology advisory board

Senior executives from Blue Planet, Cisco, Fortinet, Netcracker, Salesforce, ServiceNow, Spirent, Versa Networks, and VMware are tapped to bring critical technology perspectives to MEF.

The MEF technology advisory board (TAB) augments the leadership and expertise of MEF's world-class board of directors and brings important technology provider perspectives to the strategic work of MEF.

MEF established the TAB to incorporate input from all key stakeholder communities—cloud, network, and technology providers—with a goal of helping the ecosystem more quickly develop and bring to market leading-edge services and solutions. TAB members will serve a one-year term and were selected for their extensive industry leadership in MEF's strategic areas—cybersecurity, business automation, SD-WAN, underlay connectivity, and edge computing. The TAB initially will focus on increasing efficiencies and opportunities within the member ecosystem and supply chain more quickly to generate revenue.

The technology advisory board consists of ten industry luminaries:

- Kelly Ahuja, chief executive officer, Versa Networks
- Kailem Anderson, vice president of portfolio and engineering, Blue Planet
- Ari Banerjee, senior vice president strategy, Netcracker
- Rohit Batra, vice president and head of product, telecommunications, media & technology, ServiceNow
- Craig Connors, vice president and general manager, SASE Business, VMware
- David Fan, vice president and general manager, communications industry, Salesforce
- Sunil Khandekar, former founder & CEO of Nuage Networks, Independent
- Dave Larson, chief technology officer and general manager, Cloud & IP, Spirent
- John Maddison, executive vice president of products and chief marketing officer, Fortinet
- JL Valente, vice president, product management, enterprise routing and SD-WAN, Cisco.

Singtel Partners Micron for Commercial 5G mmWave Solution

Singtel has been appointed by Micron Technology to deploy its 5G millimetre wave solutions with localised edge core at the semiconductor manufacturer's 3D NAND flash memory fabrication plant in Singapore. Micron is the first company in Singapore piloting 5G by deploying an mmWave campus solution with edge core on-premises for industry 4.0 manufacturing applications.

The customised solutions will be deployed at Micron's cleanroom to support the development of a variety of digitally enabled and enhanced applications — from automated visual inspections of individual chips to augmented reality (AR) for operations

and maintenance. This rollout follows successful trials using Singtel's GENIE, the world's first portable 5G-in-a-box platform, which helped validate the mmWave solution, verify its performance and demonstrate the operational benefits of Singtel's 5G solutions in Micron's next generation cleanroom.

Singtel's 5G mmWave network supports massive bandwidth of up to 2 Gbps with ultra-low latency — bringing to life a whole suite of applications from high resolution and immersive AR/VR glasses, to the confidence needed to conduct image-based quality control processing which demands high uplink bandwidth.

SES and Vodafone PNG Partner for 4G and 5G Services via Satellite to Papua New Guinea

SES and Digitec Communications Limited (Vodafone PNG) have partnered up to provide 4G and 5G high-speed mobile broadband services to Papua New Guinea. The reliable high-speed data service will be delivered via SES's O3b medium earth orbit (MEO) satellite constellation, which will further enable economic opportunities and bridge the digital divide in the world's second-largest island. Under this partnership, the O3b MEO satellite constellation will provide Digitec with high-speed mobile backhaul services for 5 locations in PNG.

With over 86% of its population residing in rural areas, much of PNG's population is still underserved despite an increase in internet penetration across the country at 15% and mobile connections at 34% as of January 2021. Having started services in April, Vodafone is the third largest and newest mobile operator in PNG. Its

entry into PNG's telecommunications market addresses the demand among consumers and businesses for reliable high-speed connectivity and broadband Internet access.

The connectivity that the O3b MEO satellite constellation brings is not new to PNG as it has been used by other mobile operators and internet service providers in the country since 2014. During the APEC 2018 summit, it also helped with connectivity needs when PNG hosted this event. SES's O3b system is the world's only commercially successful non-geostationary satellite system and delivers low-latency, high-performance connectivity worldwide. The fibre-like speeds enable the delivery of cloud computing applications and services to bridge the digital divide, while connecting communities and industries regardless of the remoteness of the location.

MYCOM OSI Embarks Next Innovative Chapter With Amdocs

For approximately \$188 million, Amdocs has entered into a definitive agreement to acquire MYCOM OSI. Expected to be completed in the fourth quarter of fiscal 2022, the acquisition will expand Amdocs' network portfolio to include end-to-end service and network orchestration by bringing key assurance capabilities to power the next generation of networks. MYCOM OSI's award-winning service assurance suite comprises performance management, fault management, and service quality management, leveraging artificial intelligence (AI) and machine learning (ML) to detect and predict anomalies and enable intent-driven closed-loop operations through automated remediation and AIOps.

MYCOM OSI delivers 5G assurance applications and solutions to multiple customers with 5G networks, as well as serving wireline operator networks, which

are becoming increasingly virtualized, containerized, and software-defined. MYCOM OSI's cloud-native solutions leverage the benefits of the cloud such as scalability, cost, and reliability, and support the converged network-cloud ecosystem.

"This is a strategic growth move that builds on our other recent successful acquisitions in the network and cloud space and executes on three of our core strategic pillars – intelligent network automation, 5G, and cloud," said Shuky Sheffer, President and CEO at Amdocs. "As the network and services of the 5G era become increasingly dynamic and complex, a holistic, end-to-end approach is key and can only be achieved with a powerful AI-backed assurance solution suite. That's why we're so excited to welcome the highly talented and dedicated MYCOM OSI team to Amdocs."

Safaricom Plans on Launching Operations in Ethiopia This Year

Safaricom is planning to begin its commercial operations in Ethiopia by the end of 2022, pledging to launch the new network by then. Since May 2021, when the Safaricom-led consortium won a license to operate in Ethiopia, it has been looking to expand into the horn of Africa nation.

Peter Ndegwa, CEO of Safaricom, commented on this matter during the announcement of the company's full-year results for the year ended March 2022. "We have made significant progress towards a commercial launch. We are engaging with the Ethiopian Communications Authority and other relevant partners about the requirements for ensuring a commercial launch this year."

Ethiopia is Africa's second-most populous country and provides a huge opportunity for expanding telecom services. Safaricom Ethiopia was expected to launch in April 2022, but it appears the telco needs more time to prepare. According to Ndegwa, Safaricom plans to offer mobile financial services to Ethiopia, including the hugely popular M-Pesa mobile money system.

Ethio Telecom is part of a broader plan to privatize public enterprises by the Ethiopian government, which aims to sell 40% of the company. The process was halted in March 2022 because of economic challenges both locally and internationally. Ethio Telecom announced it had launched 5G in the capital, with plans to expand the footprint to regional cities over the next year.

NTT Opens First Data Center in Spain

NTT is massively expanding its data center capacities worldwide and has now opened its first data center location in the Spanish market.

The high-availability, Tier 3-compliant colocation data center is located on NTT's Európolis Business and Technology Park site 20km northwest of Madrid. It provides hyperscalers as well as enterprise clients with 3,600m² of IT space and a maximum IT capacity of 6.3MW when fully built out.

"The demand for data center capacity in Spain has grown strongly in recent years. Madrid is the largest data center hub in Spain and a European gateway to the world, and our investment in the region is another milestone on our global roadmap as we continue to expand our presence across the continent to meet the coverage, capacity, and connectivity needs of our clients," said Florian Winkler, CEO of NTT Ltd.'s Global Data Centers division in EMEA.

Putting a highly available, secure, and sustainable infrastructure as a priority, at the Madrid site, the entire cooling concept of the data center was adapted to the warm climate of central Spain: air-cooled chillers and higher cooling water temperatures reduce power consumption and ensure efficient operation of the facility.

In fact, NTT's first major client installation in the facility is powered entirely by renewable energy.

Companies will benefit from excellent connectivity as NTT's proprietary Global Data Center Interconnect (GDCI) network structure makes it easy and fast to implement high-performance private connections to internet nodes such as ESpanix, NetIX, and DE-CIX, as well as cloud providers like AWS, Google, Microsoft, and others.

MTN SA and IHS Towers Sign an Acquisition and Lease Back Agreement

IHS Holding Limited, one of the largest independent owners, operators, and developers of shared communications infrastructure in the world by tower count has completed the acquisition of 5,701 towers in South Africa from Mobile Telephone Networks Proprietary Limited (MTN), one of the leading mobile telecommunications operators in South Africa. Under the agreement, IHS Towers is also providing power management services to MTN SA on approximately 13,000 sites, including the acquisition portfolio, across South Africa.

Cash consideration for the Transaction is ZAR6.4 billion. The acquired assets as well as the provision of power management services across MTN SA's portfolio are expected to deliver revenue and adjusted EBITDA of approximately US\$192 million and US\$85 million, respectively, in the first

full year of operations. This transaction has received the necessary regulatory approval from the South African competition commission.

The power management services component of the transaction is aligned to IHS Towers' existing service offering in other African markets – this service will be delivered to the acquired sites, as well as to other third-party sites on which MTN SA is present. This service will primarily involve power systems and security at sites. IHS Towers will own 70% of the South African Towers business with the remaining 30% to be owned by a B-BBEE consortium.

With this acquisition, IHS now has an operational footprint in eleven emerging markets with seven in Africa, in addition to four in Latin America and the Middle East, with a global tower count of nearly 39,000 towers.

India's Public Cloud Services Market To Grow At 24% CAGR

The revenue for Indian public cloud services (PCS) market, including infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) solutions, and software-as-a-service (SaaS), totaled \$4.6 billion for 2021. The overall Indian public cloud services market is expected to reach \$13.5 billion by 2026, growing at a CAGR of 24% for 2021 to 2026.

"With digital innovation leading the top business objectives for Indian organizations, cloud adoption is set to accelerate in 2022. Driven by the need for agility, flexibility, and faster access to digital technologies, cloud continues to gain momentum across segments. Additionally, the need to leverage data intelligently, is supreme and enterprises are able to do so with access to technologies that are built on a cloud foundation," says Rishu Sharma, Associate Research Director, Cloud and Artificial Intelligence, IDC India.

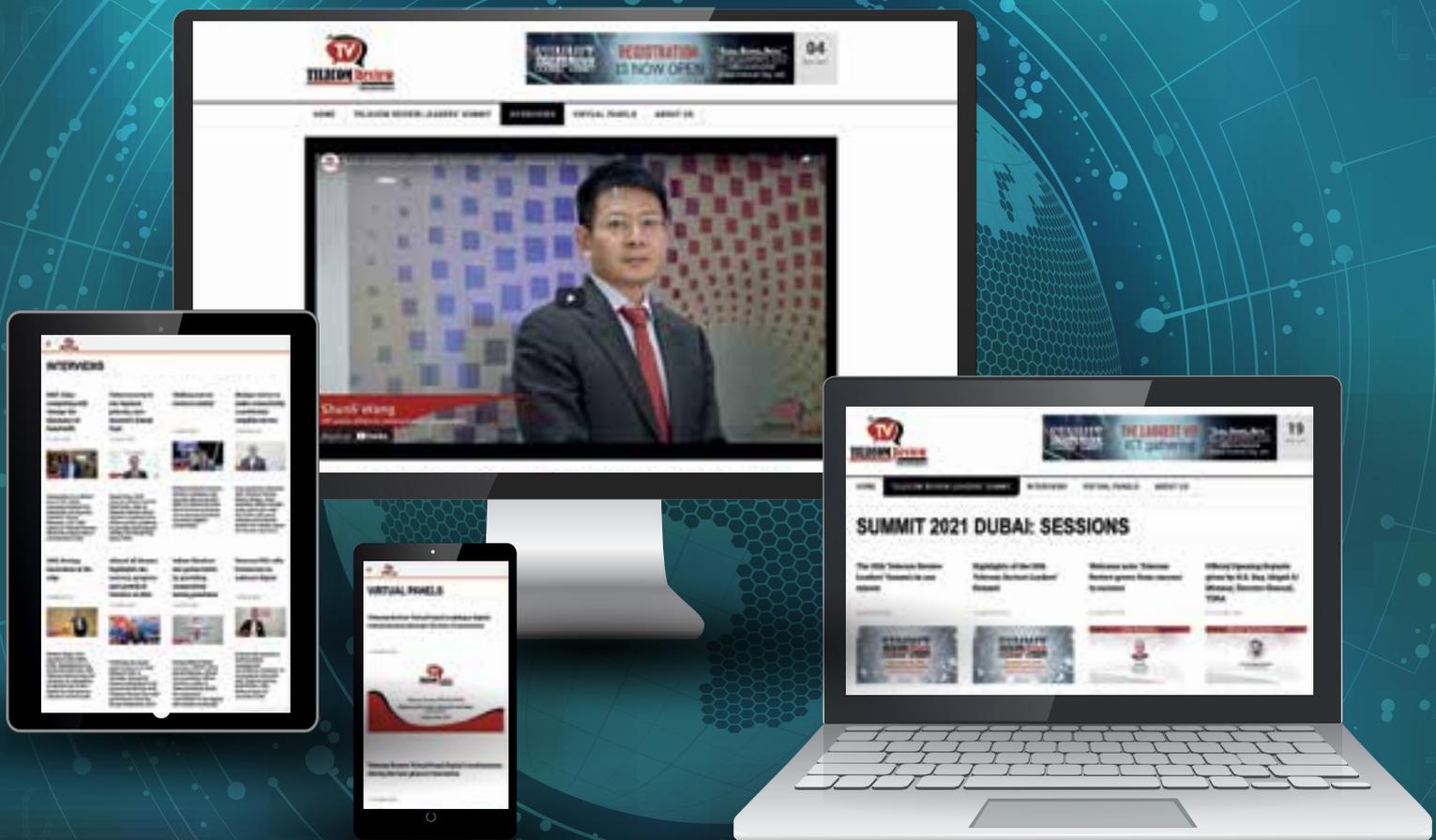
SaaS continued to be the largest component of the overall public cloud

services market, followed by IaaS and PaaS in 2021. Public cloud spending continued to increase among enterprises, with the top two service providers holding more than 45% of the Indian public cloud services market.

India continues to be among the fastest-growing market for public cloud service providers due to the robust demand from large enterprises, digital natives, and also from small and medium businesses in the country. In 2021, enterprises continued to invest in public cloud to ensure business continuity, improve resilience and productivity, and drive digital innovation. There has been an increased demand for cloud-based security applications as organizations expect part of their hybrid workforce to return to offices in 2022. Apart from migrating existing workloads to the public cloud, there is also an increased demand for cloud-native application development after the pandemic, driven by the need to bring ideas faster to the market and address customer demands.

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IPv6 Enhanced Online Summit

For the third consecutive year, and following the success of the first two editions, Telecom Review is organizing the IPv6 Enhanced online summit entitled IPv6 Enhanced: Inspiring Innovation, Boosting Middle East Digitalization.

Place: Online



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JUNE

NGMN Industry Conference & Exhibition

The IC&E is a highly recognized bi-annual global industry event, where CTO/CTIOs and other top management level participants share their perspectives on today's and tomorrow's opportunities and challenges of mobile communication.

Place: Paris, France

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SEPTEMBER

GITEX x Global DevSlam

GITEX GLOBAL is one of the world's most influential meeting places for the technology industry; bringing together thought-leaders, creators, innovators and makers to discuss, debate and challenge new ideology, showcase new products and identify future opportunities.

Place: Dubai World Trade Center, UAE

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OCTOBER

Telecom Review Leaders' Summit 2022

The 16th edition of the leading ICT gathering will be held in a hybrid format where the latest industry trends will be tackled.

Place: Intercontinental Dubai Festival City, UAE

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DECEMBER

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