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NOKIA ACTIVELY SHAPING THE FUTURE OF MOBILE NETWORKS

Tommi Uitto, President of Mobile Networks, Nokia

Bernard Najm, SVP, Mobile Networks, Nokia Middle East and Africa

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■ Nokia actively shaping the future of mobile networks

■ ICT will enable a more sustainable future through openness, collaborations and shared success

■ Etisalat leading the way in digital transformation

■ IoT in the 5G era: Connectivity to the next level

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Toni Eid,
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Increasing traffic, improving networks!

There is no doubt that we have witnessed in the last 5 years a huge triple digits growth in data traffic, which has exceeded all expectations. The increasing use of mobile apps by end users demands network enhancements, from increasing capacity and managing the network capabilities, to the optimization of the network that can be easily managing multiple apps and multiple connections with millions of users connected.

This is why the networks optimizations using SD-WAN is gaining ground and every vendor is trying to go further in order to offer the best solutions for the networks, at the level of architecture, configurations and benefits.

The SD-WAN delivering faster multi connections at low cost has become among the most important technologies. Generally SD-WAN has many pillars such as:

- Ability to support multiple connection
- Capability to create dynamic path
- Easier configuration

Also, the SD WAN is used more to support SDN beyond data centers, cloud-based management and automation to virtualize the enterprises' connections and make simple delivery of services between remote and branch office to clouds and data centers which is essential these days.

Join Telecom Review's upcoming virtual panel on April 27th, and get the latest from the leaders of networks optimizations and SD-WAN.

Lighting up the Future

Building a Fully Connected, Intelligent World


HUAWEI

Tommi Uitto, President of Mobile Networks, Nokia

Bernard Najm, SVP, Mobile Networks, Nokia Middle East and Africa

Nokia actively shaping the future of mobile networks

With evolving technologies, new trends have emerged shaping the mobile communications industry. Nokia has been a leader in that space with new technologies uplifting the overall ICT industry. In order to discuss Nokia's mobile networks business and activities, Telecom Review spoke to Tommi Uitto, President of Mobile Networks, Nokia; and Bernard Najm, SVP, Mobile Networks, Nokia Middle East and Africa.

How is Nokia shaping the mobile communications industry globally and in Middle East and Africa in particular? And how is your commitment to Middle East and Africa reflected?

Tommi Uitto: Nokia is actively shaping the future of the mobile communications industry on many fronts. We are a global leader in 4G

and 5G. We are the global leader in private wireless networks for enterprise customers. We were part of the first 5G launches in the world on April 3, 2019, in South Korea where we supply all three networks. Since then, we have launched 5G networks in 39GHz, 28GHz, 26GHz, 3.5GHz, 2.5GHz, 850MHz, 700MHz and 600MHz, in all continents except the Antarctic.

Further, we are shaping the market with many exciting innovations within 4G and 5G technology. For example, we were the first in the world to pioneer end-to-end 4G and 5G network slicing across RAN, transport and core networks. Slicing enables operators to deliver unique, isolated 'slices' of the network to their customers, tailored to specific applications and meeting specific performance requirements. In February 2021, Nokia's 4G/5G slicing solution received a prestigious award from GTI in the 'Innovative Breakthrough in Mobile Technology' category.

We recently announced a 4G/5G network slicing trial with Mobily in Saudi Arabia, which enables the operator to offer new Fixed Wireless Access services to priority consumer and enterprise customers.

Overall, expanding the 5G market to new enterprise segments is a key strategic focus area for Nokia as asset-heavy industries and industry verticals are starting to make use of wireless technology and Internet-of-Things (IoT) to automate their business processes. Our Bell Labs colleagues say that most industries have been able to improve their productivity, thanks to computers and digitalization by an average of up to 3% over the past decades. But the so-called physical industries -- industries where something moves, changes form or needs to be controlled -- have lagged behind with less than 1% productivity growth CAGR. The reason is that there was no proper technology to connect objects in a wireless and reliable manner. 5G is totally changing this and it is, therefore, opening new exciting opportunities for operators to enter new markets and grow revenues with existing customers.

Bernard Najm: There has been a lot of press coverage about 5G launches in the US and South Korea however, Nokia is also part of the largest 5G launch in the Middle East and Africa that is really focused on delivering broad socio-economic benefits to all. The 5G launch with Zain in the Kingdom of Saudi Arabia (KSA) leads the way for the whole continent and plays an important role in contributing to the country's vision. Also, with our long-term partner stc in Saudi, we reached another milestone in the 5G commercial network development, demonstrating New Radio (NR) with 8 carrier aggregation (CA) using Nokia advanced mmWave technology. Our mmWave technology has enabled the fastest 5G speed in the country and this achievement demonstrates the capacity of our commercially deployed 5G solutions.

MEA is a very diverse region; some countries are at the forefront of 5G

> "Nokia's focus is to help our customers build their networks and future proof their investments, by providing them with our comprehensive portfolio"

> We have over 200 commercial 5G engagements; 152 commercial 5G deals and 63 live networks as of 7th April

adoption while others are preparing for 5G. At the same time, there are many countries in the region where 2G, 3G and/or LTE are the key technologies. Many of our customers are investing now in LTE and LTE advanced technologies. As a leader in LTE network performance globally, according to independent third-party research like that of Tutela, Ookla, RootMetrics and OpenSignal, Nokia's focus is to help our customers build their networks and future proof their investments, by providing them with our comprehensive portfolio. Nokia is fully committed to Middle East and Africa region with its wide range of product portfolio in different technologies. Today we have nine publicly announced commercial 5G deals across the region with leading operators and we have deployed hundreds of thousands of 4G sites.

Tommi Uitto: Dynamic Spectrum Sharing (DSS) is another area where we have notable achievements, having delivered the industry's first DSS solution in April 2020 that supports spectrum sharing between 2G, 3G, 4G and 5G. We were also the first network equipment provider to make its 5G standalone (SA) private wireless technology commercially available in July 2020. Nokia introduced the world's first commercial liquid cooling 5G AirScale Base Station solution which helped Finnish mobile operator, Elisa, reduce the potential energy expenses of its base station by 30 percent and CO2 emissions by approximately 80 percent.

And last, but certainly not least: Open RAN. We are fully committed to ORAN. Nokia was the only large, established supplier who endorsed and help foundation of Open RAN Alliance when it was only five operators. We see a lot of interest from our customer in this and we want to be shaping the future together with them, including designing Open RAN interfaces and defining an adoption plan.

Let's start with MEA: in 2020, new challenges emerged at the level of mobile networks. How did Nokia manage to face them to maintain a good customer experience?

Bernard Najm: Middle East and Africa is one of the most diversified telecom markets in the world. Stretching from Senegal to Pakistan and from South Africa to Iraq, it spans regions with highly advanced connectivity where

5G rollouts are happening at pace, as well as isolated rural areas with some of the most limited connectivity on the planet. The market represents the wider world; and in 2020, at a time when half of the global population went under confinement, the challenges faced by its mobile networks are representative of those faced across the globe.

Over just few weeks, we saw approximately 30% traffic growth in MEA networks – the same kind of growth that we would usually expect in a year. It is not just the scale of the increase, but also the significant behavioral changes as whole populations moved abruptly to a new digital way of working and living, leaving city centers deserted and placing unprecedented pressure on residential networks.

We, at Nokia, worked closely with operators to help them respond swiftly to the challenges by reducing congestion through network optimization and upgrades; and together, we also worked on scaling the network adding capacity in the new "hot zones" through spectrum expansion and additional sites that help prepare for the uncertainty moving forward, where in-built scalability and flexibility will be key in both access and transport networks. Fixed Wireless Access solutions, built over LTE or 5G, are also providing an effective way to expand broadband access to reach unserved and underserved communities.

Today the priority is shifting from quickly and decisively responding to urgent challenges toward evolving networks in a progressive way, making the most of network automation to create more flexible network architectures that can be run with minimal human intervention.

Telecoms plays a key role in accelerating the global digital transformation and the advance of 5G, providing a catalyst for the world's fourth industrial revolution and enabling advanced e-health, e-commerce, e-learning, cloud robotics and more. If we invest now, we can further strengthen our infrastructure, economies, and societies to cope in the best way possible with whatever challenges future decades may bring.

What would you consider as the turning point for Nokia's Mobile Networks?

Tommi Uitto: Certainly, the implementation of our turnaround program in 2019-2020 is a clear turning point. These changes and improvements have set us on the path to win. We are a trusted vendor, repeatedly recognized for ethical business practices and are shaping the market and driving adoption of Open and Virtualized Radio Access Networks. In 2021, we'll finalize our portfolio renewal and continue benefiting from our momentum in 5G with CSPs and enterprise customers for private wireless networks.

What is the status of Open RAN in the Middle East and Africa region? What are the opportunities it offers?

Tommi Uitto: Nokia has long been a believer in – and champion of – open and interoperable technologies, and we believe that Open RAN technology, by disaggregating hardware and software components and leveraging open interfaces, has the potential to enrich the mobile ecosystem with new solutions and business models, and an expanded multi-vendor ecosystem. There are 27 significant CSPs and many suppliers behind it, including Nokia. The development of an Open RAN is not a matter of "if" and more a discussion of "when", "how much" and with "whom". While delivering on our promise to our customers of a competitive 5G RAN, we will lead in O-RAN/vRAN to offer products, solutions and services for best performance and lowest TCO in an open, multivendor environment. It is fair to say that Open RAN is not fully mature yet and the specifications continue evolving. This is a global fact. This said, it makes sense to start trying out the technology regardless of the market.

Bernard Najm: By enabling innovations, such as artificial intelligence (AI) and machine learning (ML) applied to the RAN with RAN Intelligent Controller (RIC), Open RAN will offer many benefits. These include improved network performance; accelerated time-to-market of new services and functions; and more flexible and agile networks.

Open RAN is in the exploration phase in the Middle East and Africa region. While some operators have chosen to conduct some trials based on O-RAN interfaces, it is evident that the maturity of this ecosystem will evolve over a period of time. We expect to see O-RAN deployments in commercial networks within the next couple of years, and we are ready to support our customers in this.

How is OpenRAN helping evolve 5G networks?

Tommi Uitto: Open RAN will help drive innovation, for example with the new network element called RAN Intelligent Controller (RIC) which enables exciting use cases with AI/ML. We recently launched Services Enablement Platform (SEP) combining RIC with Mobile Edge Computing (MEC) benefiting from decentralization to network edge. Further, Open RAN will drive more choice, as eventually operators can better mix and match RF and baseband solutions from various suppliers. For instance, in the USA we have replaced our competitor's base stations at some stadium with a special product, connecting our baseband with a special antenna system from Commscope. This became a win-win-win-win, for our operator customer, the operator, Nokia and Commscope. Furthermore, Open RAN will be a catalyst to start making use of cloud computing in RAN. You see, you can make Open RAN in proprietary platforms with custom silicon, you can make Virtualized RAN (vRAN) that is not Open RAN compliant, but the reason why they are linked is that the new Open RAN baseband suppliers cannot afford to develop their own hardware – nor should they – so they resort to general purpose processors and commercial, off the shelf hardware. This is a good catalyst for operators to start thinking about how to reap the benefits of cloud computing in RAN, just like they have done with their IT workloads and increasingly mobile core network functions.

In terms of 5G, how many customers of Nokia have already transitioned from 4G to 5G? Which region is leading today in 5G deployment?

Tommi Uitto: As of 7th April 2021, we have 152 commercial 5G deals for wide-scale deployment. Our success rate in converting our 4G customers to 5G is

approximately 90%, excluding mainland China. Some of the early adopter markets include South Korea, the USA and China. Many of the GCC countries such as the United Arab Emirates and Saudi Arabia are also pioneering in terms of 5G leadership.

Where does Nokia rank in global 5G deployments? And how important is the Middle East and Africa market for Nokia?

Tommi Uitto: We are the global number two supplier in 5G, excluding mainland China, and third overall. We have over 200 commercial 5G engagements; 152 commercial 5G deals and 63 live networks. As many as 29 of the top 30 mobile operator groups in terms of subscriber base run Nokia base stations. For us, Middle East and Africa is a very important market, and some of my largest customers are in this region.

Bernard Najm: Operators in the Middle East and Africa were among the first ones globally to introduce Nokia 5G technology and the momentum continues. Our 5G public references in MEA include all the operators in Saudi Arabia (stc, Zain Saudi and Mobily) and the UAE (du and Etisalat), as well as Ooredoo Qatar, Vodacom South Africa, Safaricom Kenya and Togocom. In addition, we expect to see the next wave of 5G deployments in North African countries in 2022 and beyond. Overall, the Middle East and Africa region is very important for Nokia with a large number of customers and we expect to see this 5G momentum continuing.

How does Nokia plan on driving its 5G momentum in 2021?

Tommi Uitto: From the start of the year, we brought together the wireless networks and services under one roof to better align with the way that our customers buy. Our number one priority is to close whatever remaining roadmap gaps this year, building on our turnaround of 2019-2020 and further increase in 5G R&D investment. We will continue converting our 4G CSP customers to 5G and win new customers in transition from 4G to 5G. We will also shape the industry and the market with ORAN and vRAN. We will keep our lead in solutions such as private wireless networks, small cells, 4G/LTE field performance, and end-to-end 4G-5G network slicing across RAN, transport and core.

Going forward, in addition to 5G, what will be the main areas of focus in terms of mobile networks?

Tommi Uitto: If 5G as an overall technology is driving growth in our market, then Enterprise as a customer segment is also driving growth. With the improved IoT capabilities of 5G, asset-heavy industry verticals can better automate their business processes. They can use a combination of operators' commercial networks, slices of the commercial networks, as well as private wireless networks. In other words, Enterprise as a customer segment is a key focus area in 4G and especially in 5G, especially with the URLLC and eMTC capabilities. Looking into more detail and beyond 5G, ORAN and vRAN, key focus areas include further improvements in spectral efficiency, power consumption and use of AI/ML. Progressively, we start increasing our research on 6G as well. TR

> If 5G as an overall technology is driving growth in our market, then Enterprise as a customer segment is also driving growth

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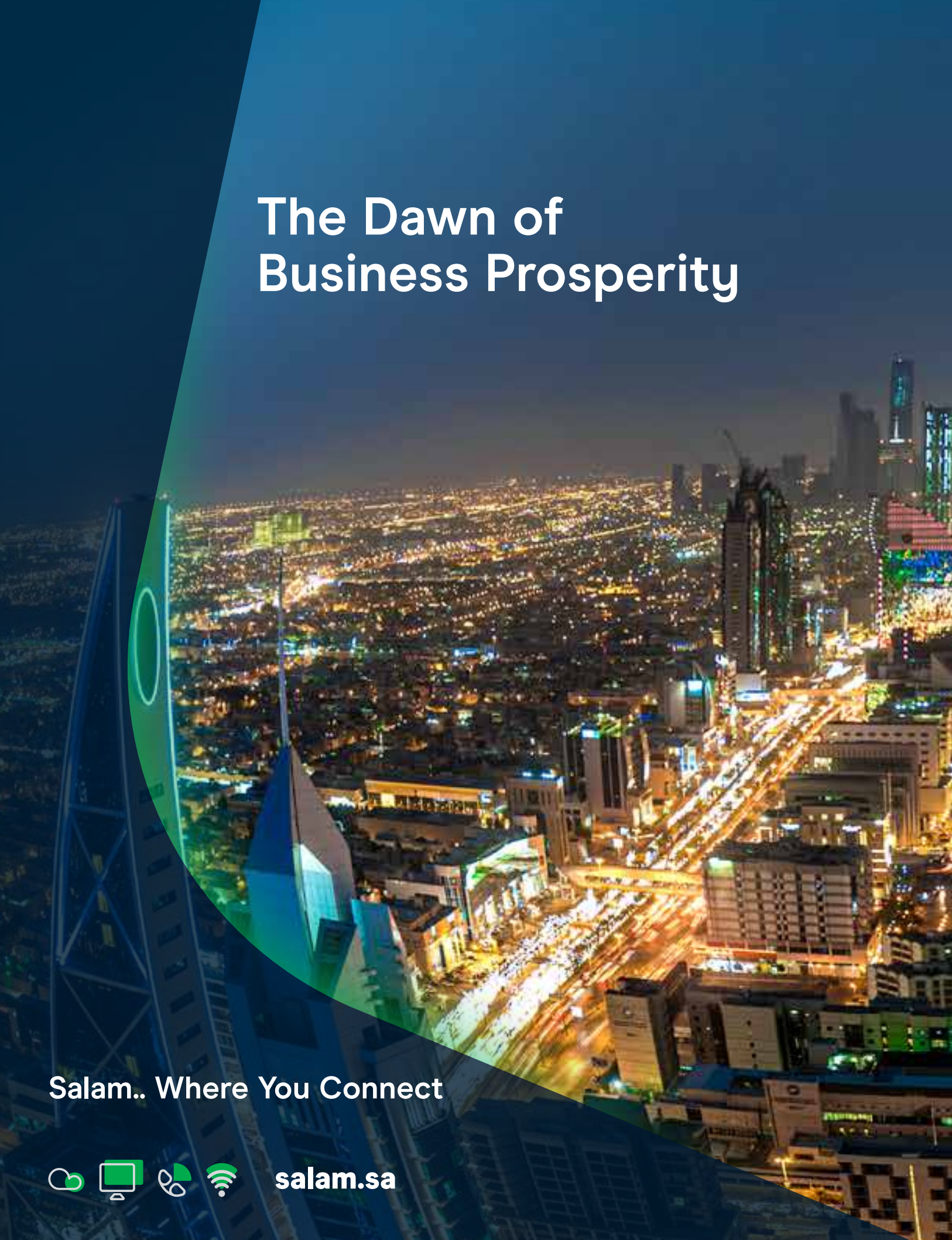

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ICT will enable a more sustainable future through openness, collaborations and shared success

The information and communications technology (ICT) sector has a vital role in building a more resilient, sustainable future. Innovation within this realm is about more than just addressing the challenges we face as local and even global communities – we innovate in order to create a brighter tomorrow. While COVID-19 is our priority for today, the post-pandemic world will need an innovative approach towards economy recovery and improving quality of life, making businesses smarter, and creating a more inclusive world in which everyone has the opportunity to thrive, thereby enabling greater prosperity. However, to create the most value in a society empowered by connectivity, it is essential that innovation is focused on not only means of achieving economic growth and strength, but on bridging the gap between the haves and have-nots by fostering digital inclusion on a national, regional, and even global scale.

It's impossible to deny that COVID-19 has had a massive impact on individuals, businesses, and countries across the world, however, the positive side is that technology has played a significant role in enabling businesses and public services as close to usual in many situations via accelerated digitalization initiatives, as well as in combatting the disease itself through innovation in healthcare and scientific R&D. The past year has emphasized just how important a solid ICT foundation can be, but it has also created new requirements for digital infrastructure. According to a recent study by the market intelligence and advisory company IDC, various senior executives highlighted that the COVID-19 have positively led to an impressive 76% of manufacturers in the Middle East, Turkey and Africa (META) region to engage in or about to start, a formal Digital Transformation (DX) program, and that 65% of Global GDP will be digitalized by 2022, driving Over $6.8 Trillion of Direct DX Investments from 2020 to 2023.

Huawei has worked closely with carriers to ensure stable operations of more than 300 networks across 170 countries, while successfully deploying 140 commercial 5G networks in 59 countries with over 50% of these were built by Huawei, in addition to helping entities within the public and private sectors to rapidly adopt digital solutions that enable continuity during a time of massive societal upheaval. Huawei

also ranked first in the number of SEPs filings among 5G companies worldwide. The 5G standard essential patents (SEPs) which is filed by the Chinese technology giant accounted for about 15.05% of the global total, making it a leader in the era of 5G communication field and in tech markets.

Technologies such as 5G, artificial intelligence (AI) and cloud are more in demand than ever before. They form the bedrock of a digital economy, enabling intelligent and flexible operations. When combined, 5G, AI and cloud create a solid combination with the potential to drive immense productivity gains, especially during the unprecedented circumstances of the pandemic.

Digitalization on this level also creates opportunities. By 2025 for example, Huawei predicts that 97% of all large companies will use AI, the digital economy with drive prosperity, and 60% of global carrier revenue will be derived from industry customers. In order to achieve digital transformation on a scale that will boost economic recovery and establish a solid footing for sustainable growth in the future, industries in particular need to focus on improving their capabilities, building the ICT ecosystem, and creating value with digital technology.

Investment in 5G innovation is helping to drive digital transformation across all industries. Huawei, for example, is focused on innovation in the three key areas of technology, products, and applications, which will help to breakthrough ICT-related challenges at a company and industry level. Through joint innovation and strategic partnerships with our customers, we aim to drive a 1 to N expansion of 5G applications for business, while also working to develop devices targeted to meet specific industry needs.

5G also stands to benefit society as a whole. For example, the convergence of networks, devices, and technologies such as augmented reality (AR) can create new immersive virtual experiences that elevate our interactions with the world. This has significant applications in education in particular, but the potential expands far beyond that – there are almost limitless ways in which the high precision integration of virtual and physical realities can create growth opportunities. In addition to the obvious educational uses, industries such as entertainment, tourism, transportation and navigation – amongst others – can benefit.

Countries with established ICT ecosystems have the ability to leverage technology to overcome the pandemic and spur economic recovery, but societies with less developed digital capabilities will lag behind even more. The effect of COVID-19 will expand the digital divide, making it even more imperative that we address the gap to produce greater social value and empowerment through technology. Partnering with entities in countries that have less-developed ICT infrastructures with the aim to help deploy new technologies, especially with a focus on mobile coverage and digital literacy, will help to bring communities online, giving individuals the opportunity to leverage connected solutions that can augment their lives and enable them to prosper. 5G can improve access to education, boost business opportunities, and enhance medical care by connecting people to remote doctors.

The deployment of 5G is accelerating worldwide. The forecasts about 5G network deployment that were made one year ago have all become a reality. The number of 5G users globally has reached 200 million, and 800,000 5G sites have been constructed worldwide. This technology is becoming part of core production processes in industries. 5G applications have been deployed in more than 20 industries, including manufacturing, healthcare, education and logistics.

The pandemic has revealed the value of cooperation in overcoming one of the greatest challenges the world has seen in recent times. We need to take this lesson and apply it to our future, because while COVID-19 may have closed doors, it has opened new windows of hope. Collaboration can empower the progression of global society, building new opportunities for economic growth, sustainability, and prosperity. This is what the future of ICT is – and Huawei intends to continue working alongside customers and partners across the world to help drive digitalization in ways that will make life better, businesses smarter, and the world more inclusive.

We all share the challenge to reach an honest consensus on whether technology is an engine of human progress. The other challenge will be taking resolute action to make technology truly effective and create value for all. If we claim that technology is critically important but its development is ideologically wrong, this will only result in division, confusion, and regression.

We must reach a global consensus on this issue and believe in the power of technology to leverage it for the benefit of the society. TR

By Charles Yang, President of Huawei Middle East

Countries with established ICT ecosystems have the ability to leverage technology to overcome the pandemic and spur economic recovery

KSA innovates further, set to establish Digital Government Authority

Saudi Cabinet approves the establishment of Digital Government Authority (DGA). This shows the Kingdom's commitment to becoming a leading digital economy.

By establishing the Digital Government Authority, new horizons in digital government services will be opened to enrich the citizen's experience through proactive and integrated digital services. In addition, it will be improving government digital business models, maximizing the return on investments (ROI), and developing the talent of government employees, according to Abdullah Alswaha, Minister of Communications and Information Technology, and Chairman of the National Digital Transformation Unit.

The authority is responsible for building the national capabilities specialized in digital government to adopt and enable modern technologies such as the cloud. It will also adopt policies related to the authority's activities, plans, programs, and projects necessary for its implementation, in order to enhance the overall e-government experience and raise the level of quality and efficiency of digital services.

In a previously held virtual meeting organized by the Saudi Ministry of Communications and Information Technology (MCIT), e-government experts agreed upon that the fundamental objective of e-government is to offer public services to citizens in an efficient, real-time, transparent, secure, and cost-effective manner.

Hence, in the journey of digital transformation, governments need to pay great attention to cybersecurity, resilience, incident response, awareness, and business continuity practices to provide uninterrupted and secure e-services within their communities.

New VAT measure touches telecom operators

Oman will start implementing five per cent value-added tax (VAT) from April 16, according to the Oman News Agency.

It is estimated that VAT will contribute 1.5 per cent towards the country's gross domestic product (GDP) and raise around 400 million Omani riyals (Dh3.8 billion; $1 billion) per year for the country's exchequer.

The implementation of VAT comes in line with the GCC framework that was agreed between the six nation block. The UAE and Saudi Arabia levied five per cent VAT on January 1, 2018 followed by Bahrain. Saudi Arabia later hiked VAT to 15 per cent amidst shortfall in revenues due to plunge in oil prices.

Saud bin Nasser bin Rashid Al Shukaili, chairman of the Tax Authority in Oman, said all necessary preparations and requirements to implement VAT from April 16 have been completed.

He explained that companies have been given the necessary time to prepare their accounting systems and other measures for tax compliance.

Commenting on the latest VAT news, telecom operator Ooredoo said that there will be some changes to their service tariffs.

Meanwhile, in a separate statement, the Tax Authority has called on all suppliers not to raise commodity prices under the pretext of implementation of VAT before its scheduled date of April 16.

Tax Authority said it will not hesitate to take the necessary legal measures against such violations and urged consumers to promptly report any irregularities.

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Etisalat leading the way in digital transformation

2020 has been a defining year for Etisalat with intensive transformation and agile delivery of services, ensuring a strong performance while making Etisalat well positioned for the future. The unprecedented economic headwinds caused by the pandemic have demanded agility and capabilities to quickly adapt to the present market conditions.

There were some great initiatives carried out across Etisalat markets setting pace for digital innovation keeping in line with the company strategy to 'drive the digital future to empower societies'.

UAE setting the digital agenda

With the fastest mobile network in the world and the most valuable consumer brand in the Middle East and Africa for the fourth consecutive year, Etisalat UAE's digital agenda was accelerated during the year.

Etisalat remained focused on growing digital business-to-business (B2B) and business-to-consumer (B2C) revenue; enriching core services; driving value by harnessing new technologies (namely AI, data monetisation, and 5G); and

increasing the adoption of digital channels.

Furthermore, Etisalat UAE has launched fixed 5G services. This will assist the company in extending its broadband services to rural areas. Several 5G use cases and proof of concepts (PoCs) with key entities have also been tested, including for the Dubai Police, ADNOC, and DP World. Each of these organisations is exploiting the power of 5G technology to enable new services and features which were previously not possible.

The company also partnered with the Dubai Police to deliver the Oyoon project. The aim of the project is to raise awareness of e-crime and to improve safety for all citizens, residents, and tourists, using Etisalat's video cloud platform and its AI capabilities. Moreover, Etisalat has worked with the Dubai Multi Commodities Center (DMCC) to create the first smart, sustainable district in the region using the company's 5G network and IoT solutions. Etisalat and the Ministry of Interior (MOI) are, furthermore, continuing to run the Hassantuk project, the first smart fire alarm solution in the region that will cover more than 400,000 villas across the seven emirates.

In addition to the above, Etisalat has evolved towards a cloud managed services provider, sustained by state-of-the-art platforms and infrastructure, partnerships with global industry leaders, hyperscale cloud service providers, and impressive multi-cloud consulting and operations. The company's cloud computing services are the foundation of digital transformation in all industries.

Another area that has witnessed growth is SD-WAN (software defined wide area network) with an overwhelming response from many OEMs and service providers due to its superior features. The value proposition is headed by cost optimisation and efficient performance. Businesses are opting for a managed service provider who can analyse, design, migrate, implement, and monitor SD-WAN solution and provide network performance and application reports. SD-WAN and virtual network services will be the key building blocks for a WAN that can enable business outcomes and become a driver for digital transformation.

The new concept of Secure Access Service Edge (SASE) reduces complexity and improves performance by unifying network, security, and identity management under a single umbrella. In today's world, work is moving outside the office, and securing these remote workers has become a necessity that comes with its own set of complexities. SASE gives businesses the required convergence across multiple areas.

Mobily taking the lead in 5G

Mobily announced a digital transformation partnership with global technology company SAP to energise its sales force automation in line with its overall digital transformation strategy.

Mobily's digital transformation accelerated growth in all the company's digital channels ranging from the portal and e-shop to the application. New registrations in the app doubled while online store visitors and eShop orders skyrocketed.

The company also expanded coverage on the 5G network reaching 50 cities, including most regions in the Kingdom. The company acquired 5G spectrum in 2.6 GHz and 3.7 GHz, increased 5G sites rollout by over 5 times in comparison to prior year and extended FTTH coverage to 26 cities.

Mobily partnered with Open Broadband to provide Mobily Fiber services. Through the agreement with Open Broadband, 3.5 million homes now have access to fixed broadband services through fiber optic technology. Mobily also made its first successful 5G voice call in the Middle East known as Voice over New Radio (VoNR), and was made using the SA 5G network.

With business continuity becoming a key component in the pandemic, the company became the first telecom operator in the Middle East and North America (MENA) region to receive ISO 22301:2019 certification, for the new international standard for business continuity management systems.

Looking ahead, Mobily will continue to implement its "GAIN" corporate strategy as it aligns with Saudi Vision 2030 and ICT Sector Strategy 2023. In 2020, the company succeeded in transforming from mobile centric telco to integrated telco and it aims to become a digital telco in 2021. Mobily will prioritise

customer service excellence and to ensure that the most advanced communication technologies are available to its customers

Etisalat Misr enabling SMBs with digital solutions

The company was the first to introduce B-Digital, a fully digital platform to empower SMBs. This first kind of a platform helps efficient management of operations by giving small businesses the flexibility of managing the services digitally enabling them to smoothly work from home.

Robotic process automations are currently being utilised to reduce the handling time of complex interactions and processes, creating a digital workforce.

Among its other achievements, Etisalat Misr launched Etisalat TV, a partnership with E-Vision to launch this state-of-the-art app enabling viewers to enjoy both English and Arabic movies, series and Ramadan productions across smart devices anywhere and anytime.

On the network in terms of mobile internet speed, Ookla ranked Etisalat Misr as having the second fastest download/upload speeds while ranked first for latency.

Maroc Telecom focusing on digital services

Maroc Telecom launched the

Maktabati service as an online digital library for children and adolescents up to 15 years of age, which provides them with educational and cultural content. More than 10,000 educational books, novels and comics are available on the platform in French, Arabic and English.

As the company continually invests in technologies, it was well equipped to implement the above changes and to deal with the increase in demand and rise of new uses that resulted from the lockdowns. This meant that the quality of Maroc Telecom's services was not hampered during the lockdowns.

In 2020, a new self-help service was launched enabling several services to be combined into a unified, user-friendly web page where customers can manage their mobile, landline and Internet lines in a more autonomous manner and through a single account.

In terms of the network, Maroc Telecom's 4G mobile network coverage reached 99 percent of the Moroccan population in 2020.

PTCL focusing on online transactions

In Pakistan, as an industry-first initiative, PTCL launched cash-on-delivery services, allowing customers to place orders for CharJi (wireless internet) online or via a dedicated helpline. This provides access to a complete end-to-end service, with ease of payment, biometric verification and a top-up facility, at their doorstep.

For an enhanced customer experience, PTCL also introduced the new AI-based analytical broadband answering model and the upgrade propensity model with the addition of interactive voice response (IVR), emails and one-way and two-way SMS messages.

With the extension of its partnership with the subscription video-on-demand service STARZPLAY by Cinepax, allowing payment integration, it became easier for customers to pay for their subscription as part of their monthly bills. Customers were also rewarded for making payments via UPaisa, an innovative branchless banking solution from Ufone.

Ufone brings agility for businesses and consumers

Users are now able to access and manage their bundle plans themselves. They can view their usage, extract their monthly bills and make online payments as well as detailed data usage through Ufone's web portal, 'BizEaze'. Ufone also collaborated with PTCL in 2020 to offer SME bundle plans for mobile connectivity, wireless broadband, and fixed connectivity 'Triple Play' bundles. The bundles incorporate a number of off-the-shelf solutions that cater to the most critical business requirements of SMEs, from productivity to collaboration, to marketing and sales and more. Going forward, the company plans to improve its bundle offerings, with cloud and digital services, and business SMSs, among other things.

Ufones's mobile financial services brand, 'UPaisa', was a major move to cashless payments. A mobile app was introduced for iOS and Android users, allowing all essential transactions, including QRbased payments. With a simple and user-friendly interface, the UPaisa app allows its users to avail multiple financial services through one platform. The UPaisa app focuses on simplicity and enables users to navigate with ease.

Ufone maintained its ranking as one of the top three operators in Pakistan in 2020, in terms of customer satisfaction.

Afghanistan brings in affordable eLearning and 'Doctor in your Phone' service

Etisalat Afghanistan made it easier for citizens to access healthcare services during the pandemic. Access to medical facilities is limited in the country, which caused a lot of additional stress for members of the public who required the services of a medical practitioner. In the second quarter of 2020, the company addressed the problem by rolling out its Doctor in Your Phone service.

Additionally, the company supported the education sector during this time. Along with the country's other mobile network operators, Etisalat Afghanistan partnered with the Ministry of Education to find a solution to possible interruptions in education. Given Afghanistan's device penetration and connectivity issues, it would not have been practical to use an existing online model, such as Google Classroom or Microsoft Teams. The company thus rolled out an affordable eLearning platform that makes the curriculum materials available in text form.

In 2020, Etisalat expanded its 4G LTE services and accelerated the process of upgrading LTE in Kabul, by adding 35 sites during the year, taking the overall LTE penetration to more than 60% of sites in Kabul. Etisalat's 4G network was rolled out in the Kandahar Province in July 2020. TR

> Etisalat has evolved towards a cloud managed services provider, sustained by state-of-the-art platforms and infrastructure, partnerships with global industry leaders, and hyperscale cloud service providers

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Technology and industry trend: Huawei launches top ten trends of site power

As emerging technologies such as 5G, IoT, cloud computing, and AI are rapidly commercialized, the digital transformation in various industries is prospering. The transformation towards a smart society brings site power new trends.

Power digitalization

The full power link from power generation, conversion, storage, to use will be digitalized, making energy networks visible, manageable, controllable, and optimizable. Energy network will change from the traditional watt flow to watt+bit collaboration, driving the digital transformation of site power from points, chains, and networks with the concept of Bit Manage Watt.

"Zero-carbon" network

In the future, the full link of power generation, load consumption, and power conversion and storage will be green, efficient, and energy-saving. A zero-carbon network will be realized through the integration of power electronics, digital, and AI technologies.

Lithium storage everywhere

Thanks to its long lifespan and continuous technology development, lithium batteries gradually replace lead-acid batteries in large-scale application. With combination of power electronics and digital technologies, the local BMS and cloud BMS will collaborate with each other and lithium batteries will become intelligent and cloud-based.

From telecom site to social site

With 5G commercial use, a large number of digital sites are emerging. Varied scenarios require more flexible and diversified sites. Traditional sites with the single function of communication connection will evolve to social sites with comprehensive functions, maximizing the site value.

Energy supply diversification

The diversification of energy supply is embodied in three aspects: First, solar energy will gradually shift from supplementary to primary. Second, site power will change to ICT converged power supply and begins to power people's livelihood and production. Third, the diversification of deployment modes, such as centralized solar power plant, household PV power supply.

Full link intelligence

Traditional siloed architecture and isolated management of energy subsystems will evolve towards integrated smart energy. The software-defined subsystems for power generation, conversion, storage, distribution, consumption, and temperature control will use AI algorithms to achieve full-link collaboration and optimal power supply systems.

Simple and convergent

Sites will evolve from equipment rooms to cabinets and poles, reducing the footprint and power consumption. The site power efficiency will be further improved and the electricity fee will also decrease, achieving low carbon emission throughout the entire network and realizing simplified power supply during the lifecycle.

Multi-mode architecture

Site power will develop towards a multi-mode coordinated architecture-supporting multiple energy input and output modes, multi-mode scheduling control and management. One modular power supply system applies to multiple scenarios and realizes converged power supply for different services and devices.

Autonomous driving

Autonomous driving is the development theme of site power in the future. AI technologies will simplify energy O&M, implement remote O&M, self-learning, and automatic O&M, and improve O&M quality and efficiency. The intelligent IoT connection technologies and intelligent sensing technologies will enable digital management.

Safe and reliable

The reliability, security, privacy, and resilience of hardware and software become necessary requirements. Predictive maintenance at the hardware side, and layered control and defense functions at software side, makes the energy industry more safe and reliable. TR

By Libo, VP of Site Power Section, Huawei Digital Power Middle East

VMRay: "We are like an X-Ray seeing everything through"

Having malware detection and analysis at its core, Germany-based cybersecurity solutions provider VMRay is focused on delivering advanced cybersecurity protection to its customers. In an exclusive interview with Telecom Review, chief sales officer Ilijana Vavan elaborates on the importance of being protected in this digital era.


Ilijana Vavan, chief sales officer, VMRay

Amid the COVID-19 pandemic, reports show that cyberattacks have multiplied in number. What is the role of VMRay regarding this matter?

Yes, that is correct. The numbers revealed in KPMG's UAE Covid-19 Cybercrime Survey provide clear evidence: 83 percent of the surveyed companies state that they have seen significant increases in phishing scams (50%), email spamming (46%), and online scams (38%). This trend is likely to continue in 2021. Malware detection and analysis is our core strength. We detect very sophisticated and previously unknown malware that existing cybersecurity solutions miss. This is why our software is typically installed on top of the existing solution. Whatever they miss we catch. We are like an X-Ray seeing everything through.

How important is it for large enterprises to prepare for advanced cybersecurity threats in this digital era?

It is extremely important. Large enterprises and governments are the backbones of every economy. Successfully disrupting operations and services will exert a very significant social impact, especially when critical infrastructure is involved. The effect goes beyond the attacked organization. The UAE's advanced digitalization has created a tightly interlaced community, where one successful attack could create the dreaded domino effect. From the cyber actors' viewpoint, this is very effective. Typically, these attacks are highly complex and involve advanced malware. The preparedness to meet such advanced attacks varies from organization to organization, depending on the maturity of their cyber defense concepts. But they should prepared, and the UAE Cybersecurity Council will be there to lead the way.

The Middle East has been a target of cyberattacks over the years. How can you ensure the protection of customers' databases, servers, and other datasets in the region?

The Middle East has early recognized the advantages of digitalization and the dangers of the same. It has therefore invested in both tracks in parallel, no single digital implementation is done without proper cybersecurity strategy in mind. Nevertheless, even the best cybersecurity fences are prone to advanced, very sophisticated, and until today, unknown attacks. Advanced malware has been designed to evade traditional security defenses. Our solutions close this coverage gap as we seamlessly integrate with the organization's existing security environment and provide threat intelligence that can be shared across the ecosystem, strengthening the organization's cyber resilience. We can help in many ways – from protection against email-borne phishing and ransomware threats to the detection and identification of complex targeted attacks. We power the organization's advanced threat protection capability.

What strategy do you adopt to improve your platform, particularly in bringing malware analysis and detection solutions with high-performance and massive scalability?

We are a German company, based in Bochum which is the European Center for cybersecurity. Renowned Max Planck Institute for Cyber Security, as well as other high tech and cybersecurity universities in the region are a great source of innovation and the best talents in the industry. Our R&D is closely collaborating with these cybersecurity universities making sure we always stay ahead with our high-performing technology.

Having clients in Saudi Arabia, how do you plan to expand VMRay's presence and services in the Middle East region? What is your long-term commitment to your customers?

We just started our global expansion and that includes MEA. We have hired a business development manager for the region based in Dubai, we have signed a distributor agreement with EliteVAD and many resellers have already entered into a partnership with us. We are currently talking to some big system integrators and MSSPs in the region with whom we want to develop a joint strategy securing their customers. In summary, we are here to stay. TR

Role of telecom operators in the innovating 'digital age'

"Telecom operators are fundamental for the digital transformation; those are the ones that invest, build and operate the networks," said Verena Weber, head of the telco policy unit at Organisation for Economic Co-operation and Development (OECD).

In the past decade, network operators have adapted to the changing trends of the digital age. From voice and SMS, now telcos are being driven primarily by an enormous amount of data from the internet. As we move to a more digitized society, this transformation becomes faster than before.

An evitable example of this is the fast-growing fifth-generation (5G) deployment. Many telecom operators are now innovating with 5G technology as it promises extremely fast speeds, extraordinary low latency, and the capacity to carry massive numbers of connections simultaneously.

In fact, according to the latest update from the GSA, more than 400 operators in 131 countries are investing in building and operating 5G networks, either through tests, pilots, and planned deployments. With a steady growth of 5G commercial network launches in 2020, around 65 operators are either exploring or deploying standalone 5G, indicating a rapid move toward end-to-end 5G networks.

With this being said, telecom operators are not just upgrading, they are revolutionizing mobile technology. This brings trustworthiness, scalability, security, and universal mobility across the industry.

Why is digital transformation important?

Digital transformation has the potential to significantly improve consumer lives while providing businesses with new opportunities for value creation. The telecoms industry should be at the forefront of this transformation — both as an industry witnessing a large-scale change in its market conditions and as a key driver of worldwide digitization.

This is also in line with emerging smart technologies such as the Internet of Things (IoT) and artificial intelligence (AI) that can work alongside telcos. With all the developments in the digital age, telecom operators must learn to adapt themselves. To do this, many telcos are exploring new opportunities in a rapidly

widening digital ecosystem to boost their value-added services and cater to a more data-centric and customer-driven economy.

In reality, such fundamental transformation can't happen in a snap. To make the digital business transformation, we need platforms that support high levels of connectivity to sustain the rapidly growing number of devices. This must be resolved by telecom operators as the mobile usage of people continues to expand and evolve.

Each year, the demand for a faster, more effective, and more reliable mobile phone network becomes more prevalent. Truth be told, its functionality evolved from just a typical communications mode into a person's own computing device.

Hence, telecom operators have enabled the shift from cellular radio onto the third and fourth generation mobile broadband and the deployment of Wi-Fi in homes and hotspots. Without a doubt, telecom operators are, and remain, crucial players in the connected economy.

Though some telecom companies may struggle and face stiff competition in the digital era, they still have huge potential to retake lost ground and recover their market shares. By focusing on connectivity, the mobile internet, and IoT, the telecoms industry is here to stay relevant and innovative as the digital scene continuously unfolds around it.

The integral role of telecom operators

The telecoms industry is accountable for the highly-connected, digital world that we live in today. With their networks and services, telcos are certainly the foundation of the internet. They bring businesses and communities together in ways we never thought possible, enabling a more productive and professional environment.

Telecom operators should deliver faster connectivity, communication, and content anywhere, anytime without delay. To be able to adapt to people's behavior on mobile and revamp the customer experience, carriers and service providers must prepare their networks for scalability and flexibility.

Especially during the COVID-19 pandemic, it is essential to maintain network performance and quality to support ensure consumers had access to essential services and continue to remotely work and study without interferences.

Taking this into consideration, telecom operators should deliver higher data rates, lower latency, and greater power efficiencies, alongside a low cost per gigabit service model. The communication between CSPs and end-users should be done in real-time to allow fast downloads of multimedia and video content, with ultra-high resolution for peer-to-peer interactions.

In addition, telecom operators should support multi-device interactions within smart user spaces and personal clouds. Hence, they must deploy a broad spectrum of solutions, including telephone, email, instant messaging (IM) and audio, video conferencing, mobility, and social networking, and much more.

With the ability to create, communicate, control, manage, and share a multitude of data, full transparency and seamless connectivity for all customers regardless of wireless or fixed accesses should be made possible. Most importantly, for security and privacy purposes, carriers and CSPs must lock down their systems and prevent malicious actors from wreaking havoc on their networks.

Besides, as the backbone of complex data flow, telcos should provide a network infrastructure that should be flexible and programmable to deliver large capacity. This should accommodate varying traffic demands and should be built on common platforms that adapt to any cloud-based applications.

Now more than ever, the cloud is being used for its accessibility and ease-of-use for various activities. Thus, telcos should make use of it and offer advanced analytics to control and manage the entire network, with end-to-end built-in security.

Looking at the bigger picture, the role of telcos in the smart city infrastructure and development is set to increase in the coming years as well. Thus, telecom operators can act as a connectivity provider for both IoT service providers and the government itself. Chunghwa Telecom, the largest telco in Taiwan, for example, plans to expand its smart street lighting offering to 90,000 by 2021.

Another telecom operator with a strong portfolio of smart city services is Spain's Telefónica. It has smart mobility, smart environment, smart economy, smart governance, smart living, and smart people services under its control.

The deciding factors for telecom innovation

In more ways than one, telco networks have proven themselves flexible and agile in the face of the pandemic. Yet, to succeed in this ever-changing digital world, they must implement technologies like edge computing and cloud radio access network (RAN) to push a network's computational processes closer to the end-user. As a result, faster speeds and lower latency are achieved.

Operators should also implement network function virtualization (NFV) and software-defined networking (SDN) within their existing networks to support network slicing. This is a rather vital component within the 5G network as it dynamically adapts to support the different types of access traffic coming into the network. Depending on the need, a network slice will assemble resources that would support a specific application.

Massive growth through new technologies is anticipated as more telecom operators change their manner of collection, analysis, distribution, security, and monetization of data. By reinventing the customer relations model, fostering financial flexibility, and establishing risk management, the telecom industry's innovation will continue to be advanced. TR

Professor Charbel Fares,
CEO, SpiceTech s.a.r.l.

Charbel Fares: "Data is a gold mine and we want to make sure that our partners get the most of it"

ICT services have become a need in our daily life. Companies are always trying to offer cutting-edge solutions and software to improve the quality of service and guarantee a good customer experience. In order to know more about the latest solutions and software offered, Telecom Review spoke to Professor Charbel Fares, CEO, SpiceTech s.a.r.l. who explained more about the company's latest CRM solutions.

Can you give us an overview of the main services and solutions that SpiceTech offers? And who are the company's target customers?

SpiceTech was established in 2017 by a group of technology entrepreneurs with two goals:

1. Reducing the cost of software development (mobile and web) and increasing the quality of the software products in the market.
2. Showing the different businesses the importance of the data they have and making sure that they use the most of it.

We are currently a team of ten software engineers with expertise in the below domains:

- Software and database cloud architecture
- Mobile and web full stack design and implementation
- Mobile and web security assessment
- Augmented reality and virtual reality
- CRM design and implementation
- Chatbots and AI
- Internet of Things
- Big data and data analytics

Below is a selection of developed project:

- CRM with WhatsApp Chatbot for Bourj Hamoud Municipality. A project funded by UNDP in order to support BHM to coordinate current emergency response efforts but also to address longer term needs. The system establishes a Municipality Hotline system and a chatbot based on WhatsApp.
- Digital polling system. A system delivered to Vector s.a.r.l to help them create and manage polls in Lebanon and the MENA region.
- Smart farming. Different projects delivered to Sitera Romania to monitor animals in farms.
- Counsela Platform for Online Psychological Counseling.

We have three type of customers:

1. The startups who wish to have their platform ready to be deployed in a very short time and with a squeezed budget without sacrificing the quality. The startups who wish to have a partner rather than a software development company are the one that we like to work with. We believe that our role does not end when we deliver but actually delivery of a product is just one milestone.
2. The companies who want to digitalize their processes and develop their own custom CRM.
3. Companies who wants to assess the security on their existing mobile and web applications.

AR/VR are two technologies that have shaped the ICT industry. How do you leverage them? Are you working on any new projects that involve AR/VR technologies?

After obtaining a PhD in virtual reality, I personally saw the need of AR/VR in our everyday usage since 2006. It took some time for the hardware evaluation

and the internet connection to cope with the advancement of algorithms. At SpiceTech we are working on couple of research projects with universities in Lebanon and France in the AR/VR algorithms and implementation.

We are currently working on a CRM with AR/VR capabilities for building information modeling. This project is being developed for A-Tech, a giant aluminum company based in Australia. We are giving all the stakeholders involved in building access to whatever they need during their site visit by augmenting the reality with virtual elements giving them the possibility to access a full CRM at the backend of the system. The system can be used at all the phases of building development: pre-sale, operation and as-build.

Customer relationship management (CRM) is nowadays a key element in any company's strategy. How do you ensure that your customers have the right CRM tools?

At SpiceTech we consider ourselves as partner to every customer and we make sure to solve his problem in the optimum way as if the problem is inhouse. We take our time to sit with the customer and all the different stakeholders within the company to make sure we understand the problem from all the different angles. We work on optimizing the solution in a way that fits for all the stakeholders. We always think out of the box while proposing solutions. We don't believe that an "all you can eat" or a "one size fits all" solutions are adequate anymore especially when it comes to CRM solutions.

What other technologies do you use in the development of your services and solutions?

Most of our solutions are cloud-based. Our platforms are developed as web and mobile applications. We believe in the cross platform mobile applications development. Our team has expertise in Flutter, React Native, and Ionic. Using such technologies, we can amortize cost without sacrificing security and functionality. We are adopting Scrum methodology for developing, delivering, and sustaining our products. We use different open source tools with Linux servers for our back-end development. We are using Tableau for data analytics as well.

We believe that data is a gold mine and we want to make sure that our partners get the most of it. TR

> We believe that our role does not end when we deliver but actually delivery of a product is just one milestone

Telcos take action in the fight against climate change

Climate change and telecommunications have rarely been put together in one context. However, lately, given the climate emergency that the whole world is facing, telcos are trying to leverage their assets and offer new services and solutions while taking into account the environmental impact.

Telecom and technology companies are increasingly aware of the environmental challenge and some of them have drafted green strategies and plans to limit their carbon footprint and meet their commitment to sustainable development. On average, IT & Network (ITN) equipment and its hosting sites represent about 80% of the energy consumption and the total carbon footprint of a telecom operator (non-technical buildings and vehicles account for only 20 %), according to an article penned by Remy Sfez, business manager, expert transformation IT & Network, Sofrecom.

Zain Group is one of the major telcos in the Middle East that have realized the need to protect the environment. Zain's climate action plan has set targets to reduce emissions, reduce waste, and align with UN Sustainable Development Goal number 13. The company is also committed to building climate change scenarios that would help limit global warming to 1.5 compared to pre-industrial levels.

The Group is well aware of the urgent need to address the climate crisis. Therefore, in order to achieve sustainable growth, Zain has to participate in global efforts to protect the planet and preserve its resources.

Recently, Zain Group was ranked as top MEA telecom operator in CDP's climate change index. The operator attained a Management Scope 'B' rating, making it the highest-ranked and only telecom operator in the Middle East and Africa (MEA) to achieve this mark. Only 35% of the 9,600 companies and institutions included in the CDP list reached the management level score or higher. This proves Zain's commitment to fulfilling its promise to make systematic changes.

One of the leading players in the industry today, Nokia, is also contributing to the global efforts aiming at preserving the environment. The vendor announced that its AirScale 5G mMIMO Base Station will achieve an average power consumption reduction of 50 percent by 2023, outlining its commitment to climate change and zero emissions. This is enabled by continuous improvements in software functionalities and new mMIMO product variants based on its latest SoCs.

Adopting a program for energy transformation concerns several parts of a telco's business, mainly CSR and infrastructure. The first step to consider is identify the areas that consume the most energy based on available data and on consumption measurements.

Climate tech

According to PwC, climate tech encompasses a broad set of sectors which tackle the challenge of decarbonising the global economy, with the aim of reaching net zero emissions before 2050. The main goals of a climate tech is achieve low greenhouse gas emissions, shift to less resource-incentive business models, better resource usage through analytics and data and active carbon capture and storage.

Interest for eco-friendly innovations has risen lately and action against global warming and climate change has become both a challenge and an opportunity. A report by PwC mentions that climate techs represented only 6% of capital development in 2016, however they've grown of about 3750% since 2013.

The development of climate techs can truly contribute to lowering greenhouse gases and limiting the impact of climate change, through the investment in innovation and technology.

Environmental impact of 5G

The telecoms industry was among the first to address its own energy efficiency. The cellular industry was the world's first, in 2016, to commit to achieving the UN Sustainable Development Goals (SDGs), setting an industry goal of net-zero emissions by 2050.

In a byline article published in Telecom Review by Li Xiangyu (Spacelee), vice president, Huawei Middle East, "National and international policies are targeting a dramatic increase in energy efficiency, and a sharp shift from fossil fuels to renewable sources of energy such as solar, wind and water. This will entail a completely new approach to energy use, which must be adopted by every industry and individual. This is where 5G is an important enabler."

5G has introduced new approaches to many telecoms-related aspects, but one of the most important things it introduced was the interest in energy efficiency. For the first time, the planning and optimization of new mobile networks were taking into account energy efficiency in order to deploy 5G as the most sustainable network.

5G, coupled with artificial intelligence, edge computing and cloud, can enable businesses to achieve their climate goals. The intelligent use of resources enabled by 5G will allow telcos and businesses to reduce energy consumption through smart energy management systems, predictive analytics and automation.

Addressing the challenge

Industry stakeholders all have a role to play to meet the climate challenge. Collaboration, as always, is a key factor to achieve energy efficiency. Governments, major telcos and startups can establish partnerships to accelerate innovation while bearing in mind the ultimate goal of net-zero emissions.

One of the major steps to be taken is to adopt climate reporting whereby telcos include the risks of climate change in their financial statements. This step can motivate them to elaborate adequate strategies to lower the risk and decrease their carbon footprint.

Climate change might seem out of the telecoms context, however we are witnessing a shift in mentalities, especially with 5G which has proven to have a transformative effect, even in terms of protecting the environment and achieve the United Nations' sustainable development goals. TR

Etisalat launches interactive web extension dedicated to autistic users

In line with its purpose of bringing people together and commitment to inclusion and breaking barriers, Etisalat along with the Ministry of Community Development announced the launch of special web extension for autistic user to mark the World Autism Acceptance Day on April 2nd.

Etisalat collaborated with Brussels-based IT company Bliss to develop a web extension aimed at empowering autistic people and personalising their browsing experience. The inputs for the autistic-friendly designs were provided by the autistic people based in the UAE as well as the global evidence-based research findings on the condition.

Users can log on to the website and click 'on' to download and activate the 'Etisalat Wider Web' web extension. The web extension will remain on the Google extension page. Using the drop-down menu on Google, users can click on 'More Tools' and 'Extension'. They can click on the 'Etisalat Wider Web' green icon, which has a description of the extension. Once activated, websites will display autistic-friendly settings such as neutral colours like dark grey or medium grey, simplified fonts, simplified menus, simplified layouts, fewer images, ad blockers, and carousel freezing to facilitate reduced sensory overload.

World Autism Acceptance Day aims to highlight the struggles that autistic people face every day and celebrates the unique way autistic people view the world. The World Health Organisation estimates current global prevalence to range between 1 in 100 and 1 in 132 people.

With Etisalat's solution, autistic people worldwide can now access www.etisalat.ae and activate for free the 'Etisalat Wider Web' extension, which instantly transforms a standard web page into an autistic-friendly one.

Zain KSA records fastest indoor 5G speed test

Zain KSA has achieved a record speed of 1.9 Gbps during a successful trial of the 5G indoor solution known as "AirScale Radio System" (ASiR), at its headquarters in Jeddah. The ASiR solution can support a mixed network of 4G and 5G over the same platform, delivering ultra-fast speeds and broad coverage, and countering high penetration coverage losses within buildings, across multiple floors and in both open office space and closed up offices and meeting rooms where coverage rates are often significantly reduced due to the depth of the building design or the distance from the tower. Utilizing ASiR, Zain KSA provides an enhanced indoor solution addressing requirements such as low cost of ownership, compact design and comprehensive indoor coverage offering users a consistent 5G experience.

Notably, Zain KSA has launched its 5G services in October 2019 in the Kingdom and now covers 50 cities Kingdom-wide enabled by more than 4,700 towers. It is through these endeavours and others that Zain KSA is considered as a major enabler, driving forward the digital transformation in the Kingdom, as part of Saudi Vision 2030, and directly contributing to realizing the goals of the ambitious digital economy recently approved by the Kingdom.

This milestone is consistent with Zain KSA's continuous hallmark achievements after Opensignal, the independent global standard for analysing consumer mobile experience, has recently granted Zain KSA three awards: "Best 5G Availability"; "Best Download Speed Experience - 5G Users"; and "Best 5G Download Speed." Similarly, Zain KSA won the SpeedTest award for the "fastest fixed network" in the Kingdom from globally acclaimed Ookla for the year 2020. Zain KSA also ranked first in the "Meqyas" report issued by the Communications and Information Technology Commission for the 4th quarter of 2020, as the fastest fixed internet in the Kingdom, and the largest 5G network coverage across the Kingdom. Gaining further international recognition, Zain KSA earned three awards at the Telecom Review Leaders' summit for "Best 5G User Growth," "Best 5G Infrastructure Deployment," and "Best Cloud Provider." Furthermore, Zain KSA managed to progress to the 12th rank in Saudi's top 50 brands list, as per Brand Finance's annual report on brand evaluation.

Etisalat ties up with Etihad Airways to support UAE's SMBs with digital solutions

Etisalat and Etihad Airways will provide the best-in-class mobile and digital solutions for the evolving business requirements of the small and medium business (SMB) and startup community, Etisalat has announced.

Under this arrangement, Etisalat will be the official partner with Etihad Airways with an objective to enable SMBs through their digital transformation journey.

Esam Mahmoud, senior vice president, SMB, Etisalat and Fatma Al Mehairi, vice president of UAE sales at Etihad Airways signed a Memorandum of Understanding (MoU) in a ceremony attended by senior officials from both companies.

The terms of the partnership will see both entities work on providing customised value propositions for Etisalat and Etihad business customers. Etisalat will provide all its business customers and Hello Business Hub start up community with 'value for money' exclusive Etihad travel offers and will provide Etihad business customers access to special mobile and digital offerings.

"The SMB sector plays a key role in the UAE economy in driving innovation, job creation and disruptive business models. Etisalat has been working closely with start-ups and the SMB community to cater to their requirements and help them grow their business by ensuring a successful digital journey," said Mahmoud.

"This partnership with Etihad is integral to our successful journey for enabling best-in-class solutions and services with industry leaders." he added.

Meanwhile, Fatma Al Mehairi said, "Etihad and Etisalat will cooperate to design special products, offers, and activities that support SMB's to start and grow their business with the latest innovative and convenient solutions. The airline is always exploring new ventures to enhance the customer experience and partnering with a major player in the UAE economy like Etisalat will bring incremental value to both Etihad and Etisalat customers."

Both parties will collaborate to enrich Etisalat's business mobile plans with Etihad's BusinessConnect, a smart loyalty programme for small to medium sized enterprises. Leveraging the digital channels, Etisalat will have digital presence on Etihad Airways' BusinessConnect website, enabling the airline's customers to purchase telco products from Etisalat, and vice versa.

Zain Saudi Arabia, MODON join forces to boost fourth industrial transformation in KSA

To enable the fourth industrial revolution in the Kingdom, Zain Saudi Arabia and the Saudi Organization for Industrial Estates and Technology Zones (MODON) have signed a Memorandum of Understanding (MoU) to provide fifth-generation services, communications, high-quality internet, cloud services, and the Internet of things (IoT) in Modon's industrial cities.

Under the arrangement, the two organizations plan to raise awareness about the importance of digital transformation of factories and exchange experiences in the field of infrastructure development and contemporary technologies, including electronic training and remote training.

The joint efforts are directed towards accelerating the transformation towards the next generation of production processes, managing operations, and supply chains, enhancing the competitiveness of the industrial sector, and enabling it to lead the achievement of economic diversification, in line with the goals of the Kingdom's Vision 2030, according to the statement.

Commenting on the development, chief executive officer of the Saudi Organization for Industrial Estates and Technology Zones (MODON), Eng. Khalid bin Muhammad Al-Salem, said, "MODON aims to empower the Saudi industry and national competencies in this field, and to enhance its competitiveness in the global and regional markets in parallel with raising its investment attractiveness to attract and localize local and international investments with added value to the national economy."

Meanwhile, the CEO of Zain Saudi Arabia, Eng. Sultan bin Abdulaziz Al-Daghaither said, "The memorandum of understanding with the Saudi Authority for Industrial Cities and Technology Zones (MODON) establishes a long relationship of cooperation between us. It also establishes a new era for Saudi industry, with its main pillars: innovation, modernity, and global competition. After the success of our joint project in covering Dammam Second Industrial City completely with the fifth-generation (5G) network, cooperation between Zain Saudi Arabia and today's cities take on more comprehensive dimensions throughout this country. "

Zain Saudi Arabia was recently awarded three awards for Best 5G Coverage, Best 5G Download Speed and Best 5G Downloading Experience by Opensignal, an independent and impartial international organization that specializes in analyzing customer experience in telecommunications networks. Ookla also awarded Zain Saudi Arabia the SpeedTest award for the fastest home internet in the Kingdom in 2020. The Telecom Review Summit also awarded the company 3 awards --Best 5G User Growth, Best 5G Infrastructure, and Best Provider of Cloud Computing.

Omantel, Huawei enter MoU with Hutchison Ports Sohar for 5G utilization

Omantel and Huawei entered a tri-party Proof of Concept (POC) Memorandum of Understanding (MoU) with Hutchison Ports Sohar for showcasing successful utilizations of the telecom giant's 5G infrastructure in three areas.

These POCs, to be implemented at Hutchison Ports Sohar, aim to provide highly reliable communication services and improve operational efficiency, accuracy, time management, and security, among other services.

Omantel, the leading integrated telecommunications services provider in the Sultanate, has embarked upon yet another package of smart ICT solutions that leverage the company's 5G capabilities and have the ability to revolutionize operations in Oman's oil and gas, logistics, and transport sectors, which are vital for the country's sustainable economic growth.

Under the first POC, work on which will start immediately, Omantel will enable Smart Surveillance with artificial intelligence (AI). Smart solutions under this POC will be mutually beneficial to Omantel and Hutchison Ports Sohar, as it will not only diversify and showcase the use of 5G infrastructure beyond network speed and efficiency but also bring more accountability and streamlining to port's operations.

The Smart Surveillance with AI will allow real-time surveillance of the port's loading and unloading transport area, monitor the sea tide, enhance ship container video surveillance, make AI-based intelligent video analysis, allow for AI-enabled unmanned detection and generate an automatic alarm in real-time in case of any default. Other benefits include leveraging AI for HSE compliance and meeting future cost optimization goals. These technologies can be deployed in other port operation management scenarios and crane management etc.

The two other POCs will enhance the uses of handheld devices (Push to talk) for critical communication and pagers over 5G network for real-time location monitoring and messaging.

stc launches MENA's largest integrated operating center

The Saudi Telecom Company (stc) has recently inaugurated its newest digital operations control center, considered as the largest integrated operating center in the Middle East and North Africa (MENA) region.

CEO of stc group, Eng. Nasser bin Sulaiman Al-Nasser confirmed that the digital operations control center includes a system made out of advanced digital processes in several areas. This includes simulation, digital infrastructure management, digital crises management, and reinvention within a range of digital solutions.

Without a doubt, it is a comprehensive and complete technical space abiding by high-security standards. Al-Nasser also noted that this center would enhance the Kingdom's position as a leading regional business center. Additionally, this would help in achieving the objectives of the second phase of stc's strategy "DARE" — digitize stc, accelerate performance, reinvent experience, and expand scale and scope. This strategy deals with digital transformation in various fields.

In detail, the center operates the biggest international gateways in MENA, which have a capacity of more than 8.4 terabits per second and are connected to more than 4 submarine cables. Overall, it combines the latest protection and distribution systems in the world. For the first time in the region, this will be utilized to generally secure the company's service system and the data transmission and voice circuits system for all customers.

In addition, the center also operates and monitors the largest and latest long-range correspondence networks in the region, which exceed 155,000 kilometers of fiber optics. These networks will certainly boost connectivity between the East and the West through the continental marine stations located in a number of coastal cities in the Arabian Gulf.

On the other hand, stc has also worked on developing a plan to deploy the 5G network in more than 47 cities throughout the Kingdom. As a matter of fact, the Communications and Information Technology Commission (CITC) has previously announced that stc has the highest mobile download speed on its 5G network — 342.35 Mbps — in the entire Saudi Arabia.

stc Kuwait and Virgin Mobile MEA get MVNO license from CITRA

Kuwait Telecommunications Company – stc and Virgin Mobile Middle East and Africa (VMMEA) received the Communication and Information Technology Regulatory Authority's (CITRA) approval for the first-of-its-kind mobile virtual network operator (MVNO) license to launch Virgin Mobile Kuwait (Connect Arabia WLL).

The first mobile virtual network operator in Kuwait was announced during a press conference attended by the minister of public works and minister of state for communications and information technology, Dr. Rana Al-Fares; chairman and CEO of CITRA, engineer Salim Muthib Al-Ozainah, as well as representatives from the authority, CEO of stc Kuwait, engineer Maziad Alharbi; CEO of Virgin Mobile Kuwait, Benoit Janin.

Under the arrangement, Virgin Mobile Kuwait will operate using stc's network, with stc acting as a Host Facilities Based Provider "FBP" with Virgin Mobile Kuwait, offering prepaid plans to users, making it the first virtual telecom service provider in Kuwait.

As the region's leading MVNO and digital innovator, VMMEA expects to leverage the strong infrastructure of stc's network to provide superior on-demand experience for pre-paid mobile users through a range of digital solutions.

The previously established consortium was led by VMMEA and included stc as a strategic partner to provide a range of new-to-market fully digital consumer services in the Kuwaiti telecom sector.

The license awarded by CITRA to Virgin Mobile Kuwait to provide MVNO services is pursuant to the agreement for the provision and resale of the services necessary to allow the reselling of services to end-users and operate as a business. Virgin Mobile Kuwait aims to launch its innovative app-based platform with proven technology derived from VMMEA's digital operator platform, mainly targeting the local youth population.

Ooredoo commits to boosting innovation in Qatar

Ooredoo and Qatar Research, Development, and Innovation (QRDI) Council have announced the signing of a memorandum of understanding (MoU) aimed at leveraging the innovation capabilities of Qatar's leading telecommunications provider.

The MoU was signed by deputy group chief executive officer and chief executive officer of Ooredoo Qatar, Sheikh Mohammed Bin Abdulla Bin Mohammed Al Thani, and secretary general of QRDI Council, Omar Ali Al-Ansari.

Under the agreement, the parties will collaborate to explore mechanisms to further expand and leverage Ooredoo's innovation capabilities, to create opportunities for start-ups, accelerators, and technology companies - both local and international - to establish business in Qatar and collaborate on innovation solutions. This will support Qatar's economic diversification efforts by enabling growth of new private sector led product development activities in Qatar.

The MoU is one of several initiatives the QRDI Council has planned for 2021 and falls in line with the vision set out in Qatar's national RDI strategy, QRDI 2030. The 10-year strategy works toward the greater goal of building a knowledge-based economy, as called for in the Qatar National Vision 2030.

The initiative is an example of QRDI Council's ongoing efforts to work closely with large local enterprises to leverage innovation by attracting other private sector entities to co-develop and pilot innovative technologies, as well as grow and scout for the best innovation talent. At the same time, QRDI Council will also facilitate support towards new innovation- driven private sector entities, by creating linkages with Qatar's existing knowledge institutions, which can provide specialized and technical know-how as well as state of the art infrastructure.

Vodafone's new branding: Technology is nothing without humanity

Vodafone affirms that humanity drives their business forward. In line with this, it launches its new brand positioning backed by a multimillion-dollar 12-month-long campaign promoted as "Together We Can".

The "Together We Can" campaign is set to be launched in the UK alongside a new 60-second television commercial featuring a young girl posing questions about the world around her and on the role technology can play in curing disease, fighting climate change, advocating sustainability, and addressing digital inclusion.

"Our new positioning – Together We Can – reflects our belief that, when working together, humanity and technology can find the answers and create a better future for all," Vodafone stated on its website.

The company will bring into the spotlight Vodafone's critical role in helping to answer "big" and important questions, particularly amid the global pandemic. With the commercial comes along a series of stories that will appear in print and digital advertising that will include the benefits of using the Gigabit network, providing equal access to connectivity, and the role of the Vodafone DreamLab app in fighting against cancer and COVID-19.

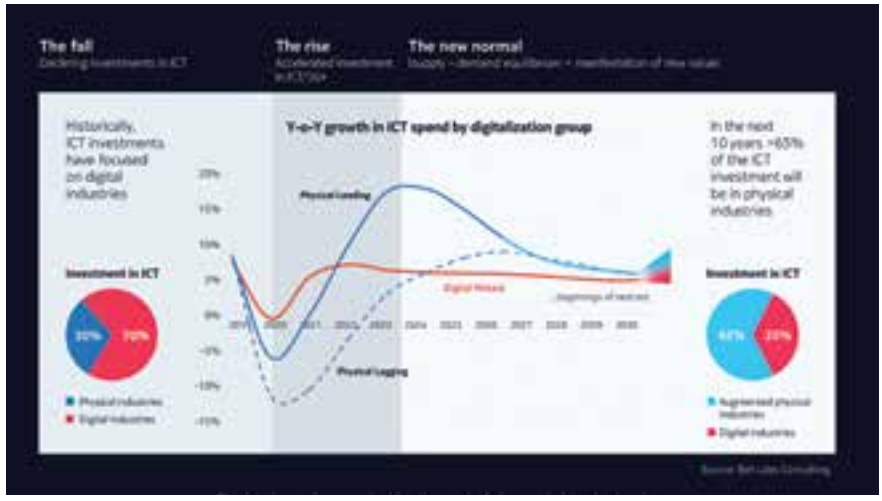
"This is the first time in Vodafone's history that we have an evolution of our positioning that is driven by what is happening in the outside world and the pandemic and the new role of technology that we see. Not so much driven by the evolution of the company," said Anne Stilling, global director of brand and media for Vodafone.

Fuad Siddiqui, Executive Partner and Vice President, Bell Labs Consulting and member of Nokia Bell Labs Senior Leadership

Nokia: "5G+ signals a new renaissance for Middle East and African economies"

MEA economies can unlock new value and growth, but it requires local industries and enterprises to be hyper-productive, adaptively scalable, and ultra-resilient in the face of unforeseen disruptions.

The COVID-19 pandemic was a wake-up call for industries to digitalize. It brought to the fore the stark difference between industries that had the foresight to invest in digital infrastructure and the ones that rely on conventional methods.



Bell Labs Consulting in its The big inversion predicts that a new ecosystem of 5G and related technologies or "5G+" will equip industries with the necessary tools to kickstart the process of digitalization over the next decade. A tectonic shift in Information and Communication Technologies (ICTs) spending is on the anvil cutting across all sectors, from e-commerce and finance to manufacturing and agriculture. The impact of fusing 5G networks with cutting-edge solutions like augmented intelligence, edge cloud, private networks and as-a-service business models will not only give a fillip to productivity and safety but would also help contribute $8 trillion to global GDP by 2030.

Fuad Siddiqui, Executive Partner and Vice President, Bell Labs Consulting and member of Nokia Bell Labs Senior Leadership explains how a new crop of transformational technologies will pave the way for the industries of the future.

Could you elaborate on the concept of '5G+' technologies?

Industries and enterprises are poised to make investments in a broad ecosystem of technologies that Bell Labs Consulting collectively terms "5G+". It comprises not only the underlying foundational 5G networks but also key technologies that will work hand in hand with 5G to digitalize every aspect of a company's operations. This includes edge cloud infrastructure, augmented intelligence/machine learning (AugI/ML), enterprise private networks, and advanced sensors and robotics. These technologies will act in concert and increasingly be accessible "as a service," allowing instant access to the optimum tools and capabilities, from anywhere, at any time.

We predict that we are approaching a "big inversion" in ICT investment in physical and digital industries, driven by this emerging set of 5G+ technologies. This inversion will be realized in three phases: 'the Fall', 'the Rise' and 'the New Normal'. Industries need a bold investment plan to succeed in their journey to a new normal, and to bring about a level of proportional equity in ICT investment between the amount these industries invest in ICT and their respective contributions to overall global GDP and workforce employment.

When this inversion is complete, industries will be equipped to create new economic and societal value.

Why have you chosen to call this trend the 'Big Inversion'?
It is an inversion because increased ICT spend driven by 5G+ will flip the current 70:30 spending ratio between digital and physical industries to a 35:65 ratio in line with the relative GDP contribution of these two industries. It is big because this flip doubles the current enterprise ICT spend; more importantly, it is projected to contribute up to $8 trillion to the global economy in 2030.

Given that MEA is currently lagging behind rest of the world in ICT spending, it presents the region with a unique opportunity to achieve new growth. We see the need for two inversions in MEA ICT spend – the first one is, as indicated earlier, to bridge the gap between digitally mature and physical industries. The second one is between MEA and the rest of the world, as it will help bring the ICT spend in line with GDP contributions.

To what extent has COVID-19 highlighted the need for digitalization to benefit industries across the MEA region?
The pandemic has served as an acute reminder that digitalization doesn't merely enhance industrial growth and profitability, it also critically impacts society and the economy. For example, the sharp growth in video conferencing and telemedicine demand is a testament not only to the effectiveness and maturity of digital services in filling gaps in supply at short notice, but also to the sustainability and resilience of these services. Physical industries now must prepare to digitally augment themselves to reap similar benefits.

5G+ will establish the supply-side readiness required by industries in the post-COVID era to realize optimized productivity gains, strategic resilience, and a more inclusive and purposeful future. These benefits to enterprises can translate into more and better jobs, increased enterprise profits and higher government revenues that will enable the MEA economy to not only recover from a 4.4% GDP contraction in 2020 but also to lead to sustained GDP growth through 2030.

What strategies should physical industries adopt to reduce the gap with their digital peers?
Enterprises within physical industries need to identify the areas that are likely to give them safety, productivity, efficiency (SPE) and resilience gains, define the appropriate metrics, determine the target improvements, and then drive the selection and confluence of Operations Technologies (OT) and ICT. Enterprises must ensure that all operational data are made available in digital form in a timely manner at the highest quality levels.

Enterprises in MEA need to adopt 5G+ technologies, deploy digitalization and automation in lockstep with the reskilling of their workforce. They should create a co-development environment with their operations technology supplier, communications providers and other ecosystem partners. As some of the OT and ICT have not fully matured yet, they need to develop a "no-regret" technology deployment roadmap that will help them shorten the time to optimum digitalization without any stranded investments.

Will digitalization compel a revaluation of businesses strategy and productivity paradigms?
Yes, it will. Especially in a post-COVID world seeking the new normal.

Digitalization will increase the scope of strategy and productivity paradigms to be more expansive and will shorten the planning horizon. Business strategies need to evolve in order to maximize the gains realized from demand-side and supply-side opportunities while simultaneously meeting the challenges efficiently. New and faster strategy development will be required in many areas—such as a no-regret approach to roadmap 5G+ investments, workforce reskilling, incorporating green technology, data security and privacy, etc. Operating at higher SPE levels in an automated environment that shortens product/service realization time will require more dynamic strategy formulation and competitive evaluation paradigms.

COVID-19 has helped establish resilience as an integral part of productivity paradigms. But increased resilience can oftentimes increase costs and reduce enterprise efficiency. Digitalization reduces the negative impact of this trade-off by strongly increasing enterprise flexibility and adaptability. Tracking these metrics needs to be an integral part of any productivity paradigm going forward. TR

The rise of Satcoms in the midst of the 5G era

In the past few years, satellite communication has remained standalone technology, independent of mobile networking. But today, it has come a long way improving its technical performance and capabilities as well as becoming much more competitive to match terrestrial offers. The next generation of satellites – built from 5G architecture – will integrate with networks to manage connectivity to cars, vessels, airplanes and other IoT devices in remote and rural areas. The emerging 5G vision opens a new chapter in communications and offers the possibility to consider satellite communication alongside and in combination with terrestrial solutions.

5G satellite communication market is expected to witness a high growth, owing to the increase in the number of communication satellite constellations for the support of 5G systems across the globe.

Furthermore, the emergence of 5G satellite communication services for IoT is expected to gradually increase the demand for 5G satellite communication across the world. Having billions of IoT devices poses a significant operational challenge. To combat on-going security vulnerabilities, devices need constant updates and future 5G devices will require an efficient distribution of data on a global scale. With wide coverage and broadcast capabilities, satellites are well-positioned to support IoT. They can offer shared uplink connectivity for a massive amount of IoT devices and provide data aggregation.

With an integrated satellite-terrestrial solution, the additional capacity can be used as an IoT backup or supplementing congested data traffic. This permits higher peak rates and more reliability in massive machine communication.

In addition, the increasing demand for satellites for different business verticals and the need to resolve the bandwidth problem in the current network are some of the major factors expected to create lucrative opportunities for the global 5G satellite communication market in the coming 10 years.

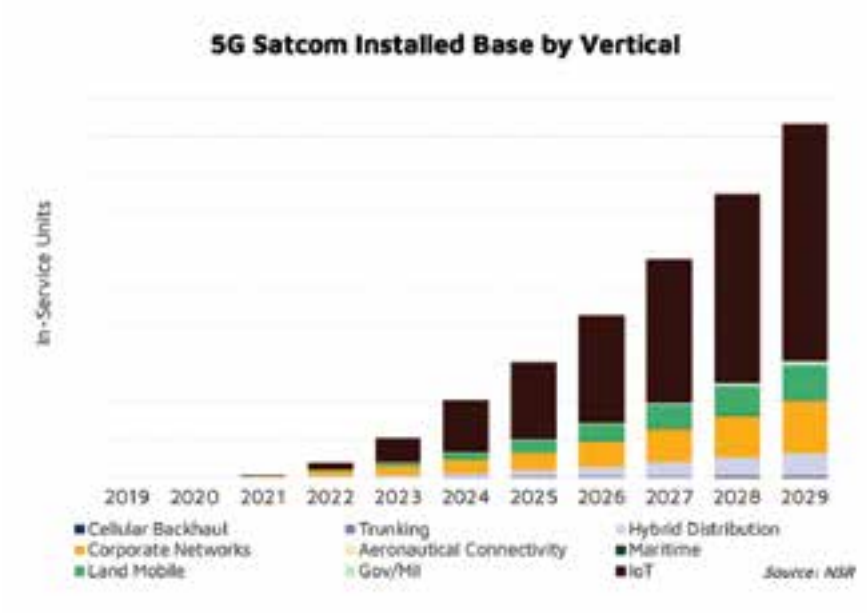
The Global 5G Satellite Communication Market report projects the market is expected to grow at a significant CAGR of 28.91% on the basis of value during the forecast period from 2021 to 2030. This global market has gained widespread importance, however, issues related to the spectrum allocation and backhaul connectivity are some of the factors that are restraining the market growth.

Global 5G satellite communication market segmentation

The 5G satellite communication market is segmented on the basis of orbit (GEO, MEO, and LEO), spectrum, end user, satellite solutions, and region. Traditional communication satellites are geostationary and have been in orbit for more than 50 years. GEO satellites weigh more than 1000kg and operate 36,000 kilometers above the earth. These satellites remain in a fixed position relative to any position. Despite Earth's orbit, this allows ground-based antennas the ability to point directly at the satellite, in a fixed position.

In contrast, Low Earth Orbit (LEO) satellites are miniaturized, orbiting versions that operate between 500 and 2000 kilometers above Earth's surface and weigh under 500kg. Due to its low orbit, latency is significantly reduced as the satellite is better positioned to quickly receive and transmit data. Unfortunately, this also creates a smaller coverage area so LEO satellites continuously hand off communication signals and traffic across a constellation of satellites. This ensures seamless, wide-scale coverage over a pre-defined geographical area.

The Low Earth Orbit (LEO) segment is expected to dominate the global 5G satellite communication market in 2021 and is anticipated to maintain its dominance throughout the forecast period 2021-2030.



Role of satellite in 5G

- Satellite can play major roles in 5G within different areas, namely:
- Coverage expansion
- Backhauling services to fixed or moving base stations
- Complementing connectivity for mobile devices (ships, vehicles, trains, planes)
- Multi-gigabit per second data rates for enhanced mobile broadband
- Offloading a temporarily congested network
- IoT/M2M
- Spectrum sharing
- Resilience, security and availability
- Providing emergency response/ disaster recovery communications

However, its development is not without challenges such as latency minimization, spectrum scarcity, energy consumption reduction, localization and integration issues, QoE guarantee, and supporting multiple heterogeneous services such as IoT/ M2M and high rate video services.

The demand for satellite data services is increasing significantly, owing to increasing interest from the private sector toward the space industry. In June 2020, SpaceX launched 58 Starlink satellites and 3 small Earth-observation satellites. These 3 satellites and 12 other satellites provide views of earth's surface that are consistently covered in sunlight. Moreover, in June 2020, Hong Kong Aerospace Technology Group (HKATG) signed a strategic partnership agreement with China Great Wall Industry Corporation (CGWIC). The cooperation includes joint development of the Golden Bauhinia constellation system design, R&D, satellite design, testing, launch, and in-orbit delivery. Such increasing participation of private players in satellite launches and increase in the number of satellites in the earth's orbit enable satellite data and imagery service providers to provide their solutions for commercial purposes. For instance, in 2018, more than 90 satellites were launched for commercial purposes by the U.S., Italy, China, Japan, and the UK.

In Africa for example, over 30% of the African population live in landlocked countries, many in remote rural areas. Millions of Africans therefore experience significant challenges with access to reliable connectivity every day. According to Northern Sky Research (NSR) countries in sub-Saharan Africa are increasingly connected to the mobile internet. However, in 2019, there were 520 million people that did not use mobile internet and another 270 million who did not live within the footprint of a mobile network. Simply put, better solutions are needed as the number of connected devices and demand for bandwidth-intensive applications continue to soar across the continent.

In response to the ever-present digital divide in not only Africa, but the world, SES, the leader in global content connectivity solutions, has developed O3b mPOWER – a revolutionary non-geostationary orbit (NGSO) satellite-enabled communications system operating 8,000km away from earth. Due to launch in Q4 of 2021, O3b mPOWER will boost connectivity across the region by delivering connectivity services ranging from 50Mbps to multiple gigabits per second, offer unprecedented flexibility and reach, making it possible to optimize a network's ability to scale to cloud, deliver bandwidth when and where it is needed, in real-time, using the flexibility of the system and the software-based architecture, support a massive increase in the backhaul capacity for 4G and 5G deployments and enterprise applications, allow for digital transformation, rapid cloud adoption and e-banking services; and more importantly will work towards tangibly bridging the digital divide.

Satellite communications is part of everyday life and has enormous benefits including reaching otherwise unreachable, underserved rural communities. TR

PCCW Global expands its SD-WAN services portfolio

PCCW Global, a leading telecommunications service provider, has expanded its advanced Software-Defined Wide Area Network (SD-WAN) services to include both Universal Customer Premise Equipment (uCPE) and Network Function Virtualization (NFV) technologies, supporting companies that plan to leverage the benefits of digital transformation and cloud-based services.

Businesses around the world have been migrating from traditional WAN networks that connect regional offices to more advanced SD-WAN infrastructure that improves user experience by avoiding backhaul traffic and simplifies management with a centralized single portal to manage branch connectivity. In addition, dynamic SD-WAN network technology is able to integrate and serve multiple types of connectivity, including traditional MPLS, standard Internet and mobile networks. As a result, SD-WAN networks are also more cost-effective – fully integrating available links and offloading non-mission-critical applications to Internet-based connections.

PCCW Global has now expanded the inherent advantages of its SD-WAN service by including uCPE and NFV technologies, bringing a new level of user experience, enhanced security, automation and simplified management. PCCW Global's flexible uCPE hardware provides additional advanced networking options and the hosting of related NFV technologies that are able to replace physical devices such as firewalls and routers. In addition, the new services have the potential to greatly improve provisioning lead times as well as the reduction of logistical costs. Moreover, users are able to avoid the expensive up-front investment in their own complicated hardware infrastructure.

Various uCPE and NFV combinations offered by PCCW Global can fully address customer challenges during SD-WAN deployment and are available for customer procurement:

- uCPE with SD-WAN
- uCPE with SD-WAN and Virtual Router
- uCPE with SD-WAN and Virtual Firewall
- An option to provide uCPE with SD-WAN network functionality, where the customer chooses and supplies their own NFV service, will be made available later this year

PCCW Global also provides a dedicated team with the technical expertise to support customers throughout their digital transformation journey, both before and after network migration, enabling them to focus on their core business.

Users are able to leverage PCCW Global's SD-WAN gateway, which is hosted in a fully managed digital solutions platform and is linked to the company's Tier 1 international MPLS and global Internet network. As a result, users also benefit from better reliability and performance to both cloud and remote service sites across a true end-to-end managed global SD-WAN solution.

Jordick Wong, senior vice president, innovation, planning & procurement, PCCW Global, said, "We are excited about the expansion of our SD-WAN services to include uCPE and NFV technologies and the benefits they will bring to our users. Our service already brings a true end-to-end managed global SD-WAN solution that is fully supported by our international network."

Facebook's Echo and Bifrost: The first transpacific subsea cables

Advancing connectivity between the Asia-Pacific and North America regions, Facebook is set to build two new subsea cables — Echo and Bifrost — with leading regional and global partners.

These subsea cables will connect Singapore, Indonesia, and North America, making it the first transpacific cables through a new diverse route crossing the Java Sea. Moreover, it will increase the overall transpacific capacity by 70 percent and deliver increased internet capacity as well as network redundancy and reliability.

The demand for 4G, 5G, and broadband access is rapidly increasing within the Asia-Pacific region. Thus, Echo and Bifrost will support further growth by ensuring a widely accessible internet for people and businesses.

According to Facebook Vice President of Network Investments, Kevin Salvadori, Echo is being built in partnership with Alphabet's Google and Indonesian telecommunications' company XL Axiata while Bifrost is being done in collaboration with Telin, a subsidiary of Indonesia's Telkom, and Singaporean conglomerate Keppel. These two are set to be completed between 2023-2024.

"These new projects add to our foundational regional investments in infrastructure and partnerships to improve connectivity to help close the digital divide and strengthen economies," the American technology conglomerate declared on its statement.

As of the moment, the two new ventures are still subject to regulatory approvals.

BICS accelerates 5G roaming service enablement in Europe

International communications enabler BICS has launched 5G data roaming services between the Austrian operator, Three Austria, and Swiss telecommunications company, Sunrise UPC.

The announcement heralds a major advancement in the roll-out of global 5G roaming within Europe. The service leverages BICS' 5G global IPX network to provide secure, reliable, ultra-low latency 5G data connectivity to subscribers, with download speeds multiples times faster than those of previous 4G roaming.

Leading the way in global cross-border 5G deployment, BICS was the first to launch 5G intercontinental roaming and enabled Europe's first 5G roaming service in 2019. The communications enabler also announced the addition of borderless 5G capabilities to BICS' SIM for Things solution at MWC Shanghai this year. The BICS network offers the largest global reach of IPX direct destinations, facilitating the speedy implementation of the next-generation service.

Frederic Salmon, Chief Commercial Officer, BICS said: "By enhancing 5G inter-operator connectivity, BICS is fully supporting mobile operators in their post-COVID growth strategies through new technology rollouts. 5G deployment is ready for a return to growth. 5G roll-outs are advancing at a faster rate than seen with previous mobile connectivity generations. Leveraging our unrivaled global IPX network reach, BICS can help operators harness the power of new 5G use cases across the consumer and enterprise markets, by providing borderless, next-generation connectivity for data-hungry subscribers, companies and devices."

Simone Keglovics, Senior Head of Wholesale, Three Austria added: "For us as an Austrian operator in the heart of Europe, excellent roaming services are an important part of our portfolio. Therefore, we are proud of our rapid rollout of 5G high-speed data roaming solutions."

Elmar Grasser, CTO of Sunrise UPC commented: "The multiple benefits of 5G are more and more important for customers also across the borders. Thanks to BICS roaming services, the Sunrise roaming customers now benefit from an outstanding 5G mobile network in Austria and Austrian customers use the fastest and most reliable 5G network in Switzerland. Thanks to BICS we are offering our customers an increased borderless 5G experience."

Telecom Egypt plans launching HARP, a new subsea system circling the African continent

telecomegypt

Telecom Egypt, Egypt's first integrated telecom operator and one of the largest subsea cable operators in the region, announces its plans to launch Hybrid African Ring Path (HARP) by 2023, a new subsea system that will outline the African continent, forming the shape of a harp. It will connect coastal and landlocked African countries to Europe through the company's widespread terrestrial and subsea infrastructure. Through HARP, Telecom Egypt will offer a wide range of capacity solutions, up to dark fiber, based on a layer two and layer three architecture that can connect multiple points on the system to one another.

The system will connect Africa's East and West bounds to Europe, from South Africa to Italy and France along the continent's East Coast, and to Portugal along its West Coast. Highly reliable terrestrial routes will connect the landing points within South Africa, Europe, and Egypt, forming a complete ring around the continent. The HARP system will leverage its diverse and resilient subsea segments to branch out to multiple potential landing points.

HARP's planned routes will cross the Sinai Peninsula in Egypt, with multiple ring protection topologies, and will extend to include premium routes on both banks of the Suez Canal. Sharm Elsheikh, located at the southern tip of Sinai, will serve as a new landing point and will be connected to coastal cities on the Gulf of Suez, forming a hybrid terrestrial and subsea fiber connectivity solution between landing points in Egypt.

Adel Hamed, TE's Managing Director and Chief Executive Officer, commented: "I am very proud of the upcoming launch of this new system, as it will provide seamless connectivity services to the African continent by integrating Telecom Egypt's current and planned projects to offer end-to-end connectivity solutions. HARP will enable Telecom Egypt's plans to establish open points of presence in various new locations in Africa and Europe to serve its enterprise and wholesale customers. It will also support the digital transformation efforts exerted throughout African nations, and expand the company's international footprint."

IoT in the 5G era: Connectivity to the next level

"We have a deep need and desire to connect. Everything in the history of communication technology suggests we will take advantage of every opportunity to connect more richly and deeply," says Peter Morville, president of Semantic Studios.

Being connected is an essential thing to do in modern society. In a world striving to be smarter and more responsive than ever, merging the digital and physical universes is made possible. This is how the Internet of Things (IoT) entered into the technological scene.

According to IDC, there will be 41.6 billion connected IoT devices by 2025. These "things" — from something minuscule to something immense — all collect and share data, forming a digital intelligence.

Yet, at the core of creating a vast and reliable IoT network lies significant issues like scalability, latency, security, and network reliability. With the proliferation of the fifth-generation (5G) technology, IoT is deemed to be one of the important use cases of this innovation.

Let us understand how IoT in the 5G era will translate to the next level of connectivity.

Impact of 5G on IoT

5G plays an important role in realizing the full potential of IoT. Currently paving its way to commercial availability, 5G will be at the forefront of IoT networks when it expands globally in the next five to ten years.

According to Strategy Analytics, 5G provided less than 1 percent of IoT connections in 2020. By 2030, this proportion is expected to surge and achieve cellular IoT connections of roughly 40 percent.

Without a doubt, 5G will enable people to control more devices remotely in applications where real-time network performance is critical. Moreover, the new 5G NR air interface can further enhance OFDM to deliver a much higher degree of flexibility, capacity, and throughput.

Data-transfer speeds: By providing faster download speeds, 5G can send data to and from 1 million devices per square kilometer, compared to

capacity

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100,000 devices per square kilometer using 4G. These devices are not just smartphones and tablets, but also industrial sensors, wearables, medical devices, and autonomous vehicles.

McKinsey reported that globally, every second, another 127 devices are connected to the internet. With this in mind, the exponential increase in connectivity 5G promises to deliver enables a single-use device to conduct digitally-automated services.

Reduce transmission delays: With the ability of a 5G network to handle more connected devices, faster response times and higher reliability will cause fewer delays — providing a more immersive experience.

Low latency is ideal for machines that drive themselves and time-sensitive actions that should be delivered immediately. Hence, a 5G network would optimize the delivery of huge volumes of changing data in real-time, a capability that no other technologies have.

Network reliability: Imagine how much data all IoT devices produce and how reliable a network should be to handle all of these. That is why in addition to the increase in speed, 5G networks will operate more reliably, leading to the creation of more stable connections.

Having reliable and stable network conditions is extremely important for IoT, particularly for connected devices like locks, security cameras, and other monitoring systems that depend on real-time updates.

High density: In particular, 5G can support Narrowband IoT (NB-IoT) connections. It is based on a low-power wide-area network radio technology standard that supports a range of cellular devices and services.

5G can work both ways — it could serve deployments of fewer devices that need lots of bandwidth and support a huge number of devices at the same time in a specific range. The latter is made possible as 5G has a connection density that is about 500 times higher than 4G.

An interconnected society: Smart cities

Up until today, LTE is the most popular and most-used network, but as the future unfolds, LTE will not suffice to meet the standards and expectations of new devices. LTE was optimized for smartphones, whereas 5G will be the mobile standard to connect all "things".

"Massive machine-to-machine (M2M) communication combined with 5G's coming incorporation of NB-IoT capabilities could further encourage IoT deployments," according to Bill Menezes, the director analyst at Gartner. This includes smart cities that face less scalability with other mobile wireless technologies such as 4G LTE or Wi-Fi.

In many aspects of our lives, we want accessibility, convenience, and security. In response to this, 5G and IoT can create smart city networks on which new applications and services can enhance every resident's life. For example, in an IoT-equipped city powered by 5G, a person who is driving to a concert can receive real-time notifications of available parking slots while en route.

There are essential elements necessary for thriving smart cities but on top of it all is pervasive wireless connectivity. With 5G, the focus will be on extreme simplicity and low-power consumption to ensure longer operation time and broad coverage for hard-to-reach locations. In this way, 5G essentially removes one of the brakes on the development of the IoT and rather drives it further for mass adoption.

In the UAE alone, the pursuit of sustainability roadmaps and the transformation of the urban landscape are harnessed by various technologies including IoT and 5G. Several smart cities, including Masdar City and The Sustainable City, have already been developed while Saudi Arabia's "The Line", which is a part of the billion-dollar megacity development called NEOM, was unveiled as part of its Vision 2030.

With connectivity at the heart of industry transformation, 5G will have a key role to play for IoT. Sooner than later, staying connected will become easier for everyone. The interconnectedness among humans and the Internet — which is already prevalent — will evolve into a much purposeful and practical one.

See yourself in the middle of a crowded area and just think of the many possibilities that could happen if you can connect to anyone or anything at your fingertips. Taking this into account, the next level of connectivity we will have will bring an enormous influence on how we will live, play, work, and decide in the years to come. TR

5G and IoT can create smart city networks on which new applications and services can enhance every resident's life

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Enabling robust networks for 2021 and beyond

The trend of remote work and online classes is not going to end soon. The latest figures showed that during October and December 2020, over 6 million desktops, notebooks, workstations, and tablet devices were brought into the Middle East. This is just an indication of what the future of the work-life scenario is going to be. The pace of change witnessed by the world in the past year has necessitated the need to introduce and evolve services to align network capacity with demand elastically.

The role of the service providers in the region in providing exceptionally good telecommunication services despite a sudden and massive demand for capacity cannot be overlooked at any cost. However, as the workloads start to pile up for the networks, the need for capacity, low latency, service velocity and elasticity will have to be bolstered by the operators. The year 2021 and beyond will enter into a new and challenging area of broadband capabilities to act as the enabler for operability in an increasingly connected world where connectivity services will be needed at an unparalleled measure. Preparing for the future, tech giants like Google are already collaborating with their partners to develop telco cloud reference architectures and integrated

solutions for 5G deployment across multiple networks and edge locations.

Solutions for 2021 and beyond
Each operator will inevitably have a unique set of network requirements to fulfill. However, the following solutions will have an overarching effect in addressing the urgent needs of the industry globally.

Increased upstream capacity
As witnessed in 2020, more bandwidth utilization upstream and downstream is important for business models to survive. A proper allocation of spectrum to provide more upstream capacity to suit applications such as video conferencing, video sharing, remote patient monitoring, etc. is a must. Operators may expand upstream capacity by both mid-split and high-split approaches. The mid-split option enables the operator to retain legacy equipment while increasing upstream capacity. However, it may fall short of upstream throughput. The high-split option can deliver up to 1 Gbps upstream; however, it may necessitate the replacement of some network equipment.

Distributed access architecture (DAA)
As the need for bandwidth continues to grow, strategies for adding capacity, involving node splits and adding DOCSIS channels, in the long run, will not work, according to experts.

To unleash the potential of 10G, capacity needs to be added at a higher rate. Instead of bringing fiber deeper into the access networks to meet the demand for bandwidth capacity, some operators are looking at the distributed access architecture (DAA) option. By transferring access hardware to hub sites or into the plant from the headend, DAA provides many benefits to cable operators, including reduced operational costs and bandwidth growth.

Virtualization of headend

The rigid, hardware-based infrastructure in the cable headend does not provide the elasticity that is becoming increasingly essential to match capacity with demand.

Cloud-native virtualization is the facilitator of elasticity and agility. Because they rely on software, continuous integration and continuous delivery and DevOps, Cloud-native architectures efficiently improve service speed. This versatility of NFV enables teams to deliver software changes regularly, securely, and reliably.

5G densification

Widespread 5G rollout will require network operators to come up with cost-effective solutions for network densification to deliver the speeds and latency that come with a 5G mmWave spectrum. Increasing the number of antennas and small cell sites as well as upgrading to sector-splitting and massive multiple-input/multiple-output (MIMO) technologies are some of the options network operators can significantly increase upstream and downstream capacity.

Passive optical network (PON) solutions

FTTx implementations via PON solutions provide robust, cost-effective, and scalable migration paths for symmetrical and multigigabit services to residential and commercial customers. The reduced cabling infrastructure (no active elements) and flexible media transmission attributes of passive optical networks have made it an ideal fit for home internet, voice, and video applications. PON solutions can be deployed in centralized or distributed architectures. Additional applications that are well suited to passive optical networks include college campuses and business environments.

Wi-Fi 6 and Wi-Fi 6E

As Wi-Fi 6E products begin to hit the markets in 2021, operators will need to introduce the right solutions and support the technology. Wi-Fi 6 promises higher capacity, efficiency, and performance and is gradually becoming a primary communication requirement. Taking advantage of the 1,200 MHz of spectrum in the 6GHz band, Wi-Fi 6E delivers more capacity than earlier Wi-Fi releases. Wider-channel widths allow for faster speeds and enable the delivery of deterministic, low-latency services. Service providers can offer high-performance, steady, and low-latency wireless backbone networks for homes. Devices that support this capability have already started to hit the markets.

The critical role that communication networks play in today's every aspect of life cannot be stressed enough. In such a short course of time, every industry has witnessed a compulsion to adapt to new business models to compete and exist in the market. Broadband networks are responsible for keeping the world connected and facilitating essential services, such as telemedicine, eLearning, virtual office, and others. Clearly, telecom operators are positioned in a demanding yet important role in the digital transformation journey that is encompassing every industry verticals. To maximize their services and offerings, they need to strengthen their network resources and invest in new solutions and capabilities that can transition the economy and society as a whole into the next decade and beyond. TR

Huawei reports slower growth, affirms commitment towards Asia-Pacific as a key market

Huawei released its 2020 Annual Report today. Growth slowed, but the company's business performance was largely in line with forecast. Huawei's sales revenue in 2020 rounded off at CNY891.4 billion, up 3.8% year-on-year, and its net profit reached CNY64.6 billion, up 3.2% year-on-year.

Despite operational difficulties brought about by US sanctions in 2019 and 2020, Huawei has continued to invite KPMG to independently and objectively audit our financial statements. The document produced by KPMG is a standard unmodified audit opinion. No matter the circumstances, we will continue to embrace transparency by disclosing operational data to governments, customers, suppliers, employees, and partners.

In 2020, Huawei's carrier business continued to ensure the stable operations of more than 1,500 networks across more than 170 countries and regions, which helped support telework, online learning, and online shopping throughout COVID-19 lockdowns. Working together with carriers around the world, the company helped provide a superior connected experience and moved forward with more than 3,000 5G innovation projects in over 20 industries like coal mining, steel production, ports, and manufacturing.

Over the past year, Huawei's enterprise business stepped up efforts to develop innovative scenario-based solutions for different industries and create a digital ecosystem that thrives on joint creation and shared success. During the pandemic, Huawei provided technical expertise and solutions that were vital in the fight against the virus. One example is an AI-assisted diagnostic solution based on HUAWEI CLOUD that helped hospitals the world over reduce the burden on their medical infrastructure. Huawei also worked with partners to launch cloud-based online learning platforms for more than 50 million primary and secondary school students.

With the rollout of HarmonyOS and the Huawei Mobile Services (HMS) ecosystem, Huawei's consumer business moved forward with its Seamless AI Life strategy ("1 + 8 + N") to provide consumers with an intelligent experience across all devices and scenarios, focusing on smart office, fitness & health, smart home, easy travel, and entertainment.

Huawei recognizes the importance of creating shared value for society as a whole, and is working together with partners to support broader economic, social, and environmental goals for shared progress and prosperity.

To boost the economic recovery and cultivate the digital ecosystem, Huawei launched the Spark program in Singapore in 2020 to provide technical support, funding, consulting and training for tech startups. The 5G Ecosystem Innovation Center in Thailand, supported by Huawei, has been served as a sandbox for 5G innovations in ASEAN.

To tackle the workforce challenges, Huawei has launched multiple initiatives in APAC, including the Huawei ASEAN Academy, Digital Training Bus, and Seeds for the Future program to provide learning resources and train digital talents. The tech company aims to develop at least 300,000 ICT talents over the next five years in APAC.

Nokia calls on CSPs to leverage automation

Nokia revealed that large communication service providers (CSPs) can potentially realize $850 million in annual value via cost savings and additional revenues by leveraging intelligent automation. The research, managed in collaboration with STL Partners, found that CSPs with an average revenue of $15 billion can generate an equivalent of 5.7% in annual value by automating intelligent automation into facets of their business, such as network and service operations, customer care, marketing and sales, and fraud protection.

Previous STL Partners research and the results of Nokia's survey of 100+ CSP executives from across the globe underscore the financial importance of incorporating intelligent automation into network management infrastructure.

Of the CSPs surveyed, over 40% feel they have a clear automation strategy, but only 21% of respondents noted they currently systematically track well-defined KPIs.

Further, over 70% noted they currently have a strategy to grow revenues from services that extend beyond connectivity and that they see automation as integral to delivering these services.

The survey found that operators who prioritize automation "building blocks" by defining automated domains and evaluating the importance of these domains are more likely to reduce operating costs, enable new services and faster time to market, as well as manage complexity of existing networks.

Hamdy Farid, cloud and network services head of applications at Nokia, said, "Automation is no longer a nice to have – it is essential to the efficiency and success of all CSPs, big and small. By incorporating intelligent automation, operators can not only better manage operational complexities, but unlock revenue streams from new use cases across consumer and enterprise."

Huawei leads the global telecom equipment market in 2020

Based on Dell'Oro Group's 'Total Telecom Equipment Market 2020' report, Huawei's global telecom equipment market share, improved by 3% for the full year 2020, secures its position ahead of other telcos such as Nokia, Ericsson, ZTE, Cisco, Ciena, and Samsung.

Huawei achieved a 31% revenue share in the telecom equipment market. This market particularly includes Broadband Access, Microwave & Optical Transport, Mobile Core & Radio Access Network, and SP Router & Carrier Ethernet Switch (CES). Overall, the Dell'Oro Group report estimates that this market advanced 7% year-over-year (Y/Y) for the full year 2020, the fastest pace recorded since 2011.

Nokia and Ericsson each earned half of Huawei's revenue share, sitting at 15%. ZTE has 10% while Cisco, Ciena, and Samsung have contributed under 10% per company. Despite this, the revenue rankings seem to remain stable between 2019 and 2020. Huawei, Nokia, Ericsson, ZTE, Cisco, Ciena, and Samsung are still ranked as the top seven suppliers. As a result, these major industry players account for up to 85% of the total market.

To be specific, with investments in China outpacing the other regional markets, Huawei and ZTE collectively comprise more than 40% of the global telecom equipment market. Moreover, the wireless industry was the strongest growth driver, with spend on RAN and mobile core networks surging further than before.

For 2021, the Dell'Oro analyst team is optimistic that the overall telecom equipment market would advance between 3% to 5%.

Qualcomm closes deal on NUVIA for $1.4bn

Qualcomm Incorporated announced that its subsidiary, Qualcomm Technologies, Inc., has completed its acquisition of the world-class CPU and technology design company, NUVIA for $1.4 billion before working capital and other adjustments.

Qualcomm Technologies' expects to integrate next generation CPUs across a wide portfolio of products, including flagship smartphones, laptops, and digital cockpits, as well as Advanced Driver Assistance Systems, extended reality, and infrastructure networking solutions. The first Qualcomm Snapdragon platforms to feature Qualcomm's new internally designed CPUs are expected to sample in the second half of 2022 and will be designed for high performance ultraportable laptops, according to the statement.

Commenting on the developments, Cristiano Amon, President and CEO-Elect, Qualcomm Incorporated said, "The world-class NUVIA team enhances our CPU roadmap, extending Qualcomm's leading technology position with the Windows, Android and Chrome ecosystems. The broad support of this acquisition from across industries validates the opportunity we have to provide differentiated products with leading CPU performance and power efficiency, as on-demand computing increases in the 5G era."

Meanwhile, Gerard Williams former CEO of NUVIA, who now SVP of Engineering at Qualcomm Technologies said, "We are excited to join the leading wireless innovator in the industry, driven by a common mission of inventing breakthrough technologies. Together, we will create a new class of high-performance computing platforms that set the bar for the industry."

The ripple effects of US-China trade wars and Covid19 pandemic have created a shortage in the global chipset market, resulting in huge demand for Qualcomm made chips. The chip manufacturer is reportedly finding it difficult to cater to this surging demand due to a shortage of certain subcomponents within its chips.

Qualcomm is reportedly the only chipset vendor with 5G system level solutions in both sub-6 and millimeter wave bands and one of the largest RF (radio frequency) front end suppliers with design wins across all premium-tier smartphone customers. It is one of the largest manufacturers of wireless chipset based on baseband technology. The company is focusing to retain its leadership in 5G, chipset market and mobile connectivity with several technological achievements and innovative product launches.

Huawei to provide cyber defence expertise to global cyber security platform OIC-CERT

Huawei officially joined the Organisation of the Islamic Cooperation – Computer Emergency Response Team (OIC-CERT), a leading international cyber security platform as a commercial member. In doing so, it has become the first global ICT player to join the organisation, which is currently the third-largest national CERT organisation in the world.

The OIC-CERT provides expertise in cyber crisis management and develops capabilities to mitigate cyber threats through global collaboration. As a commercial member of OIC-CERT Huawei will collaborate in an open and transparent platform with all stakeholders of the cyberspace to ensure end-to-end cyber security for member states. Huawei's OIC-CERT membership is supported by the UAE Computer Emergency Response Team (aeCERT), a department under the country's Telecommunications Regulatory Authority (TRA), and CyberSecurity Malaysia, an agency under country's the Ministry of Communications and Multimedia. The Organisation of Islamic Cooperation (OIC) was established in 1969. It is the second-largest organization after the United Nations with a membership of 57 states, covering approximately 1.8 billion people across four continents. The OIC has approved and accepted the Resolution on "Collaboration of Computer Emergency Response Team (CERT) Among the OIC Member Countries", and OIC-CERT has been granted an Affiliated Institution Status. It partners with member states and their respective national CERT to support and respond to computer security incidents.

Nokia launches fully-automated edge cloud solution for 5G use cases

Nokia announced the launch of Nokia Edge Automation, a new solution that removes the complexity of managing multiple cloud-based data centers by automating the process from a single platform.

Nokia's fully automated edge cloud solution drives operational efficiencies by enabling Communication Service Providers (CSPs) to simultaneously control infrastructure across numerous geographic locations. This includes remote site deployment, software updates, and maintenance. Automation is expected to save on CSP operating costs by approximately 30 percent.

As operators move to cloud-based solutions, they face operational issues such as having to manage hundreds of independent cloud solutions deployed across multiple sites. The solution supports site deployments by remotely detecting, configuring, and updating site hardware, switches and servers, based on the site plan. It can also upload, install and configure on-site cloud stacks, verify site deployments and configurations, as well as trigger application deployments.

Nokia Edge Automation tool simplifies the management of this process by enabling edge data planning integration, automated deployment, and mass software upgrades for any edge cloud infrastructure. It also manages the life cycle of edge site infrastructures and supports on-premises deployments for enterprise customers.

Together with the Nokia AirFrame Data Center Manager, a management system for optimizing and automating data center operations and resource utilization, the Nokia Edge Automation tool manages the life cycle of edge site infrastructures. Automation tools can be applied to multiple hardware and cloud stacks and provide open APIs for integration with existing operational tools.

Nokia edge automation offers CSPs a complete cloud computing edge infrastructure, making it possible to utilize Cloud RAN (vRAN), Open RAN, Multi-access edge computing, and RAN Intelligent Controller, as well as other virtualized software installations. As an automation solution, it also enables CSPs to provide application platforms for on-premises deployments for enterprise customers. Nokia is already engaging with major global CSPs with Nokia Edge Automation proofs-of-concept and trials to enable automation capabilities on the edge of the network.

CommScope accelerates 5G rollouts with new antenna solutions

To help accelerate 5G rollouts, CommScope announced new antenna solutions making it simpler and faster for wireless operators to build their networks.

The new antennas include:
C-Band Antennas: These antennas are designed to support three primary upgrade paths: a standalone passive or active C-band antenna paradigm; a multi-band passive antenna supporting low band, mid-band and C-band within a single housing; and a modular antenna configuration including mid-band, full-length low band arrays and a field-replaceable module that supports C-band via a 64T64R active antenna unit (AAU) or an 8T8R passive antenna. The last two upgrade paths allow operators to replace an existing multi-band antenna with one that adds C-band functionality – without any change in the size of the antenna, thus avoiding costly structural changes to the site or increases in leasing fees.

CBRS Antennas: The CommScope CBRS antenna family supports sub-6 GHz bands and features optimized pattern options, with twin-beam technology effectively doubling cell site capacity and enabling six-sector deployment at a lower cost.

360° Wind Load Reduction Design: Optimizes wind flow around, above, and below the antenna, helping operators reduce the costs and negative effects of wind loading while delivering peak RF performance. The 360° wind load reduction design will be implemented across CommScope's global antenna lineup.

700 MHz Customizable Combiners: Targeted at Europe, Middle East, and Africa (EMEA) regions, these low-band RF combiners enable operators to support new bands without adding more base station antennas and increasing tower weight. The mechanical dimensions and electrical performance of the 700 MHz customizable combiners can be precisely calibrated to meet specific RF requirements.

Nokia introduces new training and certifications for 5G purposes

Nokia announced the introduction of two new professional level 5G certifications. Industrial Automation Networks and Distributed Cloud Networks are part of Nokia's program to train and certify industry professionals on 5G technology, from network access to application management.

Since their launch last year, registrations for the first two courses in Nokia's 5G learning program totaled more than 22,000 globally across many industries. Building on this successful foundation, the new certifications highlight the potential of 5G to revolutionize industries from manufacturing to transportation, to healthcare and more. The Nokia 5G Readiness Report found that by 2030, 5G will deliver $8trn in value globally to businesses, economies and societies. Together, the Distributed Cloud Networks and Industrial Automation Networks trainings reveal how 5G can greatly improve industry performance. Its enhanced speed and ultra reliable low latency produces tangible increases in safety, productivity and efficiency.

As with the rest of the courses in its 5G Certification Program, Nokia uses compelling, real-life examples of how 5G enables Industrial Automation, such as Autonomous Mobile Robots (AMRs) in a manufacturing environment. Building on this example, the Distributed Cloud Networks course demonstrates the power of cloud computing at the edge, essential for managing the real-time pinpoint movement of AMRs through a confined manufacturing space.

As a leader in the creation of critical networks and technologies, Nokia helps individuals and businesses fully understand the potential of 5G. The Nokia Bell Labs 5G Certification Program, accessible from the Nokia website, focuses on the knowledge and skills professionals need to make the most of 5G's capabilities today and in the future. Gaining a certification by passing the associated exam will establish industry-recognized professional credentials. Two additional professional level certifications in Network Slicing and Secure Networks will be released later in 2021. Each course has approximately a 6-hour run time which can be completed at the learner's own pace.

Is it time for CSPs to transition to DSPs?

In an age of app-driven digital economy, all operations depend on agility, creativity, and reliability. With mobile devices becoming the medium of choice for surfing, buying, and other transactions, customers and businesses are going for flexible, subscription-based consumption models of connectivity.

The growth in mobile commerce is gradually becoming a global phenomenon. Analysts say global mobile commerce sales will reach $3.56 trillion in 2021.

Today's telecom industry is a highly competitive market with disruption ruling the roost, including over-the-top (OTT) players with no network of their own but riding the waves on communication service provider (CSP) networks.

As businesses of all sizes increasingly consume cloud-managed DDI and security to transform how and where they work from, CSPs need to consider revamping their network, services, and business models and reimagine their interactions with the mobile-friendly and well-informed customer base.

Rather than being just a connecting medium, service providers should embrace digital services as new opportunities for revenue growth. During the pandemic, the network operators' proactive efforts in addressing the requirements of the public and private sectors have only scratched the surface of their potential to offer various digital services and support economies. However, to become a full-fledged digital service provider (DSP), service providers need to do their fair share of strategic planning for their future.

Providing excellent connectivity and data speed should not be the only focus for operators. Especially in regions like the Middle East where telecom operators have the facility of robust network infrastructure built

on latest-generation technologies, the transition to digitization to match new customer expectations should not be a hard toil. Instead, they can turn their focus towards optimizing their investments and creating sustainable revenue streams.

Service providers need to evolve their infrastructure to provide connectivity and services for machine-to-machine (M2M) and Internet of Things (IoT) applications and identify relevant services and speed up the go-to-market time.

As working from home has witnessed a surge in the past year, faster Fibre-to-the-x build-outs are being seen as the solution for the future. FTTx access will require long-term investment and a global trend of a partnership between telcos and investors emerging to fill the financing gap.

Since the onset of the global health crisis in March of last year, approaches towards IT spending and investment in emerging and transformative technologies have changed. Private sector investment companies are entering into partnership and joint ventures with network operators and funding FTTx projects.

The enhancements of cloud and new-age technologies, such as blockchain and artificial intelligence (AI) are promising sustainable growth for service providers as legacy activities become limited.

According to a Nokia survey, the solution lies in CSPs reinventing themselves as digital service providers (DSPs). By adopting the latest advances in automation, artificial intelligence and machine learning (AI/ML), and virtualization, CSPs can manage the scope, scale, and rising complexity of their networks.

According to a GCC survey in March, 35% of regional organizations were either in the process of implementing remote-working models or had already done so, and another report showed that remote working was likely to remain beyond the pandemic, with 90% of MENA employees expecting its usage to increase between now and 2030.

The impact of the ongoing pandemic on businesses has been felt across every sector and the majority of companies are experiencing difficulties as they attempt to regain control of their top and bottom lines, according to a report by Boston Consulting Group (BCG). The report, titled 'The Five Imperatives of a Successful Digital Transformation', stresses that while recent events have propelled the urgency to transition to digital, they have also exacerbated the risks and challenges already facing organisations.

Constraints in funding, lack of proper guidance and direction, legacy infrastructure, inconsistent working processes and practices, and right talent have been cited as the primary reasons for the widespread shortcomings.

The transformation from a CSP into a DSP demands a deeper look into the changes in the organization's business, culture, and technology that drive unprecedented levels of business focus and operational efficiency across the organization.

CSPs aiming to transform into a DSP should consider the following:

- Swiftly adjust to the changing markets and customer demands.
- Offer products that are compatible with an array of devices and applications.
- Handle a supply chain instead of managing network and distribution channels.
- Leverage data available to provide the best customer experience irrespective of network or application.

Transitioning from network operator to DSP is not a cakewalk. To live up to the demands of customers in delivering the products and services, it becomes the prerogative of DSPs to understand the current transformation in the network and add digital services atop their current infrastructure or take the virtualization route.

More than one-third of the service providers interviewed in a recent study felt that the progression to a DSP would significantly improve their organizational effectiveness by motivating internal organizations to transform to meet the needs of customers.

The same study also showed that most service providers want their digital transformation to enable greater customer and competitive advantage from other service providers.

Many leading operators have already set foot on new-gen technology-centric initiatives to manage the shift toward becoming a digital service provider (DSP). However, these digital technology transformations are not without organizational and change management leadership handicaps.

According to a Gartner report on digitalization strategy for business transformation, "Eighty-seven percent of senior business leaders say digitalization is a company priority, yet only 40% of organizations have brought digital initiatives to scale."

A growing number of enterprises are moving their services and other critical applications to the cloud and adopting new digital strategies across the rest of the business. However, the gap between aspiration and accomplishment is widening for enterprises attempting a digital business transformation. CSPs need to come up with competitive products to transition from traditional legacy telecom providers to agile DSPs providing next-generation services.

We live in an unequal digital world where operators face enormous difficulty providing internet to rural areas with fewer populations but are potential economically viable markets. In times of low latency, broadband internet systems like the Starlink in the offing, it would do well for traditional CSPs to force themselves out of their comfort zones and become the real enabler of the global digital transformation efforts. TR

What drives AI domination in 2021?

"Our latest AI research shows 86% of businesses currently reaping the benefits of better customer experience through AI, and 25% of companies with widespread AI adoption expect to see the tech pay out in increased revenue during 2021. The pandemic has uncovered the value of AI, lending itself to enhancing tasks related to workforce planning, simulation modeling and demand projection," said Anand Rao, global artificial intelligence lead at PwC.

Despite the world unexpectedly facing a catastrophe in 2020, the pace of innovation and technology adoption accelerated dramatically, particularly in key vertical markets. We are now considering, more than before, new options that would enable us to be better, smarter and faster. In a technical perspective, these advancements have been driven by cutting-edge technologies including artificial intelligence (AI).

Since 1956, at a conference in Dartmouth College, where the term "artificial intelligence" was initially coined, AI has made significant strides in a span of 65 years. With many research and development (R&D) and organizations exploring AI's capabilities at a deeper level, customers and vendors began to develop more useful products powered by a machine.

Top AI trends for 2021

According to MarketsandMarkets Global Forecast, the global artificial intelligence market is anticipated to reach $190.61 billion by 2025. Hence, with this massive value, it is exciting to see what 2021 holds for AI adoption. What would drive AI domination this year? Mainly, AI is utilized for efficiency of operations and can be leveraged to improve the stakeholder experience as well.

Based on various resources, here are some of the top AI trends expected in 2021:

Autonomous vehicles

A PolicyAdvice report forecasted that roughly 33 million autonomous vehicles (AVs) will hit the road by 2040.

Taking this into account, a positive momentum is underway. Although more testing should be done to fully guarantee the passenger's safety.

AVs use a combination of sensors, cameras, radar, and AI to navigate between locations without a human driver. Waymo is known as the front-runner in the self-driving race. Moreover, its robotaxi service, Waymo One, topped 100,000 trips in 2020. Additionally, in terms of autopilot functionality in vehicles, Tesla has long been a pioneer, even naming their device 'Autopilot'.

Revolutionizing the transportation industry, even Huawei is collaborating with various car makers in building self-driving vehicles. Sooner than later, AVs will be a typical scene along the streets as AI becomes more trusted for vehicle operations.

Quantum computing

Quantum computing and artificial intelligence are both transformative. To achieve a significant progress in adoption, AI and quantum computing should work hand-in-hand. Now why is quantum computing important?

To illustrate, quantum computing could spur the development medications to save lives, machine learning methods to diagnose illnesses sooner, and materials to make more efficient devices and infrastructures.

As per Frank Feather, CEO at AI-FUTURE Inc, quantum computing will scale-up rapidly in 2021 and will start to transform AI into a truly 'advanced intelligence'. Accordingly, AI applications like machine learning (ML) and computer vision will be accelerated if run on quantum systems. This will mean faster analysis of data in sectors such as fraud detection and drug compound discovery.

Internet of Things (IoT)

Everything has changed. "Things aren't going to be the way they were," says Carmen Fontana, an IEEE member, and cloud and emerging technologies lead at Centric Consulting. The demand for interoperability is higher as organizations seek to deploy hybrid solutions.

Powering these solutions are AI and IoT. In light of the increasing number of connected devices and new opportunities for pandemic related uses and beyond, the intelligent use of data and information is necessary.

When AI is paired with IoT, simulating intelligent behavior is made possible to make informed decisions not impacted by human factors. Thus, the tandem innovation of both AI and IoT causes more productivity and accuracy. Later on, it can achieve mass adoption as AI becomes more intelligent and robust when processing different variables within devices.

Cloud computing

According to forecasts by Tractica, AI will account for as much as 50% of total public cloud services revenue by 2025. In a day-to-day living, those who make use of digital assistants like Siri, Google Home, and Amazon's Alexa may not realize that they are utilizing AI and cloud computing together.

It is undeniable that in many ways, AI and cloud computing make the perfect match for data-driven innovation. Especially in a world where data is the new oil, AI's cognitive capabilities and machine learning thrive, become scalable, and quickly accessible in a cloud environment.

On a business perspective, AI capabilities are working in the cloud computing environment to make organizations more efficient, strategic, and insight-driven. With more and more companies embracing cloud-based solutions, many will adopt AI to make smarter and more precise deliverables.

Natural language processing

NLP is the future of business intelligence. As a revolutionary technology in the field of AI, by 2025, the global NLP market is expected to reach over $34 billion. In detail, this technology allows for communication via speech, text, and messaging.

Among its widely-used applications include chatbot technology, speech recognition, spam filters, and machine translation. In line with this, NLP can be applied in various areas including recruitment, advertising, customer service, healthcare, as well as market intelligence.

Alongside the rise in smart device usage and adoption of cloud-enabled solutions, NLP-based applications are expected to unleash its full potential in the coming years. As businesses get affected by the COVID-19 pandemic, the NLP space remains a strong backbone of AI.

These trends are expected to drive AI domination in 2021. Aside from 5G, AI adoption is one of the most anticipated technological breakthroughs this year. It is inevitable that intelligence machines would influence nearly every facet of our lives to help improve efficiencies and augment our human capabilities. TR

The global artificial intelligence market is anticipated to reach $190.61 billion by 2025

Reliance Jio increases spectrum footprint by 55% in India

Reliance Jio Infocomm Ltd (RJIL) announces that it has successfully acquired the right to use spectrum in all 22 circles across India in the recently concluded spectrum auctions conducted by Department of Telecommunications, Government of India. Through this acquisition, RJIL's total owned spectrum footprint has increased significantly, by 55%, to 1,717 MHz (uplink+ downlink). RJIL has the highest amount of sub-GHz spectrum with 2X10 MHz contiguous spectrum in most circles. It also has at least 2X10 MHz in 1800 MHz band and 40 MHz in 2300 MHz band in each of the 22 circles. RJIL has achieved complete spectrum derisking, with average life of owned spectrum of 15.5 years. RJIL's spectrum has been acquired in the most cost efficient manner with an effective cost of Rs 60.8 crore per MHz.

With the enhanced spectrum footprint, especially contiguous spectrum, and pan-India infrastructure deployed, RJIL has enhanced network capacity to service its existing users as well as hundreds of millions of more subscribers on its network. The acquired spectrum can be utilised for transition to 5G services at the appropriate time, where Jio has developed its own 5G stack.

Sh. Mukesh D Ambani, Chairman, Reliance Industries, said, "Jio has revolutionised the digital landscape of India with the country becoming the fastest adopter of Digital Life. We want to ensure that we keep on enhancing experiences, not only for our existing customers, but also for the next 300 million users that will move to digital services. With our increased spectrum footprint, we are ready to further expand the digital footprint in India as well as get ourselves ready for the imminent 5G rollout."

MTN Nigeria allocated additional spectrum by the NCC

Telecommunications group MTN Nigeria has acquired an additional 10 MHz spectrum in the 800 MHz band from Intercellular Nigeria for an undisclosed amount. The Nigerian Communications Commission (NCC) has approved the transaction and assigned the frequency to MTN Nigeria. According to the company, this acquisition will significantly improve customer experience, in line with our commitment to deliver excellent service quality to our subscribers. Commenting on the acquisition, Karl Toriola, Chief Executive Officer, MTN Nigeria said, "Through this acquisition, we will be better positioned to support the deepening of broadband penetration in the country. The added resources will also greatly impact our customers' experience providing even better internet connectivity. It is our goal to keep finding ways to grant everyone access to a modern connected life."

SES Networks partners Dwi Tunggal Putra to provide high-speed broadband to Indonesia's rural villages

A recently signed partnership agreement between Dwi Tunggal Putra (DTP) and SES Networks is enabling residents of 158 villages in remote parts of Indonesia's West Java Province to access crucial online resources such as educational content, as well as unlocking the potential of the region's digital economy.

The Smart Village project, spearheaded by Indonesia's telecommunication and information accessibility agency, Badan Aksesibilitas Telekomunikasi dan Informasi (BAKTI), aims to bridge the digital divide and bring much-needed e-government and other essential services to underserved rural communities of Indonesia. Under the multi-year agreement, DTP will be using high-throughput capacity on the SES-12 satellite to support the Ministry of Communication and Information Technology's Smart Village project and fulfil the government's universal service obligation (USO). SES Networks is already serving the BAKTI Leased Capacity Project using the SES-12 ground station in Indonesia.

A nation-wide survey conducted by the Indonesian Internet Providers Association (APJII) found that while nationwide internet penetration has increased significantly, unequal access to the internet between urban and rural communities remains an issue, with 4G still not having reached over 12,000 villages across the country. Indonesia's digital economy is already the largest in Southeast Asia and is expected to almost triple by 2025, according to a report by Google, Temasek and Bain. This is largely attributed to huge improvements in Indonesia's internet infrastructure, growth of its innovative tech companies, and the increasing reliance of individuals on the internet for socialising and entertainment. Bridging the urban-rural digital divide will help to further accelerate this growth while bringing more equitable economic growth to rural communities across Indonesia.

DTP has contracted substantial capacity on SES-12, a powerful high throughput satellite (HTS) orbiting at geostationary (GEO) orbit. SES-12 covers the Middle East and Asia Pacific region with 72 high throughput user spot beams, as well as six regional beams. Tailored for data-heavy applications, SES-12 provides cost-effective solutions for broadcasters, content operators, mobile network operators, internet service providers, enterprise, maritime, aeronautical and government customers.

Network automation & SD-WAN in the era of virtualization

The trending topic of network automation and SD-WAN will be discussed in Telecom Review's upcoming virtual panel.

Place: Virtual

27 APRIL

Capacity Middle East

This year's edition will be both online and physical. The physical part of the event will take place 18-19 May at Intercontinental Dubai - Festival City.

Place: online and physical in Dubai, UAE

23 MARCH

19 MAY

BEYOND 5G

The endless benefits of 5G to operators

Telecom Review is hosting a virtual panel discussion on how telecom operators can benefit from 5G networks.

Place: Virtual (online)

20 MAY

Latest updates on: www.telecomreview.com

GISEC

Esports, 5G streaming, 8K cameras, satellite innovations and many more of the biggest breakthroughs in broadcast, media, satellite and film! Join the full content journey from ideation to production to distribution at CABSAT.

Place: Dubai World Trade Centre, Dubai, UAE

24 - 26 MAY

Cabsat

GISEC is the region's most established and influential cybersecurity event truly representing the Arab world.

Place: Dubai World Trade Centre, Dubai, UAE

31 - 2 MAY - JUNE

Telecom Review Leaders' Summit 2021

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

Place: InterContinental Dubai Festival City and virtual

8 DECEMBER

Latest updates on: www.telecomreview.com

TELECOM Review
virtual panels

Telecom Review's virtual panels' series continues in 2021

In light of the huge success achieved in 2020, *Telecom Review announces that the series of virtual panels will continue in 2021* with new and updated topics.

The 2020 series saw the participation of top notch speakers representing the industry's leading brands and registered a record number of online viewers.

The 2021 series is set to cover the topics of:

- 5G deployment, user growth
- Capacity
- Satellite, Content & Broadcasting
- Cloud, Enterprise business
- Digital Transformation
- Cyber Security
- Fiber, FTTH

For more information on sponsorships and participation, contact Mohamed Ershad: ershad@tracemedia.info

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