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Is sustainability there?

We are all talking about digital transformation, digital economy, wireless living, smart living, and creating mega datacenters which require a lot of power and energy. Sustainability and green commitments have become an important part of CSR strategies.

Carbon neutrality has become a globally recognized mission, one to which the ICT industry is actively contributing. Leading vendors should take that into consideration throughout their innovation chain.

These days, advancements in ICT are focusing more on using less energy to transmit, process, and store more information, while making energy systems more efficient.

As per experts, the 5G's energy consumption is only 1/10 compared to 4G's and it can provide 30 times the capacity. This example illustrates a significant improvement. Digital technology can also support renewable and clean electricity generation, while also optimizing energy supply and demand models.

According to the Global Enabling Sustainability Initiative (GeSI), ICT has the potential to enable a 20% reduction of global CO2 emissions by 2030.

All ICT stakeholders are urged to make sustainability an objective to protect the environment and lower the OPEX of companies, mainly datacenters which consume power intensively.

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virtual panels

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Börje Ekholm, President and CEO, Ericsson

Ericsson drives further innovation and empowerment in Saudi Arabia

Telecom Review had the opportunity to conduct exclusive interviews with Ericsson's top C-level executives as well as the leaders of EricssonMiddle East and Africa (MEA).

Börje Ekholm, President and CEO of Ericsson, Fadi Pharaon, President of Ericsson Middle East and Africa (MEA), and Mathias Johansson, Vice President and Head of Ericsson Saudi Arabia and Egypt, Ericsson MEA shared Ericsson's vision of the future and what they consider key for progress, Ericsson's presence in the Kingdom of Saudi Arabia, and the essence behind empowering local female talents, among other interesting insights. Additionally, Fadhel Issa, Head of Networks for Customer Unit at Ericsson MEA imparted about smart factories' innovation in the Industry 4.0 era.

Ericsson exhibited strong performance in 2021. To what do

you owe this success and how would Ericsson continue this path in 2022?
Börje: We did a couple of changes in 2017 where we increased our commitment and decided to lead on technology, thus developing the best, most cost efficient solutions. Of course, that is contributing to the success in 2021 and I'm convinced those two factors will contribute to the success in 2022 as well.

5G transforms all aspects of society today. How does this help achieve Ericsson's new vision and purpose of creating connections that make the unimaginable possible?
Börje: We should think of the digital infrastructure as a national critical infrastructure. We often think of it as a means allowing us to communicate. However, I think it offers a much more fundamental change, because it will allow our society to digitalize.

Consumers are indeed presenting high interest in digital. Even governments are digitalizing. Digital infrastructure will change the way we work, live, and function. So, we should expect to see profound changes.

How does the company plan to foster more conversations and partnerships to realize its 2030 vision?
Börje: It is critical to understand that in the new world it's not about one's self only. Today, we're seeing technologies becoming horizontal. The network, for example, is a horizontal platform. In a horizontalized world, I think we're going to need to see more partnerships. So, it is crucial to plan how to work in an ecosystem, how to work with our operating customers as partners, how to work with universities as partners, and how to work with other companies, even be competitors, as partners. So, in our opinion, the future is going to be much more about ecosystems.

In the end of last year, we announced our intent to acquire Vonage, which is a new way to transform business horizontally. What is interesting is that we can thereby start orchestrating the 5G APIs and really expose them to a developer.

That is the way we think the world is shaping and that is how we need to interact with the Vision 2030: To start forming those partnerships and ecosystems that can help realize the Vision 2030. We will only do that by actually providing our part of expertise before somebody else contributes with their part in that ecosystem.

The Middle East is one of the most significant operating markets of Ericsson. How does your participation in LEAP 2022 reflect this position?
Börje: I stress again the importance of the ecosystem as a critical pillar for the future. So participating at this event is actually very important as an initiative to form those new types of partnerships. That is why we have engaged here and it's one of our major engagements. We want it to be significant because we think that it is going to shape an ecosystem.

Telecom is an essential and dynamic industry. How does a global ICT leader like Ericsson intend to respond to the ever-changing demands across verticals?
Börje: We are providing the horizontal infrastructure for the world and for 5G. We believe that when we talk about the future, connectivity is a bit taken for granted. We give a lot of importance to technologies - AI for example - but we forget that all of them depend on a connectivity that is secure, reliable, and always available. That is the purpose of the 5G infrastructure. So, by focusing on our position in the ecosystem, we can actually help each vertical to succeed.

Moving forward, how do you see Ericsson, under your leadership, progress further in terms of corporate growth and customer-driven innovation?
Börje: We want to be technology leaders in mobile infrastructure. But then, what we need to do is ensure that we allow innovation to happen. For that, we are interacting with universities through our 'Ericsson Innovation Awards' where we invite students from around the world to innovate on top of connectivity to solve some really big problems. In addition, we are engaging with startup companies and innovation hubs, like here in Riyadh, where you can allow startups, entrepreneurs to innovate on top of the 5G infrastructure. Plus, we are launching different types of initiatives around the world such as hackathons, in a bid to leverage the infrastructure to create new applications.

We need to expose our infrastructure to entrepreneurs and in return, they are going to create the new applications.

What is Ericsson's main focus in the R&D?
Börje: Our main focus is on the mobile infrastructure and we are almost entirely geared up. We spend a little over $4 billion annually on R&D mainly and we have about a quarter of our people working in R&D today.

> What we need to do is ensure that we allow innovation to happen

Fadi Pharaon, President of Ericsson Middle East and Africa (MEA)

ICT holds a key role in enabling Saudi Vision 2030
Fadi Pharaon highlighted how the ongoing tech innovation in the Kingdom impacts the region as a whole.

What makes LEAP an ideal stage to showcase Ericsson's innovation?
Fadi: We are super honored to be here at LEAP. We committed to it by having an active participation via both a physical booth as well as our thought leadership speeches on the event's stage including a speech by our Group CEO and president who physically joined the event. We look at it in the context of the Kingdom of Saudi Arabia's Vision 2030 and everything that they want to achieve in the years to come.

We see that ICT holds a very important role in order to do so. Coming here to the LEAP exhibition and conference gives a chance to all of us working in the ICT ecosystem to showcase and identify all of the opportunities and the challenges of consumers, industries, and enterprises and demonstrates how ICT can actually alleviate that.

It gives us an opportunity in our booth here to show multiple demos and ongoing use cases from around the world and how we can contribute to the customers within the Saudi market.

Having said that, which verticals or solutions would be leveraged by Ericsson, specifically within KSA?
Fadi: This is exactly what we are discussing with our customers. For example, we're examining how to take the next steps to monetize 5G, which has been up and running in Saudi for three years already. We're ready because of a lot of interest to engage with enterprises in the industrial world.

Moreover, we have different use cases, ranging from verticals like mining, manufacturing plants, and healthcare. We are working on trying to bring in all these use cases on the ground and see how we can deploy them and how we can scale that from here.

As a leading 5G transformation partner, how will 5G deployment be accelerated in the MEA region?
Fadi: We have multiple facets of 5G. One is the radio part, the other part is the core on the cloud. I would say in the Gulf nations, 5G is really in the top league globally, in terms of deployment. We see also very progressive regulation across the region, where they're providing more spectrum so that the operators can have even bigger bandwidth offered through 5G. Hence, we believe that it's definitely a very exciting journey together in this market.

In your perspective, how will the telecom industry as a whole evolve within the Kingdom and how will this impact the whole region?
Fadi: There's a realization here to bring a lot of knowledge and really build a knowledge-based economy, which will utilize ICT as a way to bring the Kingdom forward towards its visions. We see that there's a lot of collaboration right now in this ecosystem to bring talents. We are also investing in talent as we bring in graduates for instance in the Ericsson operations here in Saudi Arabia. We have also actually concluded a memorandum of understanding (MoU) with King Abdullah University of Science and Technology (KAUST) where we will conduct research together in the realm of 6G.

Those are examples of how we can collaborate in the Kingdom to ensure that we have what it requires — the talent, the solutions, and execution powers to make the Kingdom take a global lead in terms of deployment of new technology.

> “In the Gulf nations, 5G is really in the top league globally, in terms of deployment”

Mathias Johansson, Vice President and Head of Ericsson Saudi Arabia and Egypt, Ericsson MEA

Ericsson empowers women in KSA

Since 2017, the number of female hires in Ericsson KSA has been on the rise. Mathias Johansson enlightened us on the significance and reason behind this initiative.

What is the essence behind Ericsson empowering local female talents in KSA?

Mathias: The principles of diversity and inclusion, which we hold dearly, are the essence of our efforts towards women empowerment in the Kingdom. With the development of local female talent being essential in Saudi Arabia's journey towards realizing Vision 2030, we have focused on driving local innovation and developing talent competencies through programs and initiatives in the Kingdom, such as our 5G Innovation Hub. As we head towards the realization of Vision 2030, Ericsson is working towards empowering more Saudi women in the field of science, technology, engineering and mathematics (STEM). As part of our graduate program, we have recently hired over 100 Saudi fresh graduates, 50 percent of which are women.

During LEAP, how did these local female talents represent Ericsson's tech innovation?

Mathias: About 18 female employees from our office in Saudi Arabia were actively present at the Ericsson booth to present our exciting live demonstrations around 5G, Internet of Senses, Artificial Intelligence (AI), and more. We are extremely proud of this and will continue our efforts to push the local women of Saudi Arabia to join the Nation's workforce. Our ambitions around women empowerment in the Kingdom have always been focused on hiring, promoting, retaining, and growing our female talent through mentorship and networking as well as providing them with adequate education and training to excel in their field. We are committed to continuing on this path and look forward to encouraging our local female talents to be bold and take on new challenges.

> Ericsson is working towards empowering more Saudi women in the fields of science, technology, engineering and mathematics

Industry 4.0: The road to smart factories

Fadhel Issa talked about how 5G in the Industry 4.0 era revolutionizes the manufacturing industry.

What do steam engines, factory assembly lines, and computers have in common?

They are all products of the first three Industrial Revolutions that shaped global economies and changed how we as a society lived, worked, and interacted with each other.

Today, as we stand at the cusp of the Fourth Industrial Revolution (4IR), technologies such as 5G will transform the next wave of automation and pave the way for Industry 4.0. Experts, in fact, suggest that the 4IR will be the most disruptive period for manufacturing since the first steam engine.

With 5G, factories can transform the way goods are produced and delivered. 5G networks offer manufacturers and telecom operators the chance to build smart factories and truly take advantage of technologies such as automation, artificial intelligence, augmented reality for troubleshooting, and the Internet of Things (IoT). The mobile 5G technology will allow for higher flexibility, lower cost, and shorter lead times for factory floor production reconfiguration, layout changes, and alterations, enabling intelligent factories to drive productivity and efficiency, while lowering carbon footprint.

Limitless opportunities

According to a report from ABI Research, deploying dedicated cellular-enabled Industry 4.0 solutions can generate an operational cost savings return of 10 to 20x over five years. In aggregate, these solutions can generate 8.5% in operational cost savings, which equates to $200 to $600 per square meter per year for a factory or industrial site.

However, economies empowering their manufacturing sector need to understand why and how they can develop the right connectivity strategies to unlock this value.

In Saudi Arabia, for instance, the National Industrial Development and Logistics Program (NIDLP) aims to transform the Kingdom into a leading industrial powerhouse and a global logistics hub - focusing on Industry 4.0 - to generate new job opportunities and enhance the Kingdom's trade balance and maximize local production.

Driven by Saudi Vision 2030 and its digital initiatives to fulfill the strategic themes of building a 'thriving economy, a vibrant society and fueling an ambitious nation', the Kingdom today is among the foremost countries with the ambition of utilizing technologies such as 5G to transform the economic and social landscape of the nation.

This is evident in the Kingdom's drive to increase technical infrastructure readiness from 50% to 100% by 2025 in industrial cities. This initiative aims to benefit more than 40 industrial cities in Saudi, containing over 7,600 factories. It offers the manufacturers opportunities to explore and adopt digitization and automation techniques and tap into new growth markets.

Furthermore, through a public-private partnership, the Kingdom has been able to collaborate on emerging technologies such as AI/MI, IoT, Edge, robotics, and many more to support the nation's robust manufacturing sector. Ericsson's 5G Innovation Hub in Riyadh, for example, was established to help the Kingdom leverage 5G cellular technology by testing new 5G-related use-cases and gain market insights on how it can positively impact Industry 4.0 alongside other growing sectors. Today, 5G is transforming industries, and together with Ericsson, businesses can pave the path toward a fully connected and optimized factory floor.

5G fueled outlook

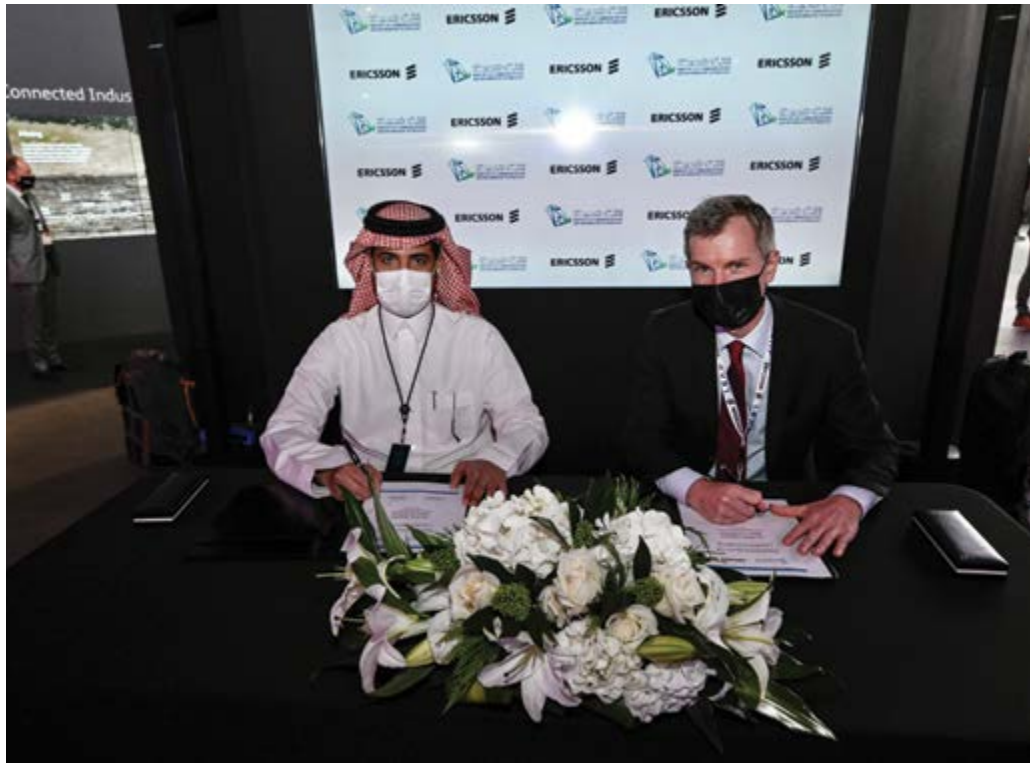
The rise of Industry 4.0 is the biggest change facing the manufacturing sector today. Yet, through 5G's limitless connectivity and real-time cyber-physical collaboration it represents a paradigm shift in how factories of the future will operate. Today, no factory can afford to stay away from smart manufacturing and risk losing out on new growth opportunities. These

Fadhel Issa, Head of Networks for Customer Unit, Ericsson MEA

are exciting times for Industry 4.0, as manufacturers redefine business to create massive efficiencies and opportunities across the value chain. The Saudi manufacturing sector is well-positioned to capitalize on these changes and establish itself as a leading manufacturing and industrial powerhouse.

> Ericsson's 5G Innovation Hub in Riyadh was established to help the Kingdom leverage 5G

KSA 5G Together Apart hackathon
In collaboration with the Ministry of Communications and Information Technology (MCIT), Ericsson announces the launch of the KSA 5G Together Apart hackathon in the Kingdom of Saudi Arabia.



Mr. Ibrahem Alnasser, Assistant Deputy for Digital Entrepreneurship and Inclusion at MCIT says: "5G technology has the power to transform every single citizen's life, and that is why we have invested in developing this infrastructure. Public and private partnerships are vital to ensuring the goals of the national vision are achieved. By actively engaging with skilled and talented Saudis, we have an opportunity to develop innovative ideas that help to transform our nation. This hackathon is an important platform to foster innovative ideas and develop commercially viable solutions that address the focus areas of Saudi Vision 2030."

The hackathon consists of two engagements: inspirational panel discussions and the hackathon competition. The virtual panel discussions kickstarted on 22nd of February 2022, in the presence of industry and thought leaders, and is open to the public to inspire the wider Saudi society.

The competition, to be held between 24th -26th of March 2022, will bring together qualified mentors with innovators, students, and entrepreneurs from across the Kingdom to create teams that hack for the future and develop solutions which contribute to creating a vibrant society, a thriving economy and an ambitious nation – the core pillars of Saudi Vision 2030.

The KSA 5G Together Apart hackathon will task participants to find innovative solutions using 5G based on five themes that align with the long-term vision of the Kingdom of Saudi Arabia. Ericsson calls on young and vibrant Saudis to imagine how 5G can contribute to the pillars of the Kingdom of Saudi Arabia's Vision 2030 to transform the nation into a diversified economy.

The KSA 5G Together Apart hackathon comprises of five main challenges with complementary panels to stimulate and inspire the teams' solutions namely:

Panel and Challenge 1: 5G impact and World Class Healthcare
Panel and Challenge 2: 5G Role and the Future of Entertainment
Panel and Challenge 3: Trusted Tourism with the rise of 5G
Panel and Challenge 4: Impactful Industrial 5G Technology
Panel and Challenge 5: 5G-and-beyond: Smart Cities & Transportation

Mathias Johansson, Vice President and Head of Saudi Arabia and Egypt at Ericsson Middle East and Africa says: "The KSA 5G Together Apart hackathon is another demonstration of our commitment to Saudi Arabia and its long-term goals. We believe that collaborative efforts are essential to reshaping the Kingdom's economy and society. In working together with the Ministry of Communications and Information Technology to establish the hackathon, we are aligning with the technological and innovation mandates of helping to digitally transform the Kingdom, creating efficiencies and new ways of working to future-proof the nation for decades."

Celebrating more than five years of the establishment of Saudi Vision 2030, Ericsson hopes to showcase the power of connectivity and 5G in propelling the nation forward. The KSA 5G Together Apart hackathon ultimately aims to support Saudi Arabia's reimagination for advancements in society and the economy through the power of 5G technology.

A total of five winning teams will be chosen - one winning team from each challenge area. The five winning teams will receive support in developing and scaling their solutions. One team will receive the grand prize to visit Ericsson's headquarters in Sweden to pitch their solution and interact with the entrepreneurial community.

The registration for interested participants is ongoing via https://www.ericsson.com/en/events/together-apart-hackathon-ksa and will be closed on 10th March 2022, while the winner announcement per theme will be on the 27th of April, 2022. TR

Benya partners with Egypt's first smart university

On the sidelines of the first edition of The Red Sea Maritime Transport and Logistics Conference (RSMTL) hosted by Egypt, Benya Marine, part of Benya Group –ICT infrastructure and digital transformation leader in Egypt, Africa and the Middle East – has signed a strategic partnership agreement with Egypt's first smart university Galala University.

The agreement aims to exchange knowledge and expertise between the two parties and leverage their resources. According to the MoU, Galala University students will benefit from Benya's expertise and capabilities. They will also have the chance to take part in summer internships and benefit from scholarships. Benya, on the other hand, will have access to the University's periodic scientific research outcomes.

The MoU was signed by Eng. Ahmed Mekky, chairman and CEO, Benya Group, and Dr. Mohammed Al Channawi, vice president of Galala University. The ceremony was attended by H.E. Kamel Al Wazir, minister of transport of Egypt; H.E. Wajih Azayza, minister of transport of Jordan; H.E. Hisham Abou Zeid, minister of transport of Sudan; and H.E. Dr. Khaled Abdel Ghaffar, minister of higher education and scientific research of Egypt.

CITC brings out 'WLAN Regulations' for speedy Wi-Fi technology adoption

In the hopes of accelerating the adoption and deployment of Wi-Fi6E in Saudi Arabia, the Communications and Information Technology Commission (CITC) has published its 'WLAN Regulations', which strengthens the Kingdom's regional and global leadership in the field Wi-Fi and license-exempt technologies, activates the latest generation of high-speed telecommunication technologies in the Kingdom, and enables the use of emerging and future technologies.

The 'WLAN Regulations' set out regulatory policy for the use of WLAN applications in the Kingdom and it makes available new spectrum in the 6 GHz and 60 GHz bands to stimulate further use of WLAN applications.

The WLAN regulation includes spectrum access rights, technical conditions, spectrum bands available for WLAN uses, indoor and outdoor usage restrictions.

The regulations is expected to support CITC's role as a digital regulator in enabling wireless technologies, enhance the quality of the wireless broadband services in the kingdom, enable innovative and smart applications, adopt the latest wi-fi technologies in the kingdom, and contribute to the growth of digital economy.

CITC plays a strategic role as a digital regulator to enable the digital transformation of the Kingdom and maximize it's digital economical value. This role is being executed through its progressive spectrum policy to implement the National Spectrum Strategy 2025 and the CITC Outlook for Commercial and Innovative Use of Spectrum 2023, which has a main pillar focusing on enabling the new generation of wireless services. Going forward CITC aims to consolidate its position for releasing large amounts of spectrum in an innovative manner to facilitate multiple use cases.

This innovative approach led the Wi-Fi Alliance to endorse the Kingdom's leadership in enabling the next generation of wireless services which will unleash a wave of new Wi-Fi 6E products and services to Saudi Arabia's consumers, enterprises, and economy. CITC aims to ensure the regulatory transparency and to enable the latest emerging technology applications such as WiGig, virtual and augmented reality (VR / AR) and the Internet of Things (IoT).

TDRA issues the UAE Digital Transformation Enablers report

The Telecommunications and Digital Government Regulatory Authority (TDRA) issued the UAE Digital Transformation Enablers Report. The report includes the milestones of the digital transformation process in the UAE since its establishment. The report also highlights briefly TDRA's role in empowering government entities and society throughout the process of digital transformation. This role is consistent with TDRA's mandate to work on two parallel and integrated tracks, which are to regulate and enable the ICT sector on the one hand, and digital transformation on the other hand.

The UAE Digital Transformation Enablers Report presents the results of key global indicators that reflect the UAE's leadership in digital maturity, as the UAE ranked among the best countries in the world in government digital transformation, to be the only Arab country in this category in the government digital maturity report issued by the World Bank.

The UAE also ranked 21 globally in the United Nations eGovernment Survey 2020, advancing by 8 places over the results of 2016. Moreover, the UAE ranked 8th globally in the Online Services Index within the UN eGovernment Development Index in 2020.

The report reviews the key digital initiatives undertaken by TDRA by virtue of its main responsibility for digital transformation in the UAE. The most important of these initiatives are the Federal Network, UAEPass, the Government Service Bus, and the national customer relationship management system (NCRM).

The report also highlighted the main enablers of digital transformation in the UAE, such as the digital signature (UAEPass), the digital verification platform (UAE Verify), the digital trust platform, the digital services marketplace, the Government Service Bus (GSB), the UAE Hackathon, the API marketplace, and others, highlighting the facts, figures and results related to these enablers.

This report sheds light on some of the digital government enablers managed by TDRA, and it does not cover all enablers, as some of these enablers are still under development and implementation. In subsequent versions of the report, TDRA will expand the dissemination of digital enablers to achieve inclusivity.

TRA set to drive network improvement in Oman with Ookla's solutions

The telecommunications regulatory authority of the sultanate of Oman (TRA) and Ookla are engaging in a collaborative arrangement as part of TRA's aim to leverage the latest technologies and up-to-date insights for understanding mobile and fixed broadband performance across Oman.

This comes at a time when 5G rollout in the country is gaining momentum, and Ookla's enterprise solutions and first-party data are set to empower TRA in assessing the adoption of 5G networks in the Sultanate. This collaboration should help drive network improvements in Oman, delivering significant new value to local mobile operators who build the networks and the consumers who rely on them.

"Ookla's unique data insights will help TRA identify weak spots and consequently guide network operators to improve their networks, in turn creating a better experience for the Omani people," said TRA executive manager strategic planning unit Engr. Ahmed Hassan Al Haddabi. "We look forward to leveraging Ookla's data to assist us in making informed decisions for advancing Oman's ranking internationally in support of the government's Oman 2040 vision."

Ookla's high-caliber network intelligence solutions will give the TRA an insightful view of network performance in Oman, and allow it to benchmark against its regional peers. This effort further aligns with the goals of the Oman 2040 vision of preparing for the impacts of technology and the digital transformation taking place in the Sultanate.

Thrilled to assist and support TRA as they seek to drive the development of Oman's telecom sector, Ookla co-founder and CEO Doug Suttles said, "With our consumer-initiated methodology, powerful cross-platform testing engine and global network of high-throughput servers, Ookla is a definitive source for 5G network intelligence and measurement. Ookla works with many regulators in the GCC states and beyond to provide actionable insights into the performance of national 5G networks as they evolve."

Steven Yi, President of Huawei Middle East

Saudi Arabia's business environment key factor to Huawei's success

In an exclusive interview with Telecom Review, Shunli Wang, VP, public affairs & communication department, Huawei Tech Middle East, talks about his company's latest products and solutions for the Middle East region as well as its participation in the LEAP2022 technology and innovation conference, in Riyadh.

How does Huawei plan to strengthen its government relations and CSR within the Kingdom for ecosystem expansion?

We are excited to join LEAP 2022 in Saudi. If you look at the digitalization roadmap from the Saudi government side, it already shows us their procedure and the initiatives for the future. Huawei products and solutions have helped our customers and partners, including the developers to enable the whole society in terms of digital transformation. Huawei is already an active contributor as our solutions and products are already widely deployed in many sectors such as government sectors, telecom operators, and even small and large stakeholder enterprises, which are good examples of Huawei's presence in Saudi. Meanwhile, we think the Saudi government also provides a very favorable business environment which is a key factor to Huawei's success in Saudi for the past 22 years. As you might know, Huawei is going to launch its biggest flagship store overseas in Saudi. In addition, we are also going to build the Huawei cloud region in Saudi, which is also a good way to show Huawei's ability and the latest solutions to the whole Middle East region. Moreover, as part of Huawei's corporate social responsibility in Saudi, a MoU with the Saudi digital academy (SDA) has been signed for talent cultivation.

What's the importance of Huawei's participation in LEAP 2022 and what are you showcasing here?

First of all, LEAP 2022 coincides with the first day of Chinese New Year and we are excited to show our latest technology and products such as 5G, digital power, Huawei Cloud, and also other applications to the whole Middle East. We are also collaborating with our strategic partners and our customers and selected carriers for 5G industry innovation projects with various industries, which they are showcasing in the carrier's booth. This time we also bring the green network and the green products that are in line with the Saudi government's carbon emission reduction initiatives. Compared with the traditional products and solutions, our new solutions and products can save 30% in terms of carbon emission.

What can we expect from Huawei's presence in the Middle East in 2022?

First of all, we are continuously bringing our new products and solutions to serve our customers in the whole Middle East region. Our green network and green products save up to 30% of power consumption compared with traditional products, promoting successful sustainability.

We are going to build a cloud region in Saudi. This is also one of the milestones for Huawei's cloud service development in this region.

We are also going to build on talent. We are going to achieve another 100,000 youth talents in the coming five years as it is fundamental for the digital transformation efforts. Huawei is dedicated to developing youth talents and it is one of our strategic plans for the future. TR

BENYA Systems | BENYA Engineering | BENYA Cables | BENYA DRC | BENYA Cloud | BENYA Ventures | BENYA Marine

Henrique Vale, Head of Cloud and Network Services, Nokia MEA

Nokia driving new value creation with CNS

Nokia has been striving to pursue the goal of becoming a leader in cloud-based network software. To explain more about the company's cloud and networks services (CNS) strategy, Telecom Review spoke to Henrique Vale, Head of Cloud and Network Services, Nokia MEA.

Please tell us a bit about Nokia CNS business. How is it making a difference in the cloud and network services?
The cloud and network services business group is the growth engine for Nokia. Our focus is to create value for both service providers and enterprise customers by leading the transition to cloud-native software and as-a-service delivery models as demand for critical networks accelerates. The growth engine is underpinned by our commitment to take technology leadership in six domains. We have already witnessed initial success in 2021 with reset of our strategy and will see it accelerated further in this year.

As more countries roll out 5G networks, how is CNS helping customers in the MEA region transform their 5G core infrastructure in terms of flexibility, scalability and security?
5G is much more than just a technology. It is poised to empower new industry models and change how value is delivered through telco networks. These new business models come with their own challenges with architecture design, scale and operational complexity that has never been seen by traditional telco software. Openness of the network to support new busines models brings security challenges.

Nokia CNS' 'any cloud' strategy provides CSPs with flexibility to choose core deployment on any cloud (private cloud, public cloud or hybrid cloud). Our cloud native approach is validated by Dish in North America markets where CNS core deployment on public cloud helps with the scale of geographical as well as time to value.

CNS' deep telco knowledge helps customer in MEA address network security challenges that are very unique to 5G networks. In the coming years, we foresee security adoption accelerating in MEA and SaaS based XDR product will help in minimizing deployment time and scalability.

5G and automation are complementary to each other. What are the challenges in implementing automation and AI in 5G networks and what are the solutions to fix them?
Nokia and STL surveyed 100 CSPs globally in 2021. Seventy one percent of respondents said they aspire to move "beyond connectivity" aiming to offer services build on value-add platforms and applications that inherently require business, network and service automation.

Solving automation challenge in existing deployment is like a giant puzzle with thousands of pieces. Key to success lies in making right choices on where to start, which areas to prioritize for incremental benefits, and most importantly, how do we address people and cultural challenge as getting automation benefits is much more than just addressing technology component.

At Nokia, we follow four principles.

Principle 1: Know your 'why'
One of the most important items to get clear on is the business purpose of automation. It's not about what you can automate. It's about why you should automate it. It's about the benefits it will bring. To yield the most meaningful benefits, choice of use cases should be value-driven.

Principle 2: Work incrementally
We should not try to solve automation as a 1,000-piece puzzle. We should first try to solve it as a 10-piece puzzle, then a 20-piece puzzle and then a 30-piece puzzle, and start to build organizational maturity to handle automation, and scale it. If you start with a 1,000-piece puzzle, you're bound for failure compared to starting with a smaller problem set."

Automation to be addressed in different layers of the network as per diagram

below. The top of the pyramid is all about business requirements fulfilled by service automation while layer below need to automate to support and drive that outcome. This requires high degree of sophistication and efficiency which is enhanced by use of artificial intelligence.

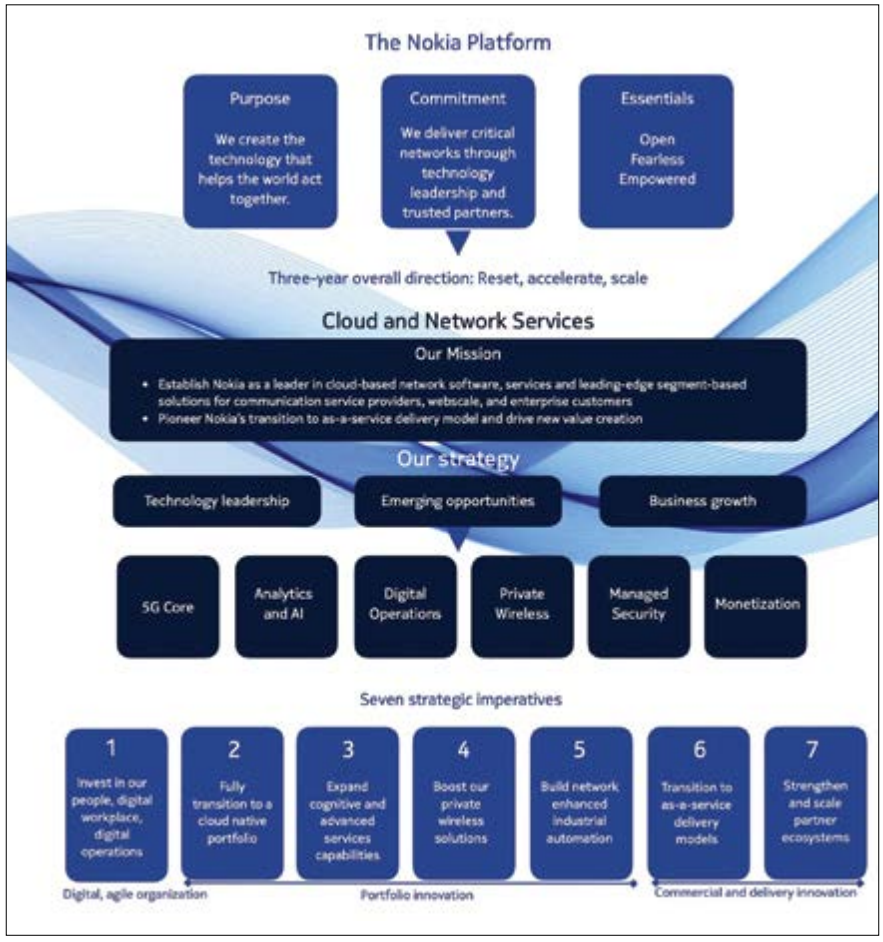
Principle 3: Use open APIs everywhere
Embracing openness - specifically open interfaces - is key to linking up the pieces of the automation puzzle. Open APIs make it easier to connect bits of data, functions and business processes together in a frictionless manner. In order to automate a set of components, the components need to be standardized first.

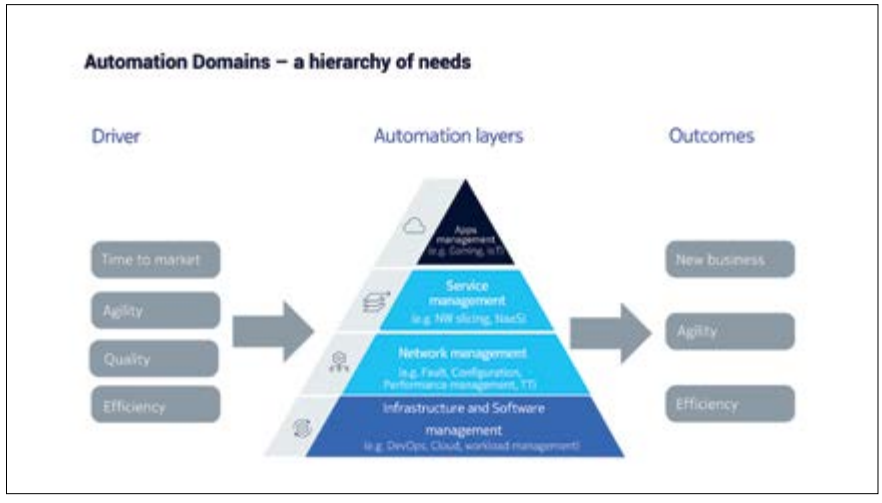
Principle 4: Change your mindset
Automation is not a technology problem but a deep cultural and skill issue with people who are involved or impacted in automation. Because in the process, people are moved into other people's territory, disrupting the status quo of people in terms of their thinking and comfort zone. In this kind of transformation, technology role is only 10 percent, but people's role is 90 percent. Therefore, changing the mindset is they prerequisite.

How can CSPs and enterprise businesses benefit from Software as a Service model? How can CNS help?
According to Bell Labs Consulting, 5G technology will generate $2 trillion of additional value for the telecoms industry by 2028. CSPs could potentially quadruple their revenues from largely untapped vertical markets such as factory automation, smart cities, AR education, cloud gaming and more.

To capitalize on this opportunity, CSPs first need to become more customer-centric in everything they do, redefining their business models to drive top-line growth, foster innovation and streamline operations.
At the heart of this change is a shift to a cloud-based software-as-a-service (SaaS) business model providing flexibility, scale and openness. The SaaS model gives CSPs higher levels of business agility and faster time to market for new digital services. SaaS provides the right combination of rapid time-to-value with on-demand access to mature SaaS applications and lower TCO. CSPs can achieve this with pay-as-you-go / pay-as-you-grow commercial models.

To drive that shift, Nokia's approach to telco SaaS for CSPs is about providing software that is always the latest version and hosted in any cloud environment. As we introduce SaaS services in a simplified delivery model, Nokia expects to combine these independent services into three high-value SaaS "suites" focused on digital engagement, marketplaces and networking. TR





Atos:

Significant player in the edge and AI marketplace

Keyur Joshi, head of AI, HPC, & cyber products, MET at Atos

No longer limited to providing basic phone and internet service, the telecom industry is at the epicentre of technological growth, led by mobile and broadband services in the Internet of Things (IoT) era. From fixed telephony to Internet Protocol Telephony (IPT), and from dedicated connectivity to shared and packetized connectivity, telcos have transitioned from being confined to a local geography to going global, and then settling to regional and /or multinational – it has been a great journey so far.

In an exclusive interview with Telecom Review, Keyur Joshi, head of AI, HPC, & cyber products, MET at Atos discusses the trends that are shaping the current technological landscape, defined by the advent of 5G, cloud, AI and edge computing. As such, telcos are pursuing opportunities to diversify and monetise 5G, whilst media organisations must respond to the expectations of an audience that demands more individually personalised and diverse mobile and connected experiences.

"At the moment, we're seeing telcos running two parallel tracks, as they want to secure their position with last mile connectivity in fibre or 5G whilst also wanting to branch out beyond connectivity, even though it makes a large part of their business," Joshi observes. "Telcos want to branch out and create a position for themselves in the digital ecosystem alongside other telcos and public cloud providers."

Amidst this movement, the major challenges in this space are to deal with application, infrastructure transformation and cloudification, and data monetization, thus optimising business operations and freeing up capacity and resources for telco customers to further focus on broadband, fixed and fibre based, or mobile based services and to enable more opportunities in the B2B space.

At the nexus of these optimisations is the potential of intelligent edge computing and artificial intelligence (AI).

Intelligent edge

Intelligent edge is poised to transform the computing landscape, propelling the world's largest technology companies toward the next generation of connectivity and operational efficiency. By bringing powerful computing capabilities closer to where data originates and needs to be consumed, the intelligent edge unlocks the potential for faster, cheaper, less energy consuming and more secure operations in everything from quality control to virtual reality to the Internet of Things (IoT).

Edge computing locates computing and storage resources at the edge of the network, with the intention of "getting data and computation at the right place and right time in a more decentralized manner" and to elude non-essential data transmissions over the network. Gartner defines edge computing as "solutions that facilitate data processing at or near the source of data generation".

The edge computing market will allow diverse market actors to have their say in providing edge computing products and services. These range from system integrators, major cloud providers, hardware and software vendors, telecom operators and more. In this scenario, different players and strategies come into play.

The edge market is mainly categorized into:

- **Consumer edge:** Represents vendors in the field of consumer electronics who are likely to address the opportunities that edge computing brings by embedding (or allowing to interact) edge intelligence in their devices.

- **Software edge:** These are vendors, mainly major cloud providers, who offer software platforms to be used in conjunction with their IoT cloud services and installed in edge devices provided by the user.
- **Born at edge:** While all the previous categories refer to existing vendors who are - in different ways - extending or adjusting their existing products or services to cover the edge market spectrum, this one refers to specialized edge computing vendors whose offerings only focus on this market.
- **Hardware edge:** This category presents actual hardware device vendors who are including, as part of their products, the development or packaging of software tools that enable edge workload management

Atos, via its edge computing server range (BullSequana Edge, BullSequana Edge nano and BullSequana SA20G) combined with Atos Computer Vision Platform & Outcome-driven AI platform is already a significant player in the edge and AI marketplace. The group has been recognized in 2020 and 2021 by analysts for its "leading" position on the market.

Atos provides an end-to-end offering from edge computing infrastructure, AI solutions with pre-trained and customizable AI models using computer vision, NLP, ML technologies and enriched by Atos AI/ML experts through worldwide expert's labs.

Accelerating AI

As business leaders investigate the excitement surrounding artificial intelligence (AI), they continually find evidence of AI's massive return-on-investment (ROI) potential.

Enterprises are continually finding new and innovative ways to achieve enormous competitive advantages with AI in all business verticals – including data analytics, workflow efficiency, customer relationship management, and marketing. Now, with the latest advancements in computer vision technology, AI is bringing new ROI opportunities to an even wider range of industries and use-cases.

All innovative endeavours at Atos are entirely guided by customer demand. Indeed, Atos' ability to serve its clients with tailored end-to-end solutions is the company's greatest differentiator.

Atos' technological prowess within AI has been further strengthened by Atos 'recent strategic acquisition of Ipsotek - a leading enhanced video analytics software provider – that took place in April this year and the acquisition of DataSentics, a data science company specializing in the development of artificial intelligence and machine learning (AI/ML) business solutions and products – that took place in November 2021.

Ipsotek, at the heart of the software layer of Atos Computer Vision Platform, enables users to efficiently manage automatically generated alerts in real-time. This offering can be applied to a range of functions, such as traffic management, number plate recognition, intrusion detection, and crowd management, to name a few, alongside multi-camera tracking capabilities. Ipsotek is a reputable name in the industry, having executed over 600 projects in 38 countries.

Putting AI to work

Modern organisations generate a rich and huge amount of data from their network and customer interactions, which could be the basis to develop:

- **Hyper-personalisation -** Every customer of Atos is unique in terms of context and needs. This demands capability to process a huge amount of data and create 'segment-of-one at scale' (i.e., several 100s of millions of customers) and drive actions e.g., product recommendation, offer management, experience management etc., in order to deliver personalised digital experiences and services.
- **Autonomous network operations -** Customers' tolerance of service outages is diminishing as they increasingly rely on digital connectivity services for their daily life. This means detecting and fixing service issues before customers notice them as well as faster route cause analysis (RCA) become vital to improving customer experience and retention. This requires processing huge amount of historical as well as real time streaming data to detect anomalies, predict degradation/ outages and recommend resolution.
- **Zero-touch, Zero**-trust prescriptive security - The cybersecurity landscape is evolving fast with a sophisticated threat profile, which is beyond the processing capability of the human brain. AI/ML-driven security operations to detect and respond to threats before they occur is crucial for Telcos.
- **Customer value management** – Ability to predict churn propensity at individual customer level and drive actions to mitigate the circumstances driving churn is critical to retain customers in a saturated market. AL/ML and analytics play a crucial role in predictive churn management.
- **Improving customer experience -** While minimising cost by leveraging intelligent chat bots with capability for natural language processing (NLP) which relies on AI.
- **Cognitive services to generate incremental revenue –** Computer vision technologies using AI enable the creation of several additional revenue generating services for the B2B segment.

Looking forward

Atos will continue to focus on the people behind the technology.

"Our first and foremost priority is to invest in our people with both competence lift and augmentation, increasing what we already have in house," explains Joshi, with a particular emphasis on the hybrid cloud space in 5G private MEC and security.

"Secondly, to integrate and to provide technology, you need partners, they are key in the tech space not just to us but all players in the space."

Joshi concluded, "In the coming year, we want to focus much more on certain partners and partnerships because it's these effective relationships that amount to a win-win situation for both parties and their customers."
With a people-centric focus guiding its expansion, Atos guarantees a prosperous future. TR

The new human interface:

Merging physical and digital worlds

The line between the physical and digital worlds has been steadily blending, with the goal of fulfilling the future metaverse. This total immersion experience could take years to mature but the metaverse market is already estimated to generate almost $800 billion in 2024.

Moreover, by 2030, the metaverse market is expected to grow by over 40% annually, showing great opportunity for openness and collaboration among policymakers, experts, industry partners, telecom operators, and other digital-based companies.

The new communications realm will extend beyond borders and could enable limitless opportunities in various sectors — gaming, retail, medical, financial, and construction, among others. Nevertheless, to be able to succeed in this visionary world, many factors must be considered.

The next level of immersion

For consumers or enterprises, metaverse addresses the increasing engagement with digital systems, socializing through digital space, and driving interconnectedness. The metaverse is going to be a collection of experiences across devices, time, and place, in a mixed reality landscape.

These experiences will be enabled by a new infrastructure that allows global instant real-time communications, with new ways to manage presence and interactions as well as earn and secure assets of all kinds. In a bird's eye view, there is no single metaverse today. With a lot of different metaverses — mostly gaming with others in initial development stages — our digital interactions are evolving from the devices and interfaces we interact with into an extension of ourselves.

Let's zoom in to the Middle East region alone. Being one of the most-advanced tech hubs in the world, it is no surprise that a lot of metaverse-inspired projects have already been announced, with more to come in the near future. One of the most-awaited ones is Neom Tech & Digital's XVRS platform which creates a cognitive digital twin metaverse that will enable visitors in NEOM as an avatar or hologram. XVRS will offer a virtual representation of NEOM, helping with the actual construction of the billion-dollar futuristic city. On the other hand, representing the future of dining, the MetaTerrace in DIFC can give its customers a metaverse experience as an entertainment offering. Additionally, Dubai's MOHAP taps the metaverse to improve the lives of citizens by debuting the world's first metaverse customer happiness service center. People can also join the group's MetaHealth space, receive key information, pay medical fees, submit documents, and perform other services virtually.

In the metaverse, our experiences will be 3D and multi-sensory — an upgrade from living 'on' the internet to 'in' the internet where you can even start buying digital land, construct virtual homes, play with international friends, and conduct simulation operations in real-time. In fact, Gartner expects that in a four-year timeframe (2026), 25% of people will spend at least one

hour a day in the metaverse for work, shopping, education, social media, and other activities.

By and large, metaverse requires multiple technologies and trends to function including augmented reality (AR), flexible work styles, head-mounted displays (HMDs), Internet of Things (IoT), 5G, artificial intelligence (AI), and spatial technologies.

As our virtual and physical worlds become more aggressively intertwined, metaverse may evolve to become a universal digital platform for personal and commercial interactions and become the source of the most valuable data.

What metaverse needs to succeed

With the potential of unlimited reality within virtual immersive worlds, the form and amount of content are going to be heavier. Thus, edge computing, faster connectivity from technologies like 5G and Wi-Fi 6, and faster processors must be invested in to ensure metaverses' seamless access, interaction, and development.

Embracing persistent worlds means the technological paradigm is going to be different. We have to maintain a living world and do simultaneous adjustments along the way. It's not like a game where you can pause, make changes, or restart. A persistent world is always on. Hence, there's a lot of room for innovation in terms of handling interactivity and scripting in an environment with millions of active users. What we have today is not adequate to facilitate adoption and needs to be evolved, in terms of architecture and technology innovation.

With high-speed 5G becoming mainstream and the availability of gigabit optical broadband networks, terminals such as VR glasses and motion sensing devices can connect to various servers to create a deeply immersive and realistic society. Taking the approach of being in a new generation of mobile internet, various remote education, remote shopping, cloud games, immersive tourism, and other application scenarios will become prominent applications.

These applications are already explored by operators, making metaverse an ideal stage to promote the emergence of 5G applications further. As a competitive edge, operators with 5G, gigabit optical broadband, big data, cloud and edge computing, among other capabilities at hand will have a favorable position in the metaverse than other digital companies.

Building a "connection + computing power + capability" network that is suitable to the metaverse will be a huge contribution to the thriving digital economy. Many experts believe that for the metaverse to mature and become meaningful, openness and more cooperation among tech giants like Microsoft, Meta, Google, and Apple are required. This will enrich deep integration and functionality.

It is yet to be known exactly how metaverse will impact future broadband speed and bandwidth requirements. What most analysts agree on is that this hybrid world will only fully work if latency is basically non-existent. This would mean more and bigger pipes to accommodate the bandwidth, speed, and latency needs of future customers.

More players continue to bet big on this trend as it paves the way of unlocking the future of the digital universe. It will apparently take years — or even decades — of R&D, innovation, and standardization to live up to the hype. As for the ICT industry, ultra-fast and high bandwidth connectivity requirements and the development of sophisticated apps and devices toolkits bring massive business monetization opportunities.

For the new human interface to succeed, digital business strategies that leverage the built-in infrastructure of metaverse must be established. Along with this, the unique technology risk, privacy, and security implications in this new persistent and decentralized environment must be identified and mitigated properly.

In a nutshell, the metaverse concept is getting a lot of publicity at the moment, but it is still at a very early stage. How this pans out will depend on the digital foundations that we build today, which include smooth connectivity and high levels of interoperability across devices, cloud platforms, and networks. The need for low-latency, high bandwidth ultra-resilient networks is set to surge, bringing together CSPs, cloud providers, content developers, hardware manufacturers, regulators, etc. TR

Ahmed Alenazi, stc pay CEO

stc pay leads KSA's fintech sector

During LEAP 2022, Ahmed Alenazi, stc pay CEO, had an exclusive interview with Telecom Review where he talked about the journey of being a technology-based company that delivers fully digital services. As one of the largest fintech unicorns in the Kingdom, the executive shared how the country's fintech sector will thrive further, with stc pay as a leading player.

Stc pay is evolving from being a mobile wallet into a digital bank. How did this impact the overall corporate and business growth?

We started in 2018 as part of the sandbox introduced by the regulator (central bank of Saudi Arabia) which allows players like stc pay to come and test their services and serve clients in a controlled environment. This was the beginning. We were focused on serving consumers in Saudi, with a unique proposition starting from a very simple wallet with multiple sets of features.

In 2020, we gained our first electronic money institute (EMI) license. Growing further, we got Western Union as one of our partners to provide remittance

service where it bought 15% shares at a $1.3 billion valuation, making stc pay the first and largest fintech unicorn in the Middle East.

From then until today, we are serving more than 7.8 million users with 3.7 million cards in the market. Despite being focused on the Saudi market, we cater to the international market via remittances and unique services. In remittances, we are talking about international payments which are very complicated due to different regulators and currency conversions. Yet, we made it easy. You can send, amend, track, and cancel the transaction at any point in time and get refunded instantly. Nobody will find all combined services around the world, making stc pay unique in its services.

At the end of Q2 2021, we got the approval from the government to convert stc pay to be a bank, and now we are still in the process of conversion where we will be known for a better user experience and unique value proposition with big ambitions in the future.

As one of the unicorns in the industry, what exciting plans do you have in store for 2022?

For one, we are in the process of finishing up our paperwork and requirements to the regulator and launching as a bank, providing very unique products and services that the consumer needs. As an example, early this year, we launched Qattah, which enables users to split payments. If you go with your friends and pay for dinner and you ask people to share, this can be used and we made it very unique. Consumers can even ask for Qattah in advance if they are traveling.

We are just serving consumers at the moment, as we partner with local banks. Later on, we plan to expand for large-scale payroll as we still cater only to companies with 30 employees or less. We are very focused and we don't want to jump into multiple things. We want to provide the right and unique service that consumer needs — whether an enterprise or individual. Hence, we are following a very clear strategy. We know exactly what we're doing and we will carry on doing that because ideas are always there. The hardest thing is converting that particular idea to reality and having a very strong use case for consumers.

What makes fintech ideal for business and consumers, and how did LEAP become an avenue for it?

Technology has been growing very fast. I think this is something good for consumers to capitalize on and make their life very easy — from watching TV or reading the newspaper physically to reading digitally or watching on-demand like Netflix and others. These activities show a full change in consumer behavior.

Previously, they are willing to wait for days or hours to get a service, which now requires instant and simultaneous offerings. Fintech will definitely come and help consumers get their products and services, with speed and easiness. In financial technology or fintech, it's important to point out that it's not the technology that is driving us but we drive the technology based on the user persona and consumer needs to serve them properly.

I think this will carry on and will continue to advance as today you see different technologies emerging. I do believe fintech will stay and grow exponentially. Firstly, the beauty, especially about the Saudi market is the youth generation where 70% are below the age of 35 and 40% are below the age of 18. Secondly, smartphones and 5G adoption and combination are already there, in addition to the support by the government with regulations in place like a sandbox where they welcome innovative ideas from anyone.

Thirdly, the Saudi Vision 2030 also includes a whole program about financial service development. One of them is reducing cash or reducing friction around the financial services to make it easy for people. The fourth success factor is the eKYC infrastructure already present within banks and other related entities.

As a Saudi national, I want to see many fintech unicorns coming, creating a Silicon Valley in the region — a world that provides seamless financial services and other services from Saudi.

What we can see from LEAP as well is that there are a lot of young Saudis and a lot of international players talking to the young generation which is very motivating. They have that passion to do a lot of activities. I believe that nobody can stop someone that has a passion to deliver something, and the LEAP event is only a start.

Today, we know where we are heading, we have all the support to do it, and we have passion along with it. You will not find this combination anywhere, and here in KSA, we will do it by all means.

What is your perspective on the thriving fintech sector within the Kingdom in the next few years?

It will grow from having only a couple of players now. In the near future, it would definitely expand with the surrounding ambitions as well as the momentum and consumer needs. This is something that will not stop. You will see a lot of fintech players from Saudi going into different markets and serving consumers beyond the country.

Do you think being part of stc Group helped you to grow fast?

Definitely. stc is a very recognized and trusted brand. Aside from this, we added Western Union, Visa, mada, along with different players in the market such as banks to fintech service providers, which gave more confidence from the consumers and regulators.

It's already planned from day one to put stc as part of the brand name to gain trust and then gradually add different financial players on top of it to gain trust from the consumers for the newly-established company.

This gave us the trust, momentum, and the easiness of reaching consumers and providing financial services which were, at that time, new for a telco group. This is why we are now becoming the largest fintech player in the Middle East, the first financial unicorn in the region, serving more than 7.8 million users. TR

Doug Suttles, cofounder and CEO, Ookla

Ookla is the ideal provider of network intelligence and connectivity insights around the world, says CEO

On the sidelines of MWC22 in Barcelona, Telecom Review secured a one-on-one interview with Doug Suttles, cofounder and CEO of Ookla to talk more about how the company obtains credible results, its role in boosting connectivity, and some of its ongoing projects.

What criteria do you use to rate network performance? And how do you ensure the accuracy and credibility of results?
There are two sides to the Ookla and Speedtest business, which are the consumer and the enterprise. First, we look at making sure we produce a platform and a test that is accurate and the consumers trust. The result produces a large volume of data that enables us to benchmark and help operators improve their networks. We use standard metrics: download, upload, throughput measures, latency, and jitter, in addition to multiple supplementary metrics that we collect. Then, we put all these together with a lot of robust data science to ensure that we are ranking things correctly, and that we properly assess performance.

How does Ookla contribute to improving connectivity?
We are a brand known worldwide. The fact that we measure everywhere and are trusted by the consumer makes us be the ideal provider of insights to operators around the world. We know where networks exist, how they perform, whether operators themselves are using the platform for business reasons, or if it is regulators trying to look, see, and ensure that all of their population is able to get good internet connectivity. We are the ultimate source for that information.

How did testing evolve in parallel with technological developments? And what is coming next?
In the beginning, the first Speedtest from Ookla was the website Speedtest.net, which clearly is not intended for mobile measurement; but this was back in 2006, even before smartphones became common. Fast forward to now where everyone has fiber and 5G, the technology is not the same anymore. One of the things that has changed from my viewpoint, is to be able to measure the capacities that are out there these days. We are the only global platform that can do this, mainly because we have more than 16,000 servers around the world and our testing infrastructure is very unique. It is important to note that these are not server farms, our servers are deployed everywhere, in every country.

When someone takes a test, we, from our side, start by talking to one server, and then adding in the others so that we make sure that the bottleneck is nowhere in between. This is how we truly can measure the capacity of the last mile of a network as a result. The process is a lot more detailed, but this is a broad idea to describe it and explain the biggest chain and the biggest evolution of testing over the years.

Can you tell us more about the new Ookla Wind product suite?
We have been a 'crowd company' for years since both Speedtest and Downdetector provide us with insights and measurements from the crowd. These services are great for benchmarking and assessing problems or incidents. However, we can only see networks that are alive, meaning that we cannot help the customer build their network because it is not visible to us until it is turned on from the customer's side, and that is where we start gaining data. Then, the data gathered can indicate where there might be an issue. 'Wind' helps actively solve problems for telcos in real-time:.On the one hand, it extends what we can do: site assessment, ensure the good functioning of infrastructure before turning it live, have real-time results – which is a unique, fast, and instant test and measurement platform – and on the other hand, it can now detect the issue and solve it with the tools and services Ookla can provide.

How does Ookla's recent acquisition of RootMetrics fit into your future plans?
In the same logic of having an expanded product suite, RootMetrics helps us further extend into new solutions of deeper engineering and great problem solving. First, RootMetrics offers controlled scientific testing. We can collect so much more detailed network data that we couldn't collect before from the crowd. We knew we needed to do that in some way, as we're further expanding beyond the crowd. But, what is important as well is controlled testing informing the crowd as a form of validation that can happen around the world. We, as Ookla, want to validate our results with the crowd's trust: with scientific testing using the same Speedtest. We can do a control drive in a metro area, for example, have the results coincide, and have the rest of the crowd in that geography become valid.

This is our vision. We will do more of the traditional drive testing that Rootmetrics has always done, but our goal is to blend it together and have this be a one-stop-shop. TR

> We know where networks exist, how they perform, whether operators themselves are using the platform for business reasons, or if it is regulators trying to look, see, and ensure that all of their population is able to get good internet connectivity

Second phase of the 5G decade:

A glimpse

With around 200 operators having commercial 5G deployed, and almost 300 operators investing in this technology, the commercialization of 5G networks is accelerating globally. Over 1 billion 5G connections are expected by 2023, making 5G communications a key to personal consumption experience upgrades and digital industrial transformation.

Diving into the technicalities of the latest mobile generation, 3GPP agreed last December 2021 on the priorities of the 5G update, officially known as 5G Advanced. The first specifications of 5G Advanced, which will be contained in Release 18, are aimed for approval at the end of Q1 2024 and then improved during the rest of the decade, continuing later on with 6G.

5G Advanced starts the second phase of the 5G decade by bringing a new wave of wireless technology innovation, transforming architecture, and enhancing functions. Leading telecom vendors Huawei, Nokia, Ericsson, and Qualcomm have been vocal in their perspectives towards 5G Advanced.

For Huawei, the 5G Advanced evolution is technologically presented as a comprehensive integration of ICT, industrial field network, and data technologies. Hence, 5G Advanced networks are critical for an inclusive infrastructure that brings interconnectedness between people, machines, materials, and methods. More so, combining 5G network with big data, AI, and other emerging technologies can achieve more accurate digital extraction and build data models based on rich algorithms and business features.

Relatively, Nokia sees 5G Advanced as a way to enhance network capabilities in four dimensions: experience, expansion, extension, and operational excellence. Digital experiences will become truly

immersive while the role of the network beyond communications is emphasized with high-precision location, presence, and timing technologies. 5G Advanced will also help bridge the digital divide by maximizing what mobile connectivity provides.

Additionally, Ericsson pointed out that one key component of 5G Advanced is the use of artificial intelligence (AI) based on machine learning (ML) techniques as AI/ML is expected to trigger a paradigm shift in future wireless networks. These automated solutions will be used to introduce intelligent network management and solve multi-dimensional optimization issues with respect to real-time and non-real-time network operations.

On the other hand, Qualcomm presented the new set of exciting projects that aims to deliver a balanced 5G Advanced evolution. These include delivering enhanced mobile broadband (eMBB) experiences and extending 5G for new use cases; driving new value in commercialization efforts and fully realizing 5G's potential; and bringing new levels of performance through 5G's end-to-end system.

Taking all of these into consideration, mobile communication is always in a state of innovation and development, with the first phase of 5G standards commercially deployed and would be evolving from 2022 and beyond. Among all the new developments 5G Advanced entails, let's zoom in on some of its fascinating capabilities.

5G Advanced capabilities

5G Advanced aims to expand end-to-end system with wireless machine learning across radio access networks (RAN), devices, and air interfaces by implementing network architecture, AI/ML procedure, and data management enhancements, alongside supporting new and expanded use cases.

The path toward 5G Advanced begins with Release 17. Significant enhancements to several RAN functionalities that are already deployed in live new radio (NR) networks are made such as beamforming, multiple-input multiple-output (MIMO), dynamic spectrum sharing, user equipment power savings, positioning, ultra-reliable low-latency communications (URLLC), NR coverage, non-terrestrial networks (NTN), non-public networks (NPN), and edge computing.

Moreover, the concept of cloud-native, edge network, and network-as-a-service (NaaS) are also integrated alongside 5G Advanced to continue enhancing network capabilities and eventually move toward a cloud computing-based network integration. Thus, 5G Advanced networks are vital to have the characteristics of AI, convergence, and enablement (ACE).

As 5G develops, it is necessary to improve the capabilities and quality of services at all levels by introducing intelligent assistance. In parallel with this, the convergence of different access modes and networks is a development trend of 5G Advanced, allowing the connectivity between the air and ground and accommodating the industrial Internet of Things (IIoT), Wi-Fi, fixed networks, and other multi-protocol services. Accordingly, the application of NaaS can be facilitated better with deterministic networking, customization, high reliability, global control and management, and self-evolution, among other capabilities. This will enable the next phase of 5G to provide industries with customized networks that are proactive, flexible, and resource isolated.

Faster, better, and farther — these describe 5G, in general, as it opens up new fields of application in different industries, may it be for automotive, manufacturing, fintech, or healthcare. What other wireless technologies fell short of in the past is now enabled with 5G. While many 5G applications are expected to directly impact how businesses run, its ability to improve accessibility and reach of mobile broadband as well as boost society's safety, health and security are more invaluable benefits.

Soon to be unfolded to many, 5G Advanced networks will support more diversified, more certain, and more open communication services based on end-to-end quality measurement and guarantee, equipped with time synchronization, location services, etc. TR

CAPEX spotlight:

Are telecom investments efficient?

Societies globally are all relying on technology, especially telecommunications, which powers the connectivity needed to communicate, work, and make transactions online. Driving innovation in 2022 and beyond will only see a surge on the pace and scope of digitization. With this comes massive capital expenditures or simply, CAPEX.

Telecom is one of the most investment-driven industries, claiming its spot as one of the sectors known as the 'bedrock' of global CAPEX. As per S&P Global, the global corporate capital expenditure is set to grow 13.3% in 2021, the biggest annual rise since 2007, signaling an economic recovery revive spending after last year's pandemic upheavals. From this, the information technology sector is leading the growth.

According to GSMA, between 2020 and 2025, mobile operators across the world will spend $1.1 trillion on CAPEX, with more than three-quarters of that intended for 5G-related investments. In 2021 alone, Dell' Oro stated that the worldwide telecom CAPEX increased 3% YoY in the first half of the year.

A more stable CAPEX trend relative to previous generations is anticipated as operators try to keep their CAPEX-to-revenue ratios below a certain threshold. But to achieve that, operators must ensure that investments are made at the right time, place, and way.

Network investment decisions are among the most difficult for operators to address, making CAPEX

optimization at the top of the agenda for telecom executives. Analysys Mason forecasts that all aspects of telcos' CAPEX between 2017 and 2026 is crucial within the time of significant change in networks and business models. To highlight, fiber-to-the-premises (FTTP) deployment will be pervasive after 2022, causing wireline investment to fall, and increased spending on 5G to prosper.

Problems and solutions

How can leading telecom executives approach their CAPEX and turn it into their most strategic weapon to beat their competition? If we think about it, the definition of a successful project investment can be determined based on time and budget, but most importantly whether the benefits of the project are delivered. Hence, poor decision-making within an industry that invests as much as telecoms can be very costly.

CAPEX optimization is a dynamic process. Given technical and commercial constraints, it's important to realize that the telco itself has the responsibility to define its limits, following its own strategic priorities. This will depend on the telco's size, positioning, client base, and long-term strategic orientation.

To illustrate, let's compare the capital decisions between an airline and telecom executive, who are both spending $6 billion of CAPEX. The airline is replacing old aircraft with new ones from a mix of configurations. On the other hand, the telecom executive needs to consider either expanding the wireline FTTH footprint, buying spectrum, upgrading cell towers to 5G wireless, or replacing legacy networks with cloud-native ones.

It is rather obvious that the complexity and diversity of telcos' CAPEX investments exist. From this, typical problems such as lack of coordinated planning between the business/commercial and technology/service delivery teams and lack of accountability in measuring ROI performance arise. At a time when the telecoms industry is at an inflection point, spending billions on new infrastructure investments should ensure returns. Yet, telecom executives have admitted previously that capital allocation and management are both deeply flawed and frustrating.

As the markets mature, cracking the CAPEX code for efficiency is a continual route as key CAPEX levers like subscriber numbers, traffic levels, and usage patterns must remain supported by the networks. In response, we are summarizing some of the suggested solutions gathered from industry analysts and experts in terms of fulfilling CAPEX effectiveness in terms of four S (situation, strategy, spend, and structure).

Comprehension of the current plan. With a clear understanding of the current CAPEX plan, executives can identify where spending doesn't align with strategic priorities. It also allows meaningful detection of the hot and cold zones where the company may be over-and-under investing.

Cost management. Wireless and wireline operators alike should implement these skills as an inherent core competence that can only be possible with substantial changes in the business/operating model. New pressures will mean a change in mindset and ability to adapt to the 'new normal'.

Relevant market opportunity. By having efficient planning/upgrade guidelines that can efficiently unleash the full capability of existing assets, it is important to invest in the most relevant market opportunity areas. This will be based on priorities related to highly profitable clusters, securing fast ROI.

Assessment of existing assets. The majority of operators have a long tail of products, networks, channels, and segments that are either lucrative or ineffective. Pruning product portfolios to make way for beneficial investment cases will underpin company strength in the long run.

Satisfaction and consumption. Before, CAPEX decisions were primarily based on technical criteria such as network coverage. Now, customer satisfaction is key, and it's not necessarily linked to network performance. Depending on their location and activities, expectations can vary greatly.

Full cost transparency. This must be established in order to identify, prioritize and optimize additional-saving measures. A stringent OPEX/CAPEX analysis must be done to let the responsible staff responsible know the current cost drivers and the potential alternatives.

Alignment of objectives. May it be for the long term or short term, telecom players must utilize steering tools and procedures to be aligned to actual business goals. An example is partnering with hyperscalers and OTT players to improve CAPEX efficiency and network capabilities. TR

Ned Taleb, CEO, B-YOND

'Telcos must be in charge of their own testing and assurance', says Ned Taleb

Ned Taleb, CEO of B-YOND talks to Telecom Review about the need for testing and assurance in building future ready networks and the future of AI/ML during MWC22 in Barcelona.

In today's Industry 4.0 era, automation and AI are among the most explored technologies. How could this impact the maturity of these technologies in digital transformation?

The networks are becoming more complex and more open. And the introduction of new vendors is adding a lot of complexity. There is an exponential requirement on automation. We are focusing primarily on testing and assurance. We are applying AI/ML for a classical problem, which is root cause analysis in pre-production and also in anomaly detection in production. We see AI/ML as a must not just to automate certain functions or jobs, but to enable a new business model for the telcos. Telcos are opening up their networks. The network is becoming like a platform. And we believe that telcos and not the vendors should be in charge of their own testing and assurance because what worked in the past, that of relying on one or two vendors, will no longer work going forward.

B-YOND brings the power of automation within the network lifecycle for a telco environment. How would the CI/CD approach particularly keep a 5G network cloud agile and efficient?

Telcos traditionally have been sometimes slow in introducing new services. And normally, the testing

cycle for a new technology like 5G, from what we have seen with many carriers, is around 18 months. What we're doing first and foremost is to ensure that we shorten that time-to-market or what we call time-to-revenue. 5G is fuelling a lot of demand for our technology. We have applied this for a variety of services. That can also apply to new technologies today; but 5G in particular, like 5G standalone, will require enhanced testing capacity.

However, the lines between lab-to-live and live-to-lab are getting blurry as some of the testing can happen in the production phase as well. Our vision, continuous testing, continuous assurance or continuous monitoring, is an extension of CI/CD pipeline. However, it is a very important to be automated. A lot of telcos we are seeing they are focusing on automating testing and less so on automating validation. So, root cause analysis is very important to pinpoint for us. And in the ways networks were built before around one or two OEM like Nokia, Ericsson or Huawei, the telcos relied a lot on the vendors to do their testing. But today with dozens of NFV vendors or ORAN vendors, the operators have to take back charge and only the telco can do very effective root cause analysis. And when you launch that service, in production, it is important to continue assuring that service. We look for anomalies and generate more testing in production as well.

We went to market in March 2020, which was the first month of the pandemic in the Western world. In 2021, we recorded a 3x growth for B-YOND, which was a massive growth. We are now deployed in production or live in labs at the largest telcos in the world like AT&T and Verizon. We are also live at clients like Ooredoo Qatar, which is getting prepared for the World Cup and with satellite companies like OneWeb. We also have dozens clients either in POC or minimum viable products. So, we believe we are going to have multiple announcements this year regarding new clients.

Can you tell us more about the motivation and significance of '#ML-Infused 5G' that B-YOND is promoting as part of your MWC 2022 participation?

As previously mentioned, 5G is an inflection point for us. We see a lot more demands with this technology. There is definitely a race, as an article by Eric Schmidt, the ex-CEO of Google describes how the US is behind China in 5G. So, shortening the cycle of the introduction of 5G is very important and the use of this hashtag helps with this goal. First, we have trained models in machine learning which is very important. We have already pre existing train models. We believe a big part of our success has been the access to data. We have 20+ years of relationships with the tier 1 carriers of the US. We have people in labs on technologies or with consultants, and hence we have definitely a headstart, almost a good two years in terms of training the models.

What exciting trends combining 5G, cloud, and AI do you look forward to in the coming years?

First I would say is ORAN. We are going to find two camps: Telcos that believe in ORAN and that are testing it like Vodafone, Telefonica; and telcos that do not believe as much in ORAN like a Swisscom or KPN. Regardless, from my perspective, a telco today can not avoid the ORAN and its testing is important.

In addition, we have introduced as part of our new company, a solutions called Realize and we've taken the B-YOND product and doing lab-as-a-service or managed labs and doing the full end to end cycle of testing these technologies.

Another trend that I'm looking forward to a lot is the intersection of edge and cloud. There's a lot of testing that's going to happen when you start getting into the edge. Combinations of cloud provider, edge location and what kind of application and telcos, is going to open up a massive need for testing. And there is a 5-6x delta in cost of applications depending on where you place them. We think there's going to be an inflection point here and we are starting to get more involved in testing things at the edge. A great example in application we've seen is in sports. There's a great recent article published by Ericsson which talks about how 5G is enabling telcos to offer sports analytics services. So we are working with our partners and the telcos to offer more services to the sports venues.

Which verticals or sectors do you think will be prominent in the future?

We have seen a few driven by security, some by the need for high availability, low latency applications, but smart manufacturing is definitely one. There's a lot of talks about private networks, but there's a lot of private networks that are either in design, or being engineered, yet very few are live or operational today. However, we're seeing a big demand by smart manufacturing and I am sure there's going to be others also to care about low latency and high availability. Hence the need for testing and assurance is once again very prevalent, because they're not building private networks just for the fun of it but because they want to make sure that these networks are very reliable and provide low latency. TR

> In 2021, we recorded a 3x growth for B-YOND, which was a massive growth

Modern transactions:

Telcos + fintech revolution

A financial revolution is taking place around the globe, with telecom companies among the significant players thriving in the financial technology (fintech) space. The shift to digital is set to be permanent, as financial services and payments are now powered by mobile phones, providing access to new data, embracing technological innovations, and changing mindsets of users.

Enabling greater financial inclusion, the fintech industry is mitigating frictions by following innovative business strategies that increase the financial capacities and financial health of individuals, households, and organizations worldwide. In fact, payments experts forecast that strong growth in non-cash payments will continue over the next five years, resulting in a cumulative increase in digital transactions of more than 50% above 2020 levels across the Middle East region alone.

On the cusp of a payments revolution, digital payments and transactions would be central to the new normal. Telcos are among the leading enablers now in the fintech space as they take customer relationships to the next level. These initiatives are in line with the visions declared by the governments in the GCC countries

such as Saudi Arabia, Kuwait, Qatar, and UAE which offer strong regulatory support for digital innovations and facilitate fintech innovation to build a globally integrated environment.

Fintech and telecom combined

Mobile operators have strong reasons to penetrate the fintech industry, bringing innovative and secure solutions to market at scale and offering its extensive reach, strong customer relationships, advanced analytics, and diverse partnerships. This brings rapid innovation, flexibility, and powerful access to the market with solid capabilities.

We are aware that telcos have broader customer reach and distribution capabilities compared to traditional financial services. Thus, with the development of smartphones and the ability to access banking facilities and capabilities on the go, telcos prove their greater relevance in the financial services segment.

The advantage lies not just with scale but also with timing wherein telco relationships can form earlier than banking relationships. The generation nowadays is typically in possession of a smartphone from a younger age, giving telco operators a head start in developing a relationship with customers. Besides, mobile penetration is considerably higher than banking penetration in emerging economies. This gives telecoms a dynamic edge for introducing financial products to their clients. As a result, telco-backed fintech not only benefits from rising market penetration levels but also takes a bigger share of the financial services pie from incumbents.

Interestingly, fintech companies identify their customers with account numbers while telcos will identify their customers with phone numbers. By providing financial services, telcos can build their creditworthiness to the unbanked population and now expand their horizons not just to provide data or telecom plans but contribute to financial inclusion. Without a doubt, financial services and mobile payments as a telecom value-added service (VAS) can be a lucrative potential that could be the trend in the coming years.

Universal accessibility, including in rural and remote areas, is a huge advantage that telcos can leverage for purposes other than just communications. Putting banking and fintech functionality on top of the vast existing telecommunications network opens a multitude of doors on both the business and consumer sides. The ability to use a regular phone as a telecom mobile wallet for transferring money and paying utility bills and rent, among other services, has proven to be truly invaluable for people with limited access to banks and those who opt for simple onboarding processes.

Fintech investment of telcos in the Middle East and Africa

Mobile payments and digital banking are at the top of telcos' fintech endeavors. It has been evident that the demand for digital financial services witnessed a surge as working practices and customer banking habits changed because of the COVID-19 pandemic. Hence, telcos have taken strides in offering these services for faster and more efficient experiences.

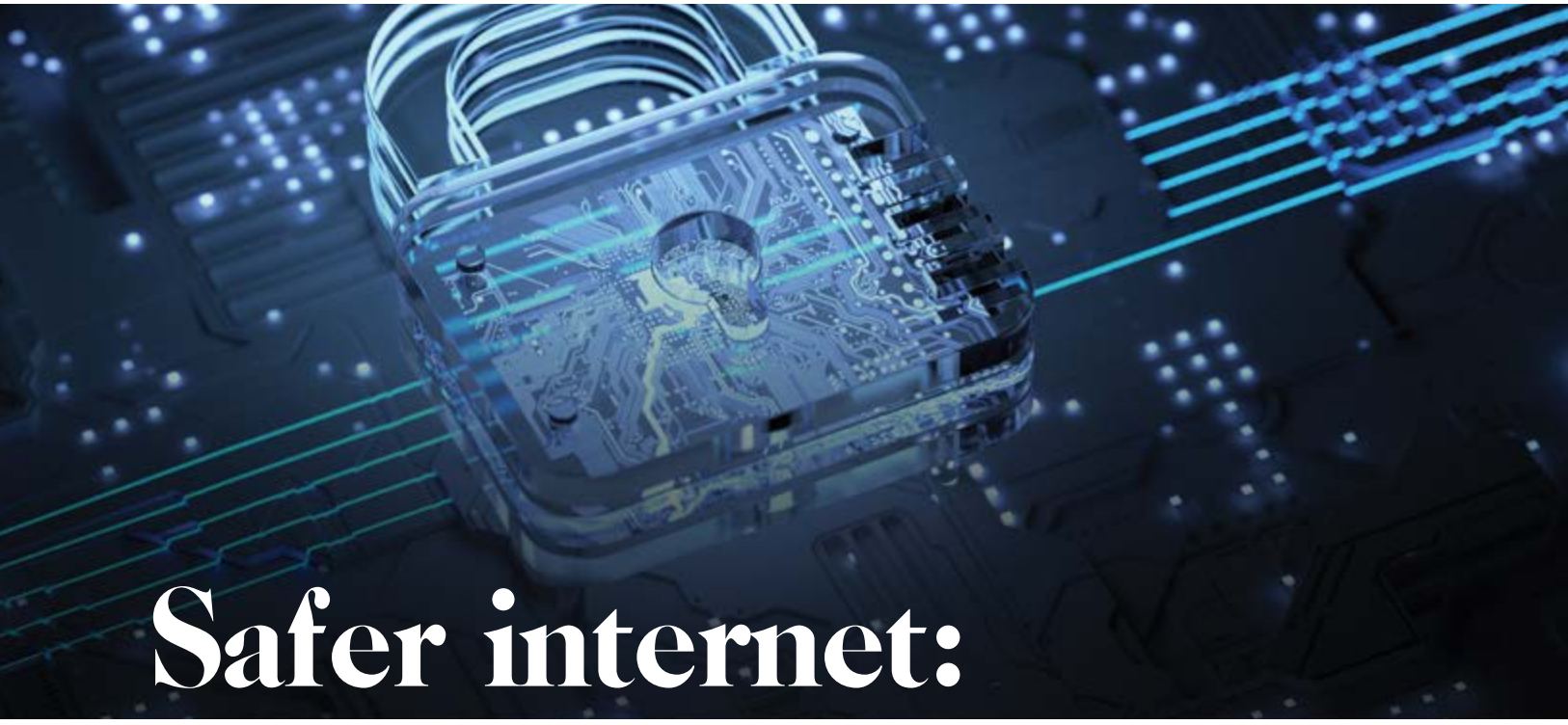
In 2020, regionally, the Middle East and North Africa (MENA) saw the strongest growth in fintech, showing an increase of 40%. Continuing in 2022, fintech investment is driving growth in MENA's digital economy as consumers pivot to cashless payments and the sector benefits from improved regulations. In parallel, according to a McKinsey survey focused on the Middle East payments market, 30% ranked telecom-backed wallets respondents to have the greatest impact on the future of payments. This affirms telecom companies as strong contenders in the fintech sector.

A notable example is stc pay, a leading fintech player in the region and the first financial unicorn in Saudi Arabia. Backed by the trust and reputation instilled in stc Group, the company now serves 7.8 million users. By digitizing international remittances through its partnership with Western Union, the company has managed to address key customer pain points and made it easier as they can send, amend, track, and cancel the transaction at any point in time and get refunded instantly through the platform. It is currently in the process of conversion into a digital bank.

Etisalat has also signed an agreement with leading fintech players to launch a new digital banking platform — Wio — that received in-principal approval from the Central Bank of the UAE. This partnership provides Etisalat the opportunity to invest in the growing digital banking sector and leverage synergies in this space by offering a broader portfolio of products and services. Owning 25% of the stakes, Etisalat, together with ADQ, First Abu Dhabi Bank (FAB), will enable Wio to offer customers in the UAE a fully digital banking choice with tailored products and services that meets their lifestyles and needs.

Using mobile phones to facilitate payments has definitely changed the dynamics in the MENA region, as one of the locations being seen to adapt fast to digital and contactless transactions. One of the early entrants is Safaricom which launched its mobile money transfer application M-PESA in Kenya in 2007. Then, it quickly gained traction with urban workers who wanted to send money to their families. M-PESA drastically expanded financial inclusion and now provides its safe, secure, and affordable platform to around 50 million people. In early 2020, Vodacom and Safaricom completed the acquisition of the M-PESA brand from Vodafone Group to accelerate the growth of M-PESA through Africa, recording 15 billion transactions in that year.

MTN's Mobile Money is also stimulating the adoption and usage of mobile money to facilitate payments. The use of its payment solution known as MoMo Pay facilitates everyday payment for goods and services. As per recent figures, there are over 22 million Mobile Money subscribers in 15 countries, and as part of the GSMA's Connected Women Commitment Initiative, MTN Mobile Money has committed to increasing the proportion of women in their MoMo Pay customer base to 40% by 2023. TR



Safer internet:

Data privacy and backups

In various parts of the world, a global campaign on safer internet day aims to promote being "together for a better internet". Everyone is encouraged to join the movement and participate in shaping and adapting platforms, services, and content for a safer and better internet.

Anyone connected to the internet can be susceptible to cybersecurity concerns, especially if certain precautionary measures are not followed. New cyber threats are constantly evolving especially in the modern era where almost everything is based on digital. Identity theft, cyberbullying, hackers, phishing, scams, malware, and click baits are all over the internet.

Thus, individual users and most importantly, organizations, must practice securing accounts, protecting web browsing, using antivirus software, updating devices, and enabling encryption. With these in mind, data privacy and backups are also vital elements needed to be considered and prioritized to keep a safe and ready digital experience.

Keeping your data private

You have probably witnessed being targeted by random advertisements online, either on social media networks, in-game, shopping, or just while browsing. This is proof of how our data is being utilized online. Data privacy, also known as information privacy, is an umbrella term that encompasses online, financial, and medical privacy. This type of data security is aimed at properly controlling the details you reveal about yourself online and who can access them (e.g. consent, notice, and regulatory obligations).

Literally called the 'world wide web,' we are technically trapped in a system where everything we do is logged and monitored. No data is really kept private or confidential anymore.

With a hacker estimated to attack every 39 seconds worldwide, data privacy is an alarming issue that needs to be taken seriously as it can put financial, browsing, and personal data at an increased risk. Many people assume that going incognito or using virtual private networks ensures full data privacy but we should be aware of how much information we are actually sharing online.

Ultimately, security and privacy are linked, so we need to get in the habit of protecting both. Thus, it is a must to establish good online behaviors such as avoiding clicking any suspicious links/banners/items online; having a strong password with multi-factor authentication; keeping your main email, address, and phone number out of public view; preventing linking accounts to avail services; and being distrustful to any 'good-to-be-true' offers as well as new products or tools.

Avoiding many privacy-invading practices such as unnecessary permissions and online forms bring up the importance of managing and securing data. In today's world, the value of data as a strategic asset and powerful source of economic value powers technologies like artificial intelligence, data analytics, and big data. As part of keeping your private data, data misuse or mismanagement can be avoided. Telcos and other ICT players are going big for 'data protection by design' and 'by default' principles to deliver privacy-enhancing and accountability measures.

According to Gartner, by 2023, 65% of the world's personal data will be covered under modern privacy regulations. This is inevitable as the volume of digital data generated nowadays, thanks to disruptive Industry 4.0 technologies, is massive that a single data breach can cause extensive damage.

Qatar and Saudi Arabia are among the Arab countries that will put into effect data protection regulations in 2022 that will make significant changes to how data is collected, stored, and processed.

Backing up your data

Do not be among the 30% of the people who haven't backed up their devices. Think of a data backup as the bedrock of your digital disaster recovery plan wherein you can already be one step ahead of any cyber threats that might result in data loss.

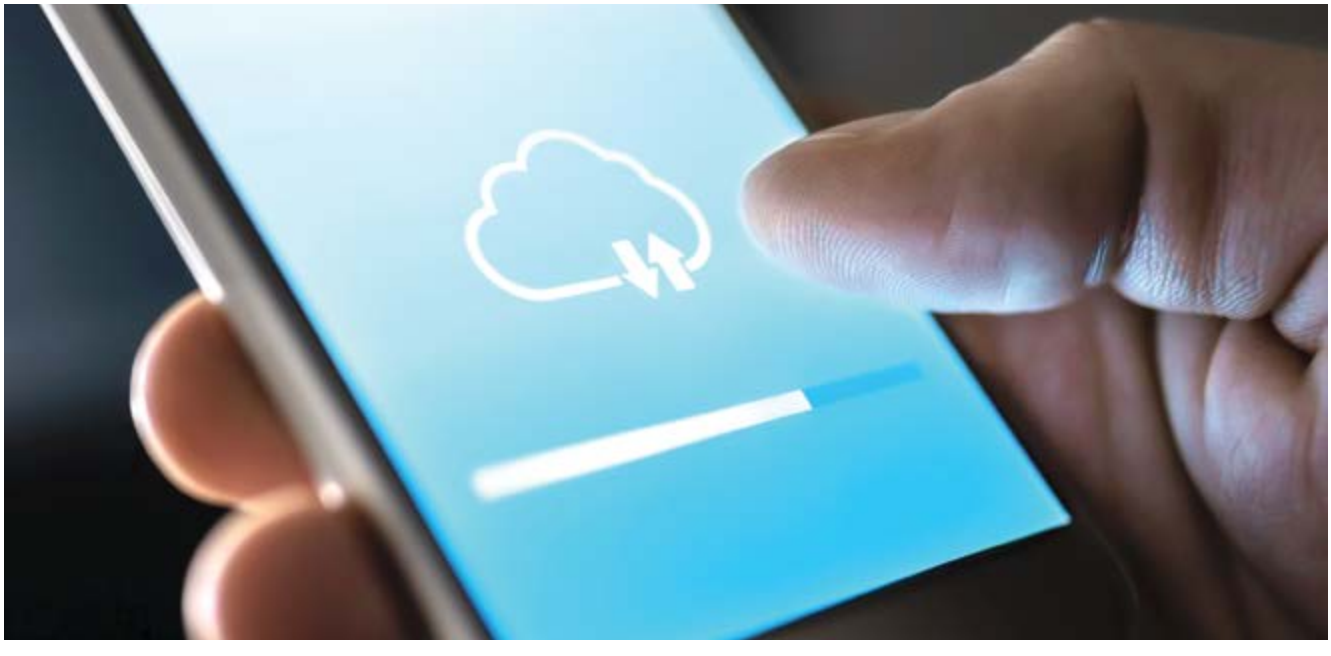
In choosing a data backup solution, individuals can learn how businesses develop their own data backup strategies and do this by considering the recovery point objectives (RPO) or the amount of time in between data backups and recovery time objectives (RTO) or the amount of time it takes to restore data.

There is no one-size-fits-all approach to data backup but you must opt for a solution that suits your needs. This can differ in setup mode, cost, storage space, and ease of access. Common means of data backup are removable media like USB flash drives, hard drives, and the cloud.

An easy way to remind yourself to backup is the 3-2-1 principle where you create three copies of your data on at least two separate storage solutions, with one of them being stored in a remote location. This strategy can help you get through any hardware or software failure, data corruption, or malicious attack.

Bear in mind to store the copies of important data on a separate medium to protect against primary data loss. For best results, it is essential to make backup copies on a consistent, regular basis to minimize the amount of data lost between backups. Remember that the longer you haven't made a backup, the more susceptible you are to fail in retrieving data.

If you have more digital data, get more backup storage to keep your files secure at all times. It is better to prepare for unexpected breaches or errors than to be regretful in being too late. Always be a mindful internet user to remain safe online. Limit the amount of data you share online and have a reliable data backup of files that you wish to access in the future. TR



How can CSPs put 5G to work?

5G, the new generation of mobile technology, is on track to become the dominant mobile access technology. It is expected to account for around 50% of all mobile subscriptions worldwide – covering 75% of the world's population and carrying 62% of the global smartphone traffic by 2027.

Conversely, new-age networks will need to handle hundreds of new applications and services for millions of users as 5G deployment rollouts grow. In fact, according to GSMA, 5G networks are likely to cover one-third of the world's population by 2025. Hence, the technology's impact on the mobile industry and its customers will be immense.

With its promise of greater speed, capacity, and low latency, 5G architecture will enable us to fully automate and provide better services to customers by giving operators the flexibility to respond to market demands while keeping costs in check. However, to be successful, 5G warrants multi-billion dollar infrastructure investments. Hence to benefit from 5G, CSPs need to develop cost-efficient strategies and embrace innovation to come up with a strong 5G business case by focusing on the different ways that can give them better return on investment (RoI) opportunities.

Nations opening up borders

As the world economy sets on a recovery mode post the pandemic, network readiness is no longer simply about deploying new technology, but building networks that create value for communities with a broader goal of achieving the UN's sustainable development goals of bringing people

and technology together. The recently published Network Readiness Index (NRI) report 'Shaping the Global Recovery: How digital technologies can help make the post-COVID world more equal,' revealed the world's most 'network ready' markets. On top, markets such as the US, Netherlands, Sweden, and Denmark have been ranked as the best followed by markets such as China and India.

To excel in a global economy, every nation must strive to keep up with the technological pace that is taking place. Hence, CSPs need to modernize their network infrastructure with the latest innovations keeping in mind the acceleration of 5G deployments to support regional digital efforts. Innovations such as network virtualization, API-based automation, integrating SD-WAN for various hybrid and multi-cloud services must be on every CSP's growth strategy.

For instance, developed around DevOps principles, Nokia's 5G Core will automate the lifecycle management of operators' networks, as well as enable continuous software delivery and integration. Moreover, with crucial monetization and operations functions such as network slicing, operators can unlock key revenue opportunities and benefit from increased operational efficiencies. During the COVID-19 pandemic, remote work requirements increased cloud-based solutions and gave way for the rapid adoption of cloud services. To keep up with this momentum, containers and microservices will witness greater implementation, making the generational shift to cloud much easier and more streamlined for organizations.

Big business customers

Over the next 5 to 10 years, more than 75% of CSPs expect half of their revenue to come from the B2B segment, according to analyst predictions. Hence, the potential to monetize 5G lies in B2B and B2B2X business models. 5G services in health sectors, governments, schools, and logistics are potential revenue-generating areas. CSPs can integrate public cloud services such as AWS Cloud WAN to create advanced WAN topologies with integrated network segmentation that aligns with their SD-WAN fabric to leverage the 5G benefits of low latency, increased capacity, and fast response delivery. Moreover, in 2022, AI and automation are expected to have dominated most positions in operations. CSPs will need to have an infrastructure that can facilitate this trend as seamlessly as possible and offer value-added services.

Portfolio expansion

CSPs should seriously consider making 5G services available for their other brands and plan types portfolio as more and more people embrace digital services. For instance, Etisalat Group recently acquired 100% of elGrocer – an online grocery delivery platform to support its digital services through their Smiles app to serve its customers by creating a diversified and integrated product portfolio. Furthermore, Etisalat also joined hands with Abu Dhabi-based artificial intelligence services provider G42 to merge their data centre services and create the UAE's largest data centre provider operating under Khazna Data Centers. With such collaboration, Etisalat is well poised to address the data storage and cloud infrastructure demands emerging in the UAE as well as globally.

Conversely, 5G technology calls for huge investment along with the scope of opportunities that may be too big for a single organization to handle. Therefore, fostering a partnership culture with other telcos or companies in other industries can prove to be rewarding. For example, recently Nokia and Ooredoo Group agreed to work together to bring multiple technologies and services, including 5G, as part of a multi-country, five-year deal. The deal, which builds on Nokia's global partnership with Ooredoo, is already underway and is expected to be completed by 2026.

Reaching the metaverse

Judging from the way things are advancing technologically, the emergence of a hyper-connected universe running on 5G has become realistically possible. No wonder, Nvidia, the world's biggest maker of AI chips and graphics has been strengthening its data center business as more internet companies invest in the metaverse –an online territory that connects people through augmented and virtual reality.

Moreover, 85% of companies are planning to use 5G for future IoT efforts, making IoT communications the most popular target use case for 5G. In this data-heavy traffic flow environment, the need for bigger bandwidth, tighter network security, and reliability are other areas where the 5G superiority is best suited for immersive technologies.

There is no doubt that 5G will have a role to play in every industry's digital transformation journey soon. Making services easy and quick whilst massively changing the customer experience will be an important KPI for organizations and businesses. CSPs can turn the 5G opportunity to work for them by adopting the right technology, monetization strategies, and future planning to build a competitive advantage with higher revenues and operating margins and steady customer growth. TR

Zain KSA approves SAR 3 billion tower deal with PIF-led consortium

Zain KSA's board of directors has approved the binding offer submitted by the Kingdom's Public Investment Fund (PIF) led consortium to acquire a 80% majority stake in the telco's 8,069 passive tower infrastructure for a value of SAR 3.026 billion (USD 807 million).

The consortium offer will see the PIF acquiring a 60% stake, Sultan Holding Company acquiring 10%, and Prince Saud bin Fahd bin Abdulaziz acquiring 10%. Zain KSA will own the remaining 20% stake, with the PIF having a call option to buy this remaining 20% for a specified amount.

Bader Al Kharafi, Zain vice chairman and Group CEO, and Zain KSA vice chairman, commented, "This transaction creates enormous shareholder value and gives Zain KSA greater financial muscle to invest in cutting-edge technologies and innovation that enhance the customer mobile and data experience. We congratulate the Kingdom's leadership, the PIF and regulatory authorities for their wisdom in creating an environment that raises the telecom sector to new heights in line with Saudi Vision 2030."

Zain KSA will sell its passive, physical towers infrastructure and retain all other wireless communication antennas, software, technology, and intellectual property with respect to managing its telecom network. This step will enhance the efforts of both Zain KSA and PIF to upgrade the Kingdom's ICT ecosystem, by maximizing the efficiency of the tower infrastructure through the combined expertise of Zain KSA and the PIF to enhance the sector's efficiency and financial feasibility.

Al Kharafi added, "The unlocking of capital to focus on higher yielding digital investments and optimization of infrastructure that creates internal efficiencies is a core element of Zain's transformational '4Sight' strategy, empowering Zain to enhance the meaningful connectivity we provide the communities, businesses and governments we serve. I also wish to recognize the concerted and joint efforts of the Zain KSA board of directors and the Zain Group and Zain KSA teams in finalizing this first of its kind transaction in KSA with the visionary PIF-led consortium."

Al Kharafi concluded that the proceeds of this sale will enhance the company's financial liquidity and profitability. The completion of this transaction in Saudi Arabia, follows similar pioneering tower deals Zain has completed in its operations in Kuwait and Jordan.

du reports 5.4% revenue growth in full-year 2021 results

Emirates Integrated Telecommunications Company PJSC ("EITC") announced its financial results for the year-ended 31 December 2021. Full-year revenues grew by 5.4% to AED 11.7 billion on sustained demand for broadband services and 5G handsets as well as a gradual recovery of mobile services.

Revenues in Q4 staged +12% growth driven by several commercial initiatives supported by improving market conditions. Full-year EBITDA grew by 1.9% to AED 4.6 billion reflecting revenue growth and cost saving initiatives. du notes the exceptional performance in Q4 as EBITDA increased by 20.5%. Net profit for the year reached AED 1.1 billion. In 2021, EITC invested a record amount of AED 2.6 billion as evidenced by the rapid 5G network roll-out. Despite the magnitude of investments, Operating Free Cash Flow (EBITDA – Capex) for the year remains strong at AED 2 billion.

On the basis of these results, the Board has recommended a dividend, for the year 2021, of 21 fils per share, out of which 10 fils per share were already paid as an interim dividend on 24 August 2021.

Mobile customer base grew by 8.9% year-over-year, ending the year with 7.3 million subscribers on record net-additions in Q4. This growth reflects the growth in postpaid customers as well as a significant increase in prepaid customers during Q4. Postpaid customer base grew to 1.3 million and prepaid customer base increased to 5.9 million subscribers as a result of the release of mobility restrictions (domestic and international) and higher tourist activity driven by Expo 2020.

Fixed customer base increased by an impressive 66% year-over-year, ending the year with 390,000 subscribers on another record net-additions in Q4. Customer base has grown consistently throughout each quarter, driven by commercial initiatives across various product categories and well-managed broadband strategy.

stc announces launch of new data center in Qassim

stc has announced the inauguration of a new data center in the Qassim region, on their social media pages.

Prince Faisal bin Mishaal bin Saud, governor of Qassim region, inaugurated the data center, which falls within phase two of the new generation of data centers in Saudi Arabia.

The data center, which spans over an area of 12,000 square meters, is expected to support the digital economy of the kingdom by strengthening the cloud infrastructure in the fields of data and artificial intelligence (AI), a state news agency reported.

stc CEO Olayan Alwetaid has said that the data center comes as part of the series of centers launched by the group across the Kingdom.

He said that the project will provide key digital availability areas that secure an integrated set of secure world-class services and service management, in addition to asset safety measures across major cities of Riyadh, Jeddah and Dammam and Buraydah.

He also pointed out that the group seeks, through these centers, to implement the largest data centers project in the Middle East, which targets converting the Kingdom into a global technology hub that technically connects the continents of Asia, Europe and Africa.

stc Data Centers program constitutes of 16 Data Centers that include 17,000 racks which will be incorporating 8 parallel projects distributed across multiple zones within 6 cities, makes this the biggest program of Data Center Construction at one time, across the region. The program will create critical digital availability zones that will provide a full range of services together with world-class security and service management as well as safety measures of asset's, across key cities such as Riyadh, Jeddah, and Dammam.

Ooredoo Group announced revenue of QAR 30 billion for FY 2021

Ooredoo Group announced its overall financial results for 2021. The company's financial highlights show positive growth across indicators, recording a solid full-year operational performance.

Ooredoo Group's revenue for the full year 2021 stood at QAR 30 billion, an increase of 4% compared to the same period last year. This is mainly driven by growth in Qatar, Indonesia, and Tunisia. Moreover, the Group's EBITDA for the period was QAR 13 billion with a corresponding EBITDA margin of 44%, driven by growth in Indonesia, improving macroeconomic conditions in Kuwait, and increased customer confidence in Algeria.

Free cash flow also increased by 30% to reach QAR 8.2 billion while the consolidated customer base at year-end exceeded 121 million due to strong performances in Indonesia, Oman, Algeria, and Iraq.

Ooredoo Qatar, the company's home market, continues to deliver strong results with growth in revenue of 6% to QAR 7.5 billion and a strong EBITDA margin of 52%. It delivered a robust performance in 2021, boosted by Qatar's strong economy, with total customer numbers at 3.2 million.

On the other hand, further roll-out of the 5G network combined with innovative new product offers had a positive impact on Ooredoo Kuwait's performance with a slight increase in revenue to QAR 2.5 billion. Furthermore, the company enhanced its 5G reach significantly by the end of 2021.

Along with this, Ooredoo Oman's customers increased by 2% as the company further invested in its digitalization efforts with the launch of an international money transfer service via its mobile money platform, Pay+, with a continued 5G rollout across the sultanate.

Reporting an annual revenue increase of 9% as per local currency terms, Asiacell was recognized as the best mobile network operator in Iraq after witnessing a significant increase in data consumption after extending its 4G coverage to 90% of the sites, launching 4G+, and increasing LTE-enabled sites in the network.

For the North African region, Ooredoo Algeria and Ooredoo Tunisia both reported top-line growth in local currency terms in 2021, of 8% and 6% respectively. Ooredoo Algeria's network site availability also stood at 99%, further improving the customer experience while Ooredoo Tunisia's customer base now stands at 6.9 million.

Indosat Ooredoo also had a stellar year, with double-digit growth in revenue and EBITDA. The company reported an increase in revenue to QAR 8.0 billion and an improved EBITDA margin of 49%, driven by cost optimization initiatives.

stc achieves positive overall 2021 results, revenue increased by 7.6%

stc announced its annual consolidated financial results for 2021. Financial highlights include total revenues reaching to SAR 63.4 billion, a YoY increase of 7.6%; the operating profit reaching to SAR 13.1 billion, a YoY increase of 3.1%; and EBITDA reaching SAR 22.8 billion, a YoY increase of 3.4%.

Commenting on these results, Eng. Olayan Mohammed Alwetaid, stc Group CEO, stated that the positive results achieved by the company for 2021 came in line with their expectations, as the company was able to grow its top line by 7.6% compared to the previous year.

This was driven by the strong performance witnessed in the enterprise business unit, which was able to grow its revenues by 20.9%, benefiting from the company's ability to accommodate the strong demand from the public and private sectors. The wholesale business unit also continued its positive contribution to the company's financial results, as it achieved a growth of 2.9%, thru leveraging stc's infrastructure investment.

The residential segment also achieved a growth in its revenues, with an increase of 10.5%, which supported the consumer business unit's financial performance. This is primarily due to an increase in FTTH and fixed wireless access subscribers by 10.3% and 21.7%, respectively. Moreover, the revenue growth witnessed in stc's subsidiaries also contributed positively to the company's financial results.

In line with Saudi Vision 2030, stc will continue its national role and contributions towards achieving the vision by investing in the digitization of the economy, strengthening its assets, diversifying its services, developing commercial and operational capabilities, and maintaining its ICT leadership in the region. In achieving its "DARE" strategy, the company will continue to invest in new business trends and execute its ambitious plans to expand in telecommunications and infrastructure, in addition to developing new platforms such as IoT, cloud, cybersecurity, data analytics, digital services and applications, data center hosting services, in addition to regional and international connectivity.

Mobily's 2021 revenue, net income highest since 2014

Etihad Etisalat Company (Mobily) delivers the highest top-and-bottom-line levels since 2014, reaching SAR 14.8 billion of revenues and 1.1 billion of net income in 2021.

Revenue increased by 5.6% YoY, driven by strong growth in the business and consumer segments, with the latter showing promising growth in fiber-to-the-home (FTTH). Mobily ended 2021 with the highest-ever revenue and gross margins as well as best cash collection performance in the business segment.

Furthermore, Mobily's net income increased by 36.8% YoY, predominantly owing to the solid growth in revenues in addition to a 10% YoY decrease in finance charges which reached SAR 505 million.

Commenting on the results, Eng. Salman Bin Abdulaziz Al Badran, chief executive officer at Mobily, said, "All sectors in Mobily showed significant performance in 2021, and as a result, Mobily was able to achieve significant operational successes and meet ambitious targets in line with our strategy of growing core sectors while optimizing efficient delivery of services and products. Highlights for the year included the digital enhancements, as well as a substantial increase in our FTTH customer segment."

EBITDA also represented a 4.6% YoY growth, recording SAR 5.6 billion, with the EBITDA margin reaching 37.7% compared to 38.1% last year. CAPEX significantly decreased by 25.1% YoY as well, reaching SAR 2.1 billion in 2021 due to the completion and achievement of strategic objectives. As a result, CAPEX/revenue stood at 14.1% in 2021 compared to 19.9% in 2020.

Mobily mostly focused its 2021 CAPEX toward the ongoing rollout of 5G, expanding fixed wireless access in 5G coverage areas which supported growth in the home segment revenue and customer base.

Operational cash flow also increased by 36.9% to reach SAR 3.5 billion due to the increase in EBITDA and decrease in CAPEX.

Khalid Abanami, chief finance officer at Mobily, added, "Thanks to our continued focus on effective cost management and streamlining efficiencies in areas including customer care, the launch of several enterprise projects, and expansion of 5G services, we were able to improve our performance and solidify our position as a leading telecommunications provider in the Kingdom."

Telecom Egypt and GRID Telecom sign a strategic MoU to connect Egypt and Greece

Telecom Egypt, Egypt's first integrated telecom operator and one of the largest subsea cables operators in the region, and GRID Telecom, subsidiary of the Independent Power Transmission Operator (IPTO) in Greece, signed a strategic Memorandum of Understanding (MoU) to connect Greece and Egypt using submarine cable infrastructure.

The MoU was signed at IPTO's headquarters in Athens by the Managing Director and CEO of Telecom Egypt, Mr. Adel Hamed and the Chairman and CEO of IPTO, Mr. Manos Manousakis. Present during the signing ceremony were Egypt's Minister of Telecommunications and Information Technology, Dr. Amr Talaat, Greece's Minister of Digital Governance, Mr. Kyriakos Pierrakakis, and the Chargé d' Affaires of the Embassy of Egypt in Athens, Mr. Mohamed Elghazawy.

The strategic agreement sets the ground for the exploration of different connectivity options between Greece and Egypt, as well as the optimal utilization of Telecom Egypt's and Grid Telecom's state-of-the-art networks and international reach, through their existing and future optical interconnectivity to neighboring countries.

Bilateral talks between the Ministers and high-ranking government officials of the two countries also took place during the signing ceremony, covering a number of topics, namely Artificial Intelligence, Innovation, and Entrepreneurship.

With a domestic fiber optic network currently exceeding 4,000 km, Grid Telecom, IPTO's vehicle in the telecommunications market, is already offering diverse fiber connectivity between the island of Crete and the Greek mainland, in addition to its network infrastructure in Italy, the Balkans, and Central Europe, leveraging its position as a major, carrier-neutral hub in Europe.

Telecom Egypt's international network extends to over 140 landing points in more than 60 countries across the globe. The company has invested extensively in its submarine cable infrastructure, which is the shortest and most reliable crossing path between Africa, Asia and Europe, making Telecom Egypt the partner-of-choice for many international telecom players over the years. Additionally, Telecom Egypt is working on multiple layers of its infrastructure diversity, such as establishing new submarine landing stations and crossing routes as well as investing in new systems and solutions that will cater for the rising global demand for international capacities.

e& 2021 consolidated revenue hits AED 53.3 billion, 3.2% YoY increase

e&, previously Etisalat Group, announced its consolidated financial results for the full year 2021. 3.2% YoY increase was observed across its consolidated net profit, revenue, and earnings per share, with increased foreign ownership limit in share capital from 20% to 49%.

Consolidated revenues for e& increased by 3.2% to AED 53.3 billion, while consolidated net profit rose to AED 9.3 billion, also representing a 3.2% YoY increase. Consolidated EBITDA amounted to AED 26.7 billion, representing a YoY increase of 1% and resulting in EBITDA margin of 50%.

During 2021, the Etisalat UAE subscriber base reached 12.7 million subscribers, while aggregated subscriber base reached 159 million, representing a YoY increase of 3%. Moreover, a total dividend of AED 0.8 per share was represented for FY 2021.

With organisations and individuals fundamentally changing the way they conduct business, e& is determined to stay agile and fit for the future in bridging the gap between the telecom industry and what customers need in the digital space. Looking ahead to 2022, e& aims to remain well-positioned to continually create innovative propositions.

Hatem Dowidar, chief executive officer of e&, added, "This has been an exceptional year during which we have witnessed robust financial performance and business growth across our operations. I am particularly proud of our performance set against the backdrop of another challenging year as we continued to navigate through the effects of the COVID-19 pandemic. Our domestic and international operations delivered a strong performance over the course of the year as a result of our continuous focus on maintaining growth.

"Thanks to our customers and shareholders for their continued support of our business and vision as we move forward with our mission to pioneer broad-spectrum technologies, build breakthrough partnerships and uncover opportunities that will empower the future," Dowidar concluded.

AI innovation at the Edge

Significant investments are being made around distributed edge technologies and in moving the network and compute platforms near to the consumer of the applications as the enterprise and consumer business demands bigger and better service and experience.

The inflow of data on networks has become a determinant factor in how successful businesses extract valuable business insight and support real-time control over critical business processes and operations. Huge amounts of data are regularly collected from sensors and IoT devices operating in real-time from remote locations and even unreceptive operating environments. Hence, agility and stability around the edge connectivity are becoming extremely important.

In edge computing, some percentage of storage and compute resources are processed outside the central

data center and closer to where the actual data is generated – retail stores, factories, utility farms, or smart cities – hence the process becomes faster with reduced latency. However, data that is less time-sensitive can be sent to the main data center for review and other manual updates.

This is where AI/ML technology is helping developers create better and lower-cost IoT end nodes that will enhance the network's intelligence where data exchange is taking place. The sheer computing efficiency of AI/ML gives a whole new meaning to good decision-making in the end node and adds value through optimizations for all stakeholders, including the consumer, the developer, and the operator.

"Another area we're watching is innovation in AI at the edge. AI is a horizontal technology, but it's especially important at the edge because part of the edge is about bringing processing power closer to the customer, whether that's automated factories, self-driving cars, or retail and business analytics. New infrastructure is going to create all sorts of opportunities of the edge, especially the far edge, " says Scott Raynovich, founder & principal analyst with independent consulting firm Futuriom.

Recent ABI research findings show that the edge AI ecosystem market – comprising of edge AI chipset suppliers, development platforms, turnkey service providers, and Software-as-a-Service (SaaS) companies, is expected to grow 3 folds in the next five years. Estimated to be a US$15 billion market in 2021, the market is expected to grow close to US$45 billion by 2027.

AI Edge uses cases

It is not surprising to know why the AI Edge market is growing. For instance, cloud giant Google is experimenting with AI to tackle the menace of spam calls through its Call Screen feature to Pixel devices. The upgraded feature uses edge AI – advanced language processing capability on the smartphone, rather than on a server in the cloud to intercept and answer suspected spam calls without bothering the user with a little help from Google assistant. Despite a few misfires, the overall proposition could have a long line of takers.

Moreover, the AI Edge already promises a long list of ubiquitous purposes. When it comes to security, the technology allows CCTV cameras to process facial recognition analysis without having to connect to a server and thus delivering a faster and accurate facial recognition minus the chances of data abuse or interception. In addition, they (cameras) can also detect suspicious movements and send alerts to the security team thus increasing greater visibility and efficiency.

Another vertical where AI Edge is gaining acceptance is the automobiles sector. Both self-driving and traditional cars are increasingly using AI for automated driving assist system functions such as blind-spot detection and rear collision prevention. AI Edge allows vehicles to access such functions even in unreceptive areas such as tunnels and basements.

Future of AI Edge

UAE's Ministry of Industry and Advanced Technology (MoIT) has regarded technological solutions and fourth industrial revolution applications as its key focus area. The Fourth Industrial Revolution Program (UAE Industry 4.0), the region's first integrated program to support manufacturers in the adoption of 4IR technologies has already been launched. Moreover, the ministry has collaborated with international companies to promote the deployment of advanced technology, as well as with the governments of Spain, France and Israel to name a few. To improve the national R&D ecosystem, the Cabinet has approved the research and development governance policy. And in partnership with the Emirates Development Bank, the ministry has launched an AED5 billion financing program for the next five years, to support projects aimed at accelerating advanced technology adoption. In 2021, AED248 million (US$67.5 million) was granted to finance such projects. Advancement and innovation in technologies, adoption of 5G solutions, and rising demand for electric vehicles and smart cities are expected to drive the AI Edge market further.

Considering such developments in the 4.0 industry, the 5G coverage of a nation plays a critical role in supporting low latency and low cost 5G uses cases. Telcos must consider the proliferation of IoT devices in the home and industry settings, the adoption of virtualized networks, and the online content consumption appetite of consumers in the 5G environment. Investing in innovative technologies as well as edge data centers to act as intermediary servers to reduce latency, overcome intermittent connections and store and compute data close to the end-user is a strategy that each telecommunication company must incorporate to benefit from the hitherto untapped business opportunities lying deep in the AI Edge universe. TR

Edge AI ecosystem market, comprising of edge AI chipset suppliers, development platforms, turnkey service providers, and SaaS companies, is expected to grow 3 folds in the next five years

Witnessing connectivity unleashed during MWC22

Mobile World Congress (MWC) has taken place once again in Fira Barcelona for a momentous gathering of the global connectivity ecosystem. Over 61,000 physical attendees were present at MWC Barcelona in 2022 from almost 200 countries, and Telecom Review is among the international media on-site that showcased connectivity unleashed and how it shapes the ICT industry and society as a whole.

As a dynamic place where business gets done, the Telecom Review team secured exclusive interviews and attended private meetings and discussions during MWC22 with leading telecom and ICT players and governmental entites.

Empowering digital: 5G and connectivity

In MWC 2022, Huawei presented what's driving innovation in digital infrastructure. This theme refers to all the digital opportunities that Huawei is bringing to every person, home, and organization for a fully connected, intelligent world. "This year at Mobile World Congress 2022, I can think of no better opportunity to re-emphasize this vision and extend it to our view

for the future world of 2030," said Simon Lin, president, Huawei Asia Pacific. For Huawei's Simon Lin, the future world at 2030 will impact every aspect of life, industry, society, and economy.

Lucky La Riccia, vice president and head of digital services at Ericsson MEA, also stated that MWC is a great showcase of the leading telecom vendor's digitalization efforts. "Our aim is to help service providers to execute a digital transformation that transforms both enterprises and industries, by introducing leading-edge technologies such as AI and 5G as a network enabler and platform for innovation."

In B-Yond's case, promoting ML-Infused 5G in line with the event displays how 5G is an inflection point for them. Ned Taleb, CEO of B-YOND explained, "We see a lot more demands with this technology. There is definitely a race… so, shortening the cycle of the introduction of 5G is very important." B-Yond has trained models, with a big part of the success is having access to data.

Understanding MWC22 theme "Connectivity unleashed" as a mission statement to support the expansion of modern digital infrastructures, Ralf Pitchler, CEO, Detecon added, "It's not so much about unleashing something connectivity related yet as it is about preparing for a new kind of technology landscape that requires telcos, hyperscalers and governments to adapt to a changing playing field."

Kamal Mokrani, global vice president, Infinet Wireless, proudly claimed that they exist to provide connectivity. Hence, with regards to the event's theme, "For us, it has been unleashed in 1993 when we set up the company. Yet, with the huge growth in connectivity and the traditional solutions like fiber optics and even satellites to some extent, these simply cannot cope with the demand." As a business, the pandemic has allowed Infinet to grow much faster than they had anticipated because of the need to provide connectivity as soon as possible, on a large scale.

In terms of contributing to improving connectivity, Doug Suttles, co-founder and CEO of Ookla said, "We are a brand known worldwide. The fact that we measure everywhere and are trusted by the consumer makes us be the ideal provider of insights to operators around the world. We know where networks exist, how they perform, whether operators themselves are using the platform for business reasons, or if it is regulators trying to look, see, and ensure that all of their population is able to get good internet connectivity. We are the ultimate source for that information."

Telcos await MWC every year to announce new partnerships. Zain KSA has announced a Memorandum of Understanding (MoU) with Nokia. The MoU aims to carry out preliminary collaboration plans in the sustainable development of the infrastructure network by upgrading it with advanced 5G technology capabilities to roll out innovative solutions and services that can benefit businesses as well as individuals.

Similarly, Ericsson and stc have signed a Memorandum of Understanding (MoU) at Mobile World Congress 2022 to explore 5G capabilities and to strengthen stc's 5G network indoor coverage and performance.

Telecom and digital economy

On the other hand, valuable insights from C-level executives have been gained. Following his recent appointment as Group regional CEO of Ooredoo, Ahmad Al-Neama also articulated that the telecoms market in the MEA region will still be centered on mobile services. "The telecommunications sector in the region proved to be very resilient during the pandemic and actually achieved growth due to the increased demand for broadband and mobile services. 5G speeds and enhanced network quality will be at the center of the competition in the region. 5G service take up will definitely accelerate with new 5G plans and 5G devices being launched."

Lebanese minister of telecommunications HE Johnny Corm was also present at this year's MWC at a gathering hosted at the stand of MobiMind. The minister discussed with the attendees the status of the telecommunications sector in Lebanon and the challenges that the ministry is facing. HE called upon the Lebanese ICT diaspora to "work hand in hand in order to overcome the current challenges."

Namal Rajapaksa, state minister of digital technology and enterprise development at Sri Lanka, remarked that it is very much needed to understand the changes that take place in technology and how better we can use it for citizen services. Being at MWC22, he told Telecom Review, "This will enable us to understand the best practices in the industry in order to implement the necessary changes to the administration systems and citizen services and see how we can enable the digital economy in our country." TR

> Over 61,000 physical attendees were present at MWC Barcelona in 2022 from almost 200 countries

Cloud region soon in Saudi Arabia, says Huawei's Guo Ping

Speaking to attendees at LEAP 2022 technology innovation conference, Huawei's rotating chairman Mr. Guo Ping said that Huawei would soon build a cloud region in Saudi Arabia. The hosting of the Huawei cloud region in the Middle East will boost local businesses and governments' ability to access more robust and secure cloud services from Huawei.

The new cloud region will create new social and economic value in Saudi Arabia and the wider Middle East in line with their digital development strategies. Guo noted Saudi Arabia has already confirmed plans to become one of the world's top 20 tech economies and in turn diversify its national industries.

"Going digital is now a key global consensus," noted Guo. "Over the past three years alone, many global enterprises have fully embraced digitalization, with the top 10% of these organizations growing their revenue as much as five times faster than those who have not embraced digitalization. Huawei's own customers, partners, and developers can rely on our services to help industries in the region go digital."

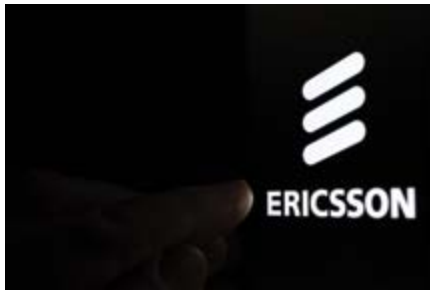
The rotating chairman's participation in the inaugural LEAP conference shows Huawei's commitment to participate in and help the digital transformation in Saudi Arabia and the Middle East. Huawei is already an active contributor in Saudi's digital transformation process, Ping highlighted, as the company has helped local carriers connect over 5.5 million people in remote areas.

For the past 17 years, the company has assured stable Saudi telecom networks during major national events such as the Hajj that demands high quality networks. Huawei also worked with industry leaders like Aramco on intelligent oil field operations.

Huawei has also pledged to cultivate talent for the regional AI industry. In Saudi Arabia, Guo noted that Huawei would support the Kingdom's effort to become one of the first countries to have a large-scale AI model. According to Guo, this will help the country build more intelligent platforms in domains like Arabic-language identification, pharmaceutical R&D, disease detection, and many others.

LEAP is being held for the first time in Saudi Arabia from February 1-3, bringing together leading technology corporations, inspiring start-up founders, and venture capitalists to discuss opportunities and potential in the digital economy. Huawei has a significant presence at LEAP bringing its diverse ICT capabilities together for attendees to explore.

Ericsson provides plug-and-play access to cellular IoT connectivity



Ericsson launches the IoT Accelerator Connect to deliver a reliable and secure cellular IoT platform that empowers communications service providers (CSPs) and enterprises worldwide in scaling their IoT business across millions of devices.

Kyle Okamoto, general manager of IoT, Ericsson, says, "We're proud to make it easier than ever before for enterprises of any size to instantly engage with, and benefit from, the world of IoT connectivity. By offering plug-and-play simplicity, Ericsson IoT Accelerator Connect marks a major leap in transforming access to IoT connectivity. This solution covers connectivity of devices, networks, and clouds while removing hurdles for enterprises, communications service providers, hyperscale cloud providers, resellers, and module vendors, to accelerate the growth of their IoT businesses."

For enterprises, the IoT Accelerator Connect delivers a unifying layer of packaged services to minimize complexity while developers have instant access to connectivity that is best suited to their specific use case, coverage, and service level needs, as well as access to automated bootstrapping of both devices and data destinations.

As a result, devices can be connected at any time, including end-to-end device onboarding, with a cellular IoT-ready module instantly connecting the subscription to the customer's network of choice. In addition, the solution makes it easier to connect devices to public cloud endpoints.

Overall, the IoT Accelerator Connect advances digital transformation throughout the IoT ecosystem, allowing Ericsson channel partners to onboard more enterprises with greater ease and grow their business.

Huawei, Saudi Digital Academy to nurture future digital talent

The Saudi Digital Academy (SDA) has signed a memorandum of understanding with Huawei to cooperate in developing local talent within the technology domain, supporting the Kingdom's digitization goals outlined in Vision 2030.

Held during LEAP 2022, the MoU was signed between SDA CEO Mohammed Alsuhaim and deputy CEO of Huawei in Saudi Arabia Steven Liu, in the presence of HE Eng. Haytham AlOhali, vice minister of communications and information technology, Eng. Faris AlSaqabi, deputy minister for future jobs and capabilities, Shunli Wang, vice president of Huawei Middle East, and Eric Yang, CEO of Huawei.

The two organizations will work together on the launch of new projects within the Huawei ICT academy program that involves building a talent supply chain covering the entire process of learning, certification, and talent promotion. Through such projects, SDA and Huawei aim to support 8,000 Saudi trainees through the Huawei ICT certification program. The two parties will also collaborate in upcoming editions of Huawei's annual Middle East ICT competition, which in 2021 was run in partnership with the Saudi Ministry of Communications and Information Technology (MCIT). SDA and Huawei further plan to collaborate in supporting the 'Attaa Digital' initiative, empowered by MCIT, including the delivery of trainings for Huawei HMS developers in the Kingdom.

Eric Yang, CEO of Huawei Tech Investment Saudi Arabia, said, "Local talent is constantly required to drive digital transformation on a national level. Through partnerships like this with the Saudi Digital Academy, we are able to create an even stronger digital ecosystem that serves both recent graduates and ICT professionals, contributing towards the progress of Saudi Arabia's Vision 2030 which places a strong emphasis on the potential of the ICT sector."

Expanding its own capabilities, SDA will engage Huawei in a variety of knowledge-sharing activities. The latest memorandum outlines plans for Huawei to train and certify 100 Saudi trainers from SDA through its Huawei Train the Trainer (TTT) program, focusing on areas such as AI, cloud, security, data center and 5G. Huawei will also conduct a digital leadership camp for SDA and MCIT leaders.

In the area of job creation, SDA and Huawei have also confirmed an ambition to host a joint ICT job fair by the end of 2022 that expands opportunities for local talent in the Kingdom.

Mohamad Alsuhaim, CEO of Saudi Digital Academy, said, "SDA has a legacy of working with prestigious academic institutions and private sector leaders in the development of its programs. This memorandum with Huawei will open up new opportunities for Saudi digital talent to both develop cutting-edge skills and to be leaders of the future digital economy."

CommScope's FY 2021 core net sales surge by 11.8%

CommScope shared its full-year 2021 results, indicating strong performance during Q4 in outdoor wireless networks (26.9%) and venue and campus networks (24%).

For FY 2021, the core net sales of CommScope amounted to $6.7 billion. These core financial measures reflect the results of the broadband networks, outdoor wireless networks, and venue and campus networks segments.

Zooming in to last year's period (Q4 2021), the outdoor wireless networks net sales reached $374 million, primarily driven by growth in macro tower solutions while the venue and campus networks net sales stood at $591 million driven by growth in all product lines including indoor copper enterprise, indoor fiber enterprise, RUCKUS networks, DAS and small cell.

Net sales of $782.4 million, increased by 0.5% from the prior-year period, are recorded for the broadband networks segment, driven by growth in network cable and connectivity, and partially offset by declines in access technologies.

Chuck Treadway, president and CEO, CommScope, said, "We expect to see continued improvement from the first quarter and confirm that we still anticipate our 2022 Core Adjusted EBITDA to be within the range of $1.15 billion to $1.25 billion, as presented at our Strategic Transformation Update in December."

In 2022, the company will reorganize its business structure to align its portfolio of products and solutions more closely with the markets it serves and bring better performance clarity. These will possibly include connectivity and cable solutions; access network solutions; networking, intelligent cellular, and security solutions; outdoor wireless networks; and home networks.

As per CommScope's results, the company ended 2021 with $360.3 million in cash and cash equivalents.

Latest Nokia SaaS services revealed

Nokia announced two new software-as-a-service (SaaS) services in the areas of security and analytics, as part of its strategy to give communication service providers (CSPs) and enterprises a more flexible and cost-effective way for servicing their customers, and operating and monetizing their networks, as advanced 5G services are rolled out.

Raghav Sahgal, president of cloud and network services at Nokia, said, "Adopting Nokia AVA NWDAF and iSIM Secure Connect through the SaaS model will greatly improve the time-to-value that CSPs and enterprises can realize by having on-demand access to services. These latest Nokia SaaS services strengthen our leadership position in helping our customers change the very foundation of how our industry does business."

The new services follow Nokia's recent launch into SaaS to help CSPs and enterprises accelerate the time to value they realize from their services offerings by shifting to an agile model based on software consumed purely on demand through a subscription, and away from customized software run on costly, complex, on-premise infrastructure.

Nokia's iSIM Secure Connect

Nokia's iSIM Secure Connect, through a SaaS delivery model, enables CSPs and enterprises to securely manage machine-to-machine and consumer device subscriptions for eSIM- and iSIM-enabled devices.

As opposed to classic SIMs, embedded SIM (eSIM) and integrated SIM (iSIM) technologies can store and manage multiple subscription profiles remotely for authenticating users and devices on mobile networks. iSIM Secure Connect gives control to automate the entire eSIM/iSIM management process and will open opportunities to monetize services linked to trusted digital identities.

It is expected to be available as SaaS later this year, and will still be offered to customers in other deployment models.

Nokia AVA NWDAF

As 5G network complexity has increased the need for advanced analytics, Nokia is strengthening its AVA offering with new SaaS capabilities based on network data analytics function (NWDAF), part of 5G standalone architecture.

Nokia AVA NWDAF enhances network operations with AI/ML-driven closed-loop automation, improves customer experience, and drives new sources of revenue. With its distributed architecture and open APIs, AVA NWDAF helps CSPs provide analytics at the network edge; implement analytics services defined by 3GPP; and create partnerships with software developers.

AVA NWDAF will be commercially available in a SaaS delivery model later this quarter.

Ericsson, Mobily expand their 5G partnership in KSA

Ericsson and Mobily have signed a memorandum of understanding (MoU) to expand the cutting-edge 5G use cases for use in different industries in Kingdom of Saudi Arabia.

Ericsson Private 5G offers secure and simple 4G LTE and 5G standalone (SA) connectivity, that optimizes and simplifies business operations with cloud-based network management portal and a troubleshooting application, built to meet enterprise information technology (IT) and operation technology (OT) users' self-management needs, while keeping sensitive data safe on site. Having zero downtime upgrades and keeping sensitive data on-premise, Ericsson's private network will provide high-performance through service-level agreements (SLAs).

Being an easy to install and flexible network, supporting a range of deployment sizes, Ericsson Private 5G will support innovative use cases across a range of industrial sectors including manufacturing, mining, ports, and airports, as well as oil and gas and power utilities.

Eng. Alaa Malki, chief technology officer at Mobily says, "Our collaboration with Ericsson reaffirms our commitment to positively contribute to Saudi Arabia's digital transformation journey. By exploring innovative use cases across several industries in Saudi Arabia, we will not only help unlock growth opportunities for public and private sector enterprises in the Kingdom but will also propel the nation towards achieving its digital transformation ambitions in line with Saudi Vision 2030."

The Ericsson Private 5G builds upon Ericsson's 4G/5G radio and dual-mode core technology and will accelerate the digitalization journey across multiple industries. Use cases range from tracking assets, real-time automation to enhanced productivity, optimizing business operations through digital twins and data driven insights, performing better site inspections or remote controlled robotics to increase worker safety, and leveraging the capabilities of digital technologies such as augmented reality to enhance worker capabilities.

Ericsson's updated 5G portfolio is all about energy efficiency

Ericsson has announced new radio access network (RAN) portfolio additions for 5G that promises to deliver substantial energy savings and up to ten-fold capacity increases – with minimal or no added footprint.

Leading the portfolio enhancements is Radio 4490, a dual-band radio that delivers 25% lower power consumption and lesser weight compared to the current product. This radio type is compatible with most of the radio sites globally as it supports the main FDD (Frequency Division Duplex) bands being used by many service providers for their 5G deployment.

Ericsson is also launching a high-power version of the new dual-band radio, 4490 HP, which enables up to 50% more output power compared to current radios. The two new radios apply passive cooling – reducing power consumption further, as fans are not needed. They are also Cloud RAN-ready.

Per Narvinger, head of product area networks, Ericsson, said, "We continue to evolve our RAN portfolio with more solutions for smart, slim, and sustainable 5G networks. Our latest innovations will further optimize 5G sites for both purpose-built and Cloud RAN deployments."

5G rollouts are accelerating across the world, with frontrunners gearing up for the shift to 5G Standalone to drive new consumer and enterprise use cases. Introducing 5G means added spectrum and hardware – which is where Ericsson's new products play a key role through the ability to raise capacity while slashing power usage – fueling efforts to break the energy curve.

The portfolio additions also include:

- Easy-to-install 64T/R Massive MIMO AIR 6428 for mid-band, with 400MHz bandwidth for efficient RAN sharing, in a single-person-carry 25kg radio.
- Highly integrated, multi-band Antenna 4602 – only 398mm wide, designed for best wind load durability and for maintained site build requirements.
- Next-generation Interleaved AIR 3218 with industry-leading low height and weight, enabling Massive MIMO rollouts without growing visual antenna footprint.
- Expanded Deep Sleep mode software for new radios and Massive MIMO portfolios. Consumes up to 70% less power per radio during low traffic hours.
- Coverage Boost is a versatile 5G carrier aggregation software that delivers 60% wider reach for mid-band TDD (Time Division Duplex) compared to dual connectivity. It supports RAN Compute and Cloud RAN platforms.
- The new products are powered by next-generation Ericsson Silicon, with its footprint-reducing, less power-consuming multi-band, and wide-band capabilities for remote and Massive MIMO radios.

Nokia helps CSPs leverage intelligence in their networks

Nokia announced two new managed services offerings to help communication service providers (CSPs) deliver a better customer experience and realize faster returns on their 5G investments by better utilizing intelligence from their network data.

Operations Transformation is a multi-year service with a focus on guiding CSPs to enhance the productivity and agility of their operations through cloudification and automation while Operations Intelligence, which uses AI driven analytics using massive datasets to precisely pinpoint issues, has the end goal of enabling CSPs to increase business outcomes like net promoter scores (NPS) and returns on their 5G investments.

Friedrich Trawoeger, senior vice president, cloud and cognitive services at Nokia, said, "We know that customer expectations have changed so our focus with these new services is to help CSPs realize business outcomes leveraging the intelligence in their networks. The methodology can follow our customers' unique digital transformation journey. In addition, the catalog approach is another step in our strategy towards providing a complete Software as a service (SaaS) portfolio."

Both services follow a methodology where modular operations services focus on the biggest improvement areas. The method is designed to follow a CSP's unique digital transformation journey and deliver tangible results in an outcome-based business model, giving flexibility and control. The micro-operations services catalog includes use cases ranging from coverage and capacity optimization to predictive analysis of anomalies in complex network settings in order to prevent the degradation of customer services and leverages Nokia AVA's AI use case library.

Nokia has been delivering commercial projects for the new two services with various CSP customers that have already started to yield solid results, including some CSPs in the Asia Pacific and Africa which have been able to reach the leading position in customer NPS and network performance. In other cases, CSPs have been able to keep their operating costs flat despite seeing network growth increase 50%, while also achieving higher network availability with 60% less variance in performance.

The new services coincide with the release of new Nokia-commissioned research, based on a survey of around 50 CSPs globally, which shows that most CSPs value their operations partners' support in their digital transformation.

Why Wi-Fi 6E will enable ultimate end-user experience?

Given the growing demand to connect more devices to the network, the importance of wireless connectivity in future communication networks will factor in prominently with emphasis on high data rates, low latency, and high security. Conversely, the plausible adoption of hybrid work settings with free-flowing video conferencing, shift towards cloud operations, use of mobile apps and cybersecurity concerns will inevitably require innovative technologies such as Wi-Fi 6E to solve the major challenges of future 5G networks.

Wi-Fi 6 was the latest and fastest version of Wi-Fi until around 2019, when it was superseded by Wi-Fi 6E, promising to take Wi-Fi 6 connectivity to a whole new level. Wi-Fi 6E is the new wireless standard that expands network capacity by making a larger amount of RF spectrum available in the 6 GHz range to add to the existing 2.4 GHz and 5 GHz bands. 6 GHz band offers lightning-fast wireless broadband speeds (up to 10 Gbps), ultra-low latency access (sub 2 sec), and supports all evolving applications including 8K video streaming, AR/VR, robotics, industrial IoT, network edge computing, etc.

What made Wi-Fi 6 faster?

Two key technologies namely MU-MIMO and OFDMA were responsible for the speedy Wi-Fi 6 connections. MU-MIMO stands for 'multi-user, multiple-input, multiple output' which allows a router to communicate with multiple devices simultaneously. Wi-Fi 6 allowed up to eight devices to communicate at one go. OFDMA, which stands for 'orthogonal frequency division multiple access,' allows one transmission to deliver data to multiple devices at once to get more out of every transmission that carries a Wi-Fi signal from a router to a device. "All of these features were critical for Wi-Fi 6. Obviously, for the Wi-Fi 6E, the underlying technology is the same but Wi-Fi 6E is enabled by the availability of 6Hz as well as 1200 MHz bandwidth," says Detlef Fuehrer, senior manager, spectrum management and regulatory affairs, EMEA, HPE.

Wi-Fi 6 and Wi-Fi 6E improve bandwidth and security and also offer an enormous increase in data rates and a significant reduction of latency.

What makes Wi-Fi 6E different?

The 'E' in the Wi-Fi6E stands for extended. This technology uses the 6 GHz spectrum with a total of 1200 MHz of bandwidth, greatly increasing capacity as it operates in a spectrum range free of interference from devices like Bluetooth speakers, cordless phones, and microwaves. While Wi-Fi 5 and Wi-Fi 6 can assign a total of three 160 MHz channels, two of the channels require dynamic frequency selection (DFS) due to the overlap with other services such as radars. However, Wi-Fi 6E allows a total of seven 160 MHz channels minus the interference, thus improving latency. It is going to be better in spectrally noisy

areas where a lot of Wi-Fi signals are bouncing with several access points and routers, for example, residential buildings, public venues, and office areas connecting to the same Wi-Fi hotspots. Additionally, the spectrum capacity enabled by 6E will allow more space for Wi-Fi channels.

Ideal compatibility

With the potential capabilities of 5G to deliver advanced and time-sensitive services at scale, along with a growing demand for mobile applications, communications service providers (CSPs) now have a great opportunity to take the customer experiences to the next level.

With numerous 160 MHz channels in the 6 GHz band, Wi-Fi 6E delivers the fastest Wi-Fi yet enabling multi-gigabit low latency connections. These high throughput connections are essential to supporting 5G services and enabling key use cases. Commercially, utilizing 6 GHz for 5G deployment is also foreseen as more viable because of lower capex and opex costs.

Multi-gigabit Wi-Fi venue capacity: The gaming sector has become a force to reckon with. Most of these games based on AR and VR require multi-gigabit speeds to operate in full capacity. Not only in gaming but sectors such as marketing, banking and retail, the use of AR and VR technologies are becoming important to provide a seamless customer experience. Such organizational operations have to be supported by Wi-Fi 6E connectivity for optimum results. Conversely, organizations can use virtual reality to train employees or medical students can learn operative techniques using VR glasses, etc.

Indoors gigabit coverage: Wi-Fi 6E will enable a more precise Wi-Fi location indoors, where GPS location is weak or unavailable. Applications such as asset tracking, emergency services, and keyless entry can seamlessly run on this connectivity. It will also enable applications such as aisle-to-shelf routing in stores where one can get to the exact shelf where the required product is located using smartphones or with AR glasses in the future. Additionally, Wi-Fi 6E can enable bandwidth-hungry devices of students on campuses to work flawlessly for a more immersive virtual learning experience.

High-speed tethering: Sectors such as healthcare, logistics and banking, etc. cannot afford to operate with latency issues on networks. The extra band in Wi-Fi 6E enables and supports mobility within crowded urban areas as well as data-intensive services and telemedicine.

Low-latency Wi-Fi calling: Wi-Fi 6E will also leverage important peer-to-peer Wi-Fi technologies to improve client-to-client communications. Activities such as sharing 8K videos with contacts, fast transfers for unified communications across various devices, both in the workplace and at home.

Early adopters

The UAE became the first nation in the Middle East and fifth internationally after USA, South Korea, Chile and the UK to allocate 6 GHz spectrum for the unlicensed public use. Recently, Saudi Arabia's telecom regulator CITC made 1200 MHz spectrum available on the 6GHz band for Wi-Fi. This new regulation puts Saudi Arabia on top of Europe, Middle East, and Africa region to release the full 6 GHz and lead the world in total availability of the mid-band license-exempt spectrum. The contribution of Wi-Fi technologies to the Kingdom's GDP is expected to quadruple, rising from $4.7 billion in 2021 to more than $18 billion by 2030."

According to the Wi-Fi Alliance, an industry-backed group that oversees the implementation of Wi-Fi, more than 41 countries worldwide have already designated 6 GHz for unlicensed use, while many more are actively working to open up the band.

In the post-pandemic world with work from home (WFH) environment being the norm and critical for business continuity, connectivity has to be optimized at all cost and the capabilities of Wi-Fi 6E are poised to kick in that ubiquitous connectivity.

"Mid-band spectrum is very important in the on-going digital evolution as it strikes a good technical trade-off between coverage and capacity to make 5G compelling," says Scott Minehane, an international regulatory and strategy consultant who extends advisory to governments, leading corporates and international organizations including the International Telecommunications Union (ITU) and the GSMA on telecommunications matters.

In his published paper entitled 'Optimising IMT and Wi-Fi mid-band spectrum allocation: The compelling case for 6 GHz band partitioning in Asia-Pacific', Minehane urges policymakers, regulators, and mobile network operators (MNOs) to allocate adequate mid-band spectrum for both IMT and Wi-Fi services.

Today, operators are offloading 4G/5G to super-fast Wi-Fi 6 networks with standards like WBA OpenRoaming becoming more mainstream. Wi-Fi 6E can open up a new level of performance with adequate spectrum and capacity for online operations with tremendous increase in live streaming activities as well as events online.

Since the FCC certified the first Wi-Fi 6E device – a low-power indoor transmitter from Broadcom, by end of 2021, there were 160 Wi-Fi devices and routers supported Wi-F 6E technology, according to Intel, who is closely monitoring the Wi-Fi technology development. These devices include laptop PCs, desktop PCs, PC motherboards, phones, routers, gateways, enterprise APs, and TVs. It is estimated that new releases of such devices during CES 2022 may now put the number closer to 200 types and models. As more and more Wi-Fi devices become ubiquitous along with the use of IoT, there will be massive crowding of the wave and Wi-Fi 6E will be at the center of the transitioning into a new era of next-generation wireless networking. WiFi 6e also paves the way for Wi-Fi 7, the next generation of WiFi. TR

Upcoming tech drivers for CSPs

The role of communication service providers (CSPs) in today's world has never been more dynamic and important. From strategic collaborations to the latest technological integration, the scope of innovation for CSPs to maximize connectivity, reduce network complexity, and achieve sustainable commercial success seems unlikely to end anytime soon. Moreover, as governments and enterprises step up their push towards providing 5G-driven digital services to citizens and customers, CSPs must explore new areas of opportunity and ideally be in a position where they can predict future demands in communication and stay on top of their game.

What's coming?
To gather an idea about the global indicators, trends, and innovative technologies that are likely to make an impact on how communication businesses will be conducted in the future, Nokia and the Future Today Institute (FTI), a world leader in strategic foresight and futurology management, Know Now Report highlights the key drivers that CSPs need to keep a close eye on.

Zero-touch networks:
We all know that along with the capabilities of 5G, data traffic in modern networks is bound to grow exponentially and so will the challenges of running it optimally. There are currently 4.9 billion internet users worldwide who are engaged online in some way or the other. Moreover, in 2020, IoT devices were responsible for 33% of overall infections in mobile networks.

Human intervention alone will not be enough to manage the activities on the networks. As a result, a lot of interest in implementing AI to automate networks has gained acceptance.

However, zero-touch goes beyond automation. Zero-touch uses intent-based automation allowing networks to self-configure, optimize performance in real-time, and recover from failure faster based on fully integrated self-X life cycle operations (self-serving, self-fulfilling, self-assuring) to automatically meet and respond to customer demands and resources available. CSPs offering AI/ML-driven self-healing services to customers need to have zero-touch solutions that allow enterprise networks to scale without additional IT resources.

For consumers, zero-touch networks translate to speedy productivity with instant access to resources without the hassle of passwords, timeouts, special authorizations, or multiple authentications. Considering that there will be an estimated 38.6 billion IoT devices worldwide by 2050, network agility and efficiency will be the key determinants for business success for CSPs.

Things-As-a-Service (XaaS) model:
To be profitable, CSPs need to ensure that their networks workloads are handled in an extremely efficient and cost-effective manner as managing large networks can be monetarily exhaustive and straining for their growth trajectory. Considering this necessity, Things-as-a-Service (XaaS) models are helping CSPs to save on costs as well as time and energy.

XaaS refers to the concept of delivering IoT capabilities to the end user without operation or maintenance overhead. Through the XaaS model, CSPs can lower their CAPEX on physical assets or software functions through the use of artificial intelligence (AI). CSPs also have the option of providing their enterprise customers by offering network-as-a-service (NaaS) solutions. For instance, PCCW's Console Connect Software-Defined Interconnection (SDI) helps its customers connect to global data centers, clouds, cloud-based applications, and business partners through a secure and easy-to-operate platform, enabling optimization of network coverage.

The NaaS market is estimated to touch $15 billion by 2025, as per recent stats. Furthermore, given the increasing transition towards a cloud environment, such cloud-based services are opening up new opportunities for CSPs in otherwise resource-intensive network management systems. Leading in the cloud-based services, Etisalat has partnered with Contact Center as a Service (CcaaS) provider NICE to come up with innovative customer experience (CX) solutions that operate in the cloud minus the need for physical hardware, enabling easy augmentation to modern microservice technologies, easy scalability, and quick adaptation to changing market conditions. Etisalat's CCaaS solution empowers organizations to deliver outstanding customer experiences without the upfront investment of building their contact centers.

Free internet:
It may sound too good to be true now but it can eventually happen. Free internet access could soon be a reality with companies offering bigger packages by providing ubiquitous connectivity to their customers. Moreover, satellite operators have been sending satellites to space to provide high-quality internet connectivity to customers located beyond the limits of terrestrial infrastructure. Satellite-based broadband connectivity is seen as a potential technology to connect the unconnected to the internet without the need for ground-based infrastructure. Meanwhile, the terrestrial mesh networks are also constantly evolving with innovations such as self-healing capabilities for networks that guarantee uninterrupted connectivity.

Free connectivity is not a new concept. Facebook free basics offered free internet to access Facebook and other web-based services through partnerships with local CSPs in over 60 countries. When data has become the world's most valuable commodity, companies would rather tap into the data on their networks by going easy on the subscription charges. Free internet has the potential to offset the valuation equation for CSPs' connectivity services by creating new forms of competition and disrupting the ICT industry. CSPs need to be open to this idea of the possibility of free internet access and would do well in exploring the possibilities and strategizing in regards to understanding the needs of consumers and enterprises in the new environment.

Public Cloud:
Hyperscalers such as Google, Amazon and Microsoft are building data centers, monitoring systems and software to expand their reach to customers. The systems of these big cloud services providers are designed to reduce downtime and data loss and they are at the top of their game in terms of technological and capital prowess. For example, AWS currently has 84 availability zones (AZs) across 26 global regions and has plans to launch 24 more AZs and eight more regions soon. AWS Middle East (UAE) region will consist of three Availability Zones and become AWS's second region in the Middle East giving customers more options and flexibility to leverage advanced technologies from the world's leading cloud. As the demand for cloud-native services gathers momentum, especially for 5G services, without a doubt, CSPs will benefit from partnering with hyper-scale players to accelerate their cloud evolution strategy in regards to cost, performance, and long-term competitiveness. Conversely, Nokia and Google Cloud are already collaborating to provide cloud-native network functions, 5G edge services, and a 5G core to mobile operators as well as to innovate new solutions for CSPs to help deliver 5G connectivity and services at scale.

Interestingly, over half the respondents of Nokia's recent market survey said that they'd be willing to pay more for 5G services if they understand the "5G difference." This indicates that CSPs have a ready market where the consumers are comfortable paying a premium for attractive offers that go beyond faster connectivity. Hence CSPs need to leverage the potential for higher-value 5G services and forge partnerships to maximize their market reach. TR

Netcracker recognized for groundbreaking RAN and edge orchestration technology

Netcracker Technology announced that it received two Network Transformation Awards. Netcracker non-real-time RAN intelligent controller, part of Netcracker Open vRAN Domain Orchestration, received the award in the 5G Product Innovation category for its use of AI/ML and standard O-RAN interfaces to maximize RAN optimization. The solution, developed with Netcracker's parent company NEC, helps support new use cases, such as AI-driven energy-efficient optimization of massive MIMO antenna systems and 5G RAN slicing.

Netcracker Edge Service Orchestration won for Edge and Cloud Excellence due to its ability to meet the stringent latency and high-performance demands of multi-access edge computing (MEC) services. Its cloud-native technology, microservices architecture and open APIs enable it to run on any public or private cloud platform and create new opportunities for CSPs worldwide.

"It is truly an honor to receive this recognition," said Ari Banerjee, SVP of Strategy at Netcracker. "Our mission is to help 5G and cloud technologies evolve and also to help CSPs maximize their benefits with practical solutions and proven use cases. These awards are a validation of the progress that we've made in breaking new ground in these critical areas."

TELUS creates smarter, more sustainable and efficient cities

TELUS is partnering with Google Cloud and NXN Digital to deliver the next generation of sustainable, efficient, secure, and innovative Internet of Things (IoT) technologies that will empower businesses, communities, and their residents through a vast ecosystem of people-first solutions.

This strategic alignment is combining the strength and speed of TELUS' leading networks with Google Cloud's infrastructure and data analytics, and NXN Digital's "smart city as a service" platform, to enable cities and districts of any size to improve the lives of their citizens. From dynamic traffic signaling that reduces congestion and emissions, to data analytics that creates smarter, more efficient city planning, the three organizations are transforming the way municipalities operate in our increasingly digital world.

Combining the strength of Google Cloud and NXN Digital's twin technology enables TELUS to deliver a wide range of smart solutions through a seamless, end-to-end experience, ensuring full interoperability between IoT sensors, management platform, and cloud infrastructure, all powered by TELUS' global-leading connectivity.

TELUS smart city solutions fall within four foundational pillars: infrastructure and environmental sustainability, intelligent transportation, public safety and security, and health. These solutions are key in building a healthier, safer, greener city.

Nigeria records the highest mobile web traffic

As smartphones have become the norm worldwide, they have also replaced desktops/laptops as the preferred mode of accessing the internet. According to the numbers presented by StockApps.com, 54.86% of global web traffic came through mobiles in December 2021. Nigeria registered the highest share of mobile web traffic among nations covered in the analysis at 82.63%.

India in the second spot with 73.8% of web traffic on mobiles.

Over the last decade, the share of web traffic on mobile phones has consistently increased. In 2011, mobile phones accounted for only 4%-8% of the total web traffic. In December 2021, this figure increased to 54.86%.

Even though the future of the internet is headed in one direction, the internet habits of users all over the world are wildly different. Developing countries like Nigeria and India are currently the front leaders in the mobile internet revolution. A massive 82.63% of the internet was browsed on mobile phones in Nigeria. In India, the share of mobile web traffic was at 73.8%. Together, these two countries account for more than 20% of the global population.

Turkey occupies the third spot with 68.52%. The status of Turkey as a developed nation has become debatable of late, but regardless, it's the first European nation on the list. Singapore, China, and the United Arab Emirates occupy the following spots, and all of these countries have more than 60% of their web traffic coming through mobile phones. The worldwide average is 54.86% It's interesting to note that most developed economies have mobile web traffic in the 40%-50% range. The Republic of Ireland has the highest share of mobile web traffic among Western European nations at 59.39%. It is followed by Spain 51.46%, Italy 49.54%, France 48.91%, and Sweden 47.99%. European financial powers UK 47.20% and Germany 43.81% have less mobile web traffic than the United States 48.77%.

ICT Maghreb

ICT MAGHREB 2022 is a professional exhibition on information and communication technologies reserved for IT decision makers. More than 40 keynote experts, talks, conferences debates and workshops are organized over three days attracting a keen interest of the public.

Place: Palais de la culture Moufdi Zakaria, Algiers, Algeria

14 - 16 MARCH

GISEC

A most established networking and business epicenter for the cyber and IT security industry, GISEC 2022 builds on its decades of relationships with the global InfoSec community, corporate leaders, end-users from government and major buyers of cybersecurity solutions.

Place: Dubai World Trade Center

21 - 23 MARCH

Cabsat

With over 10,000 visitors from 120 countries, the event brings together key international decision-makers, buyers and thought leaders, eager to meet face to face and learn more about your company's products and solutions.

Place: Dubai World Trade Center, Dubai, UAE

17 - 19 MAY

Latest updates on:
www.telecomreview.com

Comex

At Comex 2022, a specific focus will be placed on buyer potential of oil & gas, transportation & logistics, investments in ICT, education, healthcare, banking & finance, tourism, retail, and manufacturing, which are all major industries and sectors listed in the national strategy for development.

Place: Oman Convention & Exhibition Centre – OCEC & Virtual

23 - 25 MAY

5G MENA

MENA returns in 2022 as the leading event in the region to focus on advancing and commercializing 5G networks.

Place: Jumeirah Beach Hotel, Dubai, UAE

30 - 01 MAY - JUNE

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: Virtual and physical

07 - 08 DECEMBER

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