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**Etisalat
Group:
Spearheading
the digital
future while
achieving
record results**

Eng. Hatem Dowidar,
CEO, Etisalat Group

The sky's the limit:

Space welcomes
Arab satellites in orbit

It's all about the chips:

Opportunities in times
of crisis

Navigating the
**data processing
highway**

Building a Fully Connected, Intelligent World



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Toni Eid,
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Digital pass: A call to the WHO

For over a year now, the whole world is grappling with the repercussions of a serious pandemic. The travel industry has been affected more than anything else. The events' business is also one of sectors that are bearing the brunt despite the organization of virtual events that have been a good solution but never an alternative to in-person events.

The talk of a global digital pass which includes our Covid19 medical records comprising of PCR tests results and vaccination update, was promising but unfortunately hasn't materialized yet.

As this is a new pandemic, confusion reigned around who is the right authority to approve this pass - is it the WHO, the IATA, or each airline in coordination with the country's health authority?

Trials were conducted between UK and Singapore flights and the Emirates and Dubai Health Authority will have their own pass soon so whereby vaccinated residents can fly without presenting any documents or waiting for confirmation ahead of travel.

The EU health chief said in statement that as of June, vaccinated travelers will be eligible to travel without having to undergo quarantines within the union countries, but strictly for the vaccines approved by the EU.

Why haven't all the efforts deployed to launch a unified global pass borne fruit?

The WHO has been very slow and this delay was pushing many local authorities to take independent actions.

The United Nations should push the WHO to take responsibility and save the economy and millions of jobs around the world whether in the airlines business, hotels or even ground staff at airports.

The technology is available and it has proven its success in global digital platforms, therefore, immediate action should be taken.

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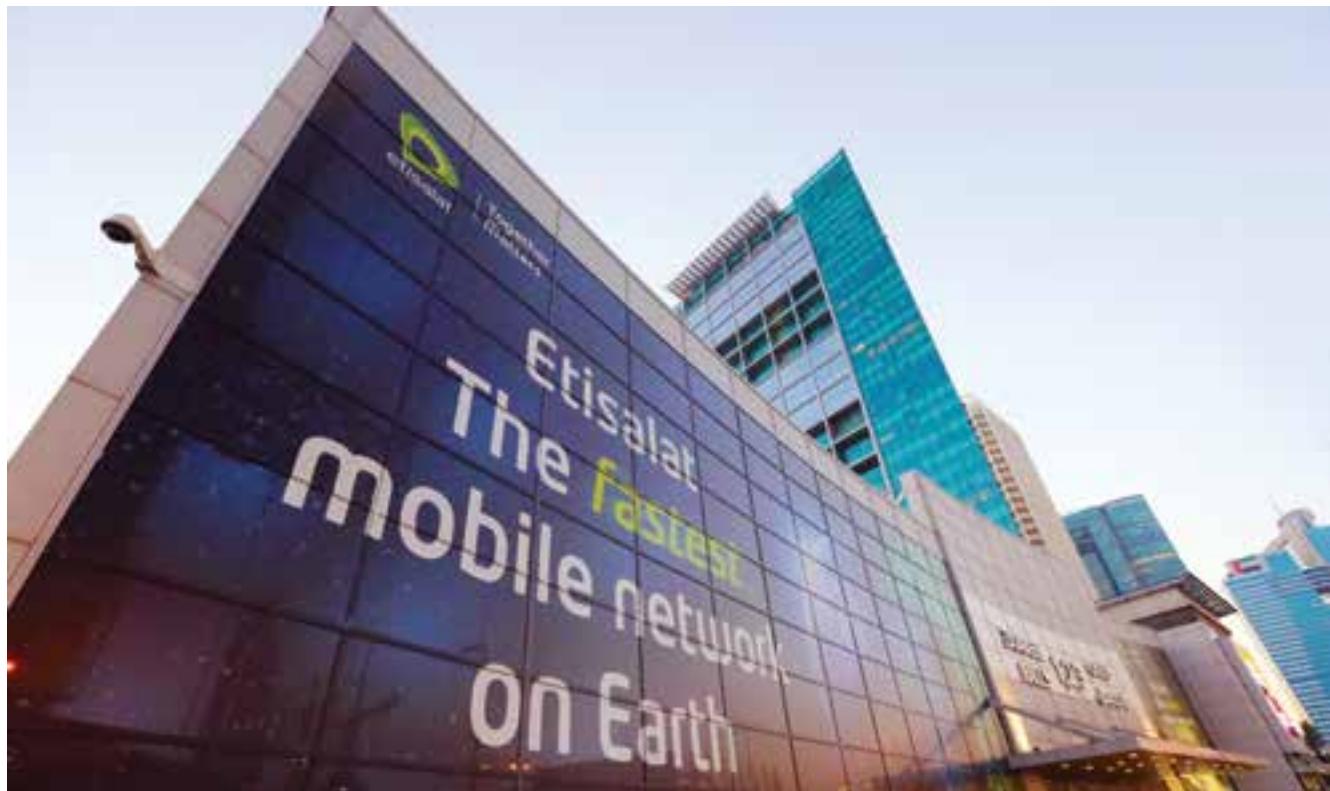
Eng. Hatem Dowidar, CEO, Etisalat Group

Etisalat Group: Spearheading the digital future while achieving record results

The telecom industry is undergoing an unprecedented digital transformation. With evolving technologies such as 5G, artificial intelligence (AI), big data, Internet-of-Things (IoT), autonomous vehicles, machine-to-machine (M2M) communication, cloud, robotics, and blockchain, as well as the introduction of new business models to cater to the changing customer demands, Etisalat Group remains at the forefront of digital innovation in telecommunications.

Focusing on end-to-end digitization, Etisalat underpins the digital revolution by adapting to an increasingly tech-reliant lifestyle, supporting businesses on the way they operate and deliver value, and providing smarter solutions toward government and cities. 2020 has been a challenging year and yet Etisalat's journey was transformational as it braces the "new normal" and accelerates further toward the future.

Among its outstanding feats are a robust financial performance, recognition as the strongest brand in the Middle East and Africa region, brand new investments for telecom infrastructure and technological advancements, and extended efforts for achieving massive digital transformation.



Etisalat recorded the highest annual results with net profits touching Dh9 billion & 3.8% YoY growth

With an international footprint that extends to 16 countries across Asia, the Middle East, and Africa, Etisalat continued its focus on enhancing the core business and exploring new growth opportunities, while being well-equipped for delivering its digital capabilities and solutions.

As a result, Etisalat's dedication to building a robust, agile, and transformative business allows a strong, sustainable, and profitable shareholder value and returns. In retrospect, Etisalat Group announced its consolidated net profit for the year 2020 of Dh9 billion, recording a 3.8% year-on-year (YOY) growth that has been attributed to strong growth in international operations. Since 2016, these results are among the highest annual profits recorded by the Group.

Eng. Hatem Dowidar, CEO, Etisalat Group emphasized that Etisalat's advanced network, recognised for being the fastest mobile network in 2020, and its ability to adapt and implement plays an instrumental role during the pandemic.

"In this time of uncertainty, our primary goal is to keep our valuable customers, employees, and society fully connected."

Following this, the unveiled Q1 2021 results display a continuation of the strong performance the company has achieved over the past year. In detail, consolidated revenues for the first quarter amounted to Dh13.2 billion, representing an increase of 0.8% YOY and 1.2% quarter-over-quarter. Moreover, the consolidated net profit after Federal Royalty amounted to Dh2.3 billion, representing a 7.9% increase YoY and 14.7% quarter over quarter, resulting in a net profit margin of 18%.

In terms of Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA), it is stable compared to the prior year with a 51% EBITDA margin, amounting to Dh 6.8 billion, representing an increase of 0.7% YOY and 7.4% quarter over quarter.

The company's generated first-quarter results are the outcome of its efforts to serving consumers in the new work-and-learn-from-anywhere scenario, according to Hatem Dowidar. Besides, the leading telco will continue to focus

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Etisalat recorded the highest annual results with net profits touching Dh9 billion & 3.8% YoY growth

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on capitalizing on opportunities and enhancing the overall customer experience while delivering long-term value for all shareholders.

In fact, during the Annual General Meeting (AGM), the Etisalat Group shareholders agreed to distribute a full-year cash dividend of 80 fils per share for the FY 2020 and additional one-time special dividends of 40 fils per share. This brings the total dividend per share to AED 1.20. Not only that, but shareholders also approved raising the non-UAE national (foreign) ownership limit from 20% to 49%.

Etisalat Group's new bonds issuance aims to maximise shareholders value by reducing the cost of funding

Etisalat Group has announced the successful completion of a bond issuance worth one billion euros to refinance the maturing bond it had issued in 2014 for the acquisition of a controlling stake (53%) in Maroc Telecom. Issued in two tranches, the first is a 7-year tranche amounting to 500 million euros with an annual yield of 0.4 percent while the second tranche is for a 12-year period worth 500 million euros with a 1 percent annual yield.

The bond issuance was very successful as it witnessed a remarkable demand from local and international investors,

reflecting investors' confidence in Etisalat Group's performance, strong financial profile, and credit ratings. Specifically, Aa3 stable (Moody's) and AA- Stable (S&P Global) are considered within the highest ratings in the industry.

More so, Morocco-based Maroc Telecom, the first global telecom operator in the country, continuously expands its 4G mobile network coverage that reached 99% of the Moroccan population in 2020. This is one of the impacts of the signed deal worth Dh10 billion dirhams between the telco and the Moroccan government in 2019 to develop telecoms infrastructure over the next three years.

Etisalat made history becoming the strongest telecom brand in MEA region and ranked among the top 5 telecom brands globally

In January 2021, Etisalat made history when Brand Finance, the world's leading independent brand valuation and strategy consultancy, named it the strongest brand across all categories in the Middle East and Africa (MEA) region. The Group scored a Brand Strength Index (BSI) score of 87.4 out of 100 and a corresponding AAA brand strength rating – the only brand in the region to achieve this rating. It put Etisalat among the top 25 brands

globally in the strongest brands index. Etisalat achieved this global brand strength through its continuous efforts and investments in accelerating value to its consumers across markets with the launch of many successful innovative global branding initiatives.

This recognition put Etisalat up 17 spots in the global 500 brand value ranking from 225th to 208th and is ranked among the top five strongest telecom brands across global markets and the strongest telecom brand in the MEA region.

For the fifth year in a row, Etisalat has retained its title of the most valuable telecom portfolio of brands, touching over AED 40 billion, including Etisalat Misr, Mobily, Ufone, Maroc Telecom, PTCL and is also the only telecom brand to retain AAA brand rating.

Commenting on Etisalat's achievements, David Haigh, CEO, Brand Finance commented saying, "When COVID struck in 2020, Etisalat led from the front ensuring business continuity, digital and innovative solutions... staying relevant and enabling the nation with the fastest network on the planet, Etisalat has earned its place as the region's 'Strongest Brand.'"

Etisalat's 5G network will play an important role in delivering the fastest,

smartest and best connectivity to Expo 2020

Focusing on its vision to 'drive the digital future to empower societies,' Etisalat has been at the forefront to bring digital ambitions to reality by spearheading the deployment of the 5G network and setting a major benchmark in the industry.

"Etisalat has become a key regional and international player in 5G especially with one of the biggest world expo powered by 5G to be held next year", said Etisalat Group CEO.

The upcoming Expo 2020 Dubai is being seen as an event that will foster global trade and bring countries together to come up with real-life solutions to business challenges worldwide. The UAE has been lauded by the participating countries for its technological infrastructure to host such massive world events. As the country's leading telecommunication company, Etisalat is the preferred premier digital services and telecommunications partner of Expo 2020 Dubai and it is prepared to deliver the 5G connectivity for the millions of delegates and visitors participating in the event.

Etisalat's services in the 5G network will play an important role in delivering the fastest, smartest and best connectivity to ensure that the massive security and logistical readiness is in place for the mega world expo.

Commenting on Etisalat's participation, Dr. Ahmed Bin Ali, Group Senior Vice President, Corporate Communication, Etisalat, commented saying, "As the Official Telecommunications and Digital Services Premier Partner of Expo 2020 Dubai, Etisalat is proud to have supported Pavilions Premiere and the debut of Terra – The Sustainability Pavilion. We delivered state-of-art telecommunications and digital services, providing a superior visitor experience thanks to the fastest network on earth."

Innovative customer service strategy and adoption of the digital-first marketplace has been the key driver for Etisalat's success and growth in leading the 5G revolution and the successful launch of global brand-building initiatives. Etisalat has tirelessly led digital innovation in the country by working on several digital initiatives in infrastructure, entertainment, and smart cities.



Etisalat driving the digital future to empower societies bringing it to the forefront of digital innovation





Etisalat's vision to 'Drive the digital future to empower societies' brings it to the forefront of digital innovation in telecommunications

Etisalat launched a slew of services in the first quarter of 2021. "Striking the right partnerships with technology leaders and entrepreneurs in close partnership with government and private sector were key factors to push us to innovate and lead in this space," Dowidar pointed out.

In February, Etisalat launched the Smiles food order and delivery services in the UAE as part of its effort to innovate and enhance customer experience. In April, Etisalat vowed to donate 5% of all food orders placed on its Smiles app, to UAE's '100 Million Meals' campaign. The donations provided food parcels for disadvantaged individuals and families across 20 countries in the Middle East, Asia, and Africa during the Holy Month of Ramadan.

His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai honored Etisalat along with other contributors for its role in raising over Dh188 million from the humanitarian campaign. The 'Fourth Industrial Revolution' solutions will be led by entrepreneurs and small and medium

enterprises (SMEs) by creating an abundance of opportunities in the UAE.

To ease the pain points of the SME sector in times of the pandemic, Etisalat partnered with Etihad Airways to provide mobile and digital solutions for the SMB and startup community. Under the agreement, Etihad and Etisalat aim to jointly design special products, offers, and activities that support SMB's to start and grow their business with the latest innovative and convenient solutions.

Similarly, Etisalat's Digital Financial Services (DFS) partnered with Al-Futtaim to enable secure and contactless payment options for eWallet customers across the country. Additionally, as part of its commitment to support and empower people of determination, Etisalat partnered with the Ministry of Community Development to launch a web extension to make accessing the web autistic friendly. Etisalat collaborated with Brussels-based IT company Bliss to come up with a web extension aimed at empowering autistic people and personalizing their browsing experience.

Etisalat has been prominent in the growing global ecosystem of telecommunication with the rapid

deployment of its 5G network that enables applications in areas such as AI, IoT, virtual reality (VR), and augmented reality (AR). It strives to address Industry 4.0 opportunities to benefit enterprises from various technological use cases in areas such as energy, healthcare, education, transport, and entertainment, providing new revenue opportunities.

In the B2B segment, Etisalat has partnered with Nokia to launch a 5G network for enhanced mobile broadband (eMBB) services, expand 5G coverage, and unlock new revenue opportunities. Under the arrangement, Nokia has deployed its AirScale radio platform, based on 3GPP 5G New Radio (NR) standards, utilizing massive Multiple Input Multiple Output (ma-MIMO) radio technology.

To support next-gen networks, Etisalat and Cisco are building the region's first open and autonomous, and secured network. Etisalat will leverage Cisco AI/ML automation to simplify Etisalat Emirates Internet Exchange (EMIX) operations with a set of innovative use cases aimed at providing intent-based and closed-loop automation solutions to the EMIX network.

Additionally, Etisalat Misr and Huawei completed the first VoLTE call using

Huawei's Virtual IMS which allow the Single Voice Core solution support for 2G/3G/LTE/5G/VoBB all in one core to avoid the complex integration, operations, and maintenance for the CS core and IMS coexistence.

Key investments for telecom infrastructure

The UAE was ranked first in the Gulf and the wider region on its telecom infrastructure, according to a United Nations (UN) e-government survey. The Telecommunications and Digital Government Regulatory Authority (TDRA) previously mentioned that telecom operators in the country have allotted a huge budget for infrastructure investment, making the UAE's infrastructure among the best in the world in terms of fiber optic services and overall network coverage.

Etisalat plays a major role in these investments. By being the first national telecom provider, initiator of the first rollout of commercial Internet services in the region, up to the first launch of commercial 5G in the region, Etisalat has been focused on establishing a well-connected network that could be the difference in achieving a long-lasting digital transformation.

In detail, the network coverage today reaches across the country with 4G LTE network coverage touching 99.70% and 3G covering 99.82%, while fiber-to-the-home (FTTH) has reached 95.7% of homes across the UAE. Along with this, network deployments in 5G reached over 35% covering the main cities in UAE.

The UAE, particularly Fujairah, is ranked as the biggest location for submarine landings in the region. Thus, Etisalat has invested in data centers to complement its telecom infrastructure called SmartHub. Known as the biggest carrier hotel, it minimizes latency and delivers outstanding end-user performance. Also, it includes direct access to a major cloud platform, Etisalat's IP network, and the Middle East's largest Internet Exchange.

Etisalat contributes to creating more value in the lives of customers and the growth of businesses with

technologies such as 5G, AI, cloud, and blockchain

The Middle East is among the leading regions for digital transformation, and Etisalat contributes to this by focusing on creating more value in the lives of customers and the growth of businesses, as well as utilizing a combination of technologies such as 5G, AI, cloud, and blockchain in empowering digital societies.

Cloud and data centers are among the innovative solutions that Etisalat Digital has to offer. Providing traditional colocation and managed services for more than two decades, Etisalat's cloud services have been operational for four years and are growing exponentially. It has 11 data centers within the UAE with 18,500 m² of raised floor and 23 MW of power, with colocation services from six data centers in Dubai, three in Abu Dhabi, and one each in Al Ain and Fujairah that are mainly used for international carriers.

At Help AG, unmatched technical expertise and industry-leading cybersecurity solutions are made available. As Nicolai Solling, chief technology officer at Help AG explained in line with the State of the Market Report 2021, cybersecurity takes collaboration amongst all responsible actors in the government and private sectors. This is a must to improve the region's digital security landscape.

Citing an example, the UAE Trade Connect (UTC) is a unique platform that will enable UAE banks and the supply chain industry to join the platform to combat fraud and duplication in the trade finance space. Banks such as Commercial Bank International (CBI), Commercial Bank of Dubai (CBD), Emirates NBD, FAB, Mashreq Bank, National Bank of Fujairah (NBF), and Rakbank can send invoice information into a private permissioned blockchain network. This information is then run through Etisalat's fraud detection system, which uses AI to check the authenticity of the invoice data.

At the same time, fostering informed decisions based on real-time information for business success, Etisalat's IoT solutions have been

strengthened through the partnership of Nokia and Mobily in deploying narrowband Internet of Things (NB-IoT) technology across its infrastructure. More than 4,000 LTE base stations have been enabled to support enhanced NB-IoT cell connectivity. This will help businesses including energy, transport, and health to deliver improved customer experience through Mobily's network.

"With communication and connectivity gaining more significance and demand more than ever during the pandemic, telcos play a critical role in closing this gap of digital readiness by becoming the engines of resilience and innovation. Moving ahead, network modernization and digital transformation play a key role in bringing this change to society," Hatem Dowidar remarked.

Taking all this into consideration, the all-inclusive digital transformation provides the telecom industry with significant growth opportunities. Standing still as a leading telecom network, Etisalat serves as a backbone of the digital economy, bringing digital transformation and innovation across markets. **TR**



Etisalat is a leading telecom player with the fastest network in the world & ranked as the strongest telecom brand in MEA





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Charles Yang, President of Huawei Middle East

ICT now a foundation to ensure sustainable development

Following a string of recent conferences and the release of its 2020 Annual Report, Telecom Review catches up with Charles Yang, President of Huawei Middle East, on plans for the region.

A s a key driver of digital transformation and larger socio-economic development, what are Huawei's current plans for the development of 5G in the region?

What we see is that the combination of 5G, cloud, and AI has become a significant development trend and a new engine for the expansion of the digital economy.

From the perspective of 5G, the Middle East has experienced the first wave of 5G construction thanks to the joint efforts of governments and operators. Huawei is one of the most important 5G solution providers in the region. We will continue to support operators in 5G construction, build the best networks, and provide

users with the best customer experiences. In addition, we will work with operators and partners to explore 5G commercial use cases. For example, in Saudi Arabia, we work with stc and Aramco to use 5G technologies to improve efficiency and reduce costs. Now we have just signed a 5G port in Oman. In the UAE, we cooperate with ADNOC in oil and gas, as well as Abu Dhabi Airports, to develop 5G use cases.

Through all this, we provide the best technologies and services to our customers, in turn promoting the development of the digital economy.

With 5G on the fast track, what do you think is the main obstacle to the growth and profitability of telecom operators today?

The situation of operators in the Middle East, especially in the GCC

region, is relatively good. Traffic across the Middle East increased approximately 40% last year due to the pandemic, because almost all activities are online now, such as online meetings, online education, and online shopping. Last year's pandemic has affected many industries, raised more demands on the ICT communications industry, and brought more opportunities as well.

But as you said, there are factors that affect operators' growth and profitability. I think it's mainly from two sides. Many countries' entire economy declined to a certain extent due to the impact of the pandemic, which may affect the profitability of operators. Second, due to the impact of the pandemic, international flows between countries are restricted, and some expatriates working in the

region left. I think this has brought some impact on the revenue of operators.

We have heard a lot of news about Huawei's contribution to the automotive business. Can you clarify the company's plans in this regard?

Electric cars and smart cars are certainly a trend for the future. In the meantime, core technologies such as artificial intelligence, 5G, and cloud services will play a big role.

To confirm, Huawei is not building its own vehicles. Instead, we focus on using our ICT solutions as a component supplier for smart vehicles, helping traditional manufacturers build better vehicles. We provide smart components to our customers, including cloud services for smart cars, smart cockpits, smart networking, and smart electrics.

Huawei's smart vehicle solutions have unique advantages. For example, we have mature full-stack ICT development capabilities in the to-business market, as well as an understanding of experience design in the consumer market. Overall, our solid understanding of consumers can be reflected in the innovation of smart car parts to make consumers more comfortable. Second, our consumer-facing design capabilities are very strong, especially process design. Therefore, we hope to make smart cars more competitive through joint efforts between Huawei and traditional auto manufacturers.

With so many projects in hand, what do you see as Huawei's contribution to enhancing network cybersecurity in the Middle East?

First, Huawei has 30 years of practice in cybersecurity. We have an end-to-end process, from procurement to R&D to production to final operations. Huawei Middle East often invites global cybersecurity experts to communicate with governments of countries to share their experience in cybersecurity governance, to help build cybersecurity processes, and to improve the cybersecurity capabilities of countries overall.

In the past 30 years, Huawei has deployed 1,500 networks worldwide, serving 3 billion people in more than 170 countries and regions. So far, no major incident related to cybersecurity privacy protection has occurred.

Huawei recently joined OIC-CERT, a leading international cybersecurity platform. This is the first time Huawei has joined the cybersecurity platform of the Islamic world, and Huawei is the organization's first leading ICT member. OIC-CERT is committed to providing expertise in cyber crisis management and continuously protecting cybersecurity through global cooperation. As a member of this organization, we will work with all cybersecurity stakeholders on an open and transparent platform to ensure end-to-end cybersecurity.

That said, I believe that cybersecurity is not the responsibility of only one enterprise, nor can it be achieved by one enterprise alone. Cybersecurity needs to be built by the whole society. I have always stressed that Huawei is willing to sign cybersecurity agreements with any country in the region.

Can you share with us your expectations for Huawei's business growth in the Middle East in 2021? In general, we are very confident in the Middle East business this year. This is because we have gained the trust and support from governments, operators, and enterprise partners in the Middle East over more than 20 years. I think operators' businesses are stable, and I think the enterprise network market will grow rapidly.

As for the impact of US sanctions on Huawei, the US has had no impact on our ICT infrastructure business locally. First, we have inventory. Second, our supply chain is diversified. Therefore, we are confident that the ICT infrastructure of telecom operators and enterprise businesses will not be affected.

We know that countries around the world have different plans to overcome the impact of the

pandemic. In this regard, what is Huawei's plan to support economic recovery in the Middle East?

Ultimately, the pandemic has accelerated digital transformation. During the pandemic, global network traffic has increased by approximately 50%. Cloud migration has become the first choice for enterprises, and 85% of enterprises have chosen cloud services. At the same time, demand for home broadband has increased by more than 20% in the last year. All these changes indicate that ICT will become a new engine of digital economic growth in the post-pandemic era.

The pandemic has also made us realize the importance of globalization and diversification for the future. To face the challenges posed by the pandemic, we must work together to build a solid foundation to ensure the sustainable development of the digital economy. **TR**

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In the past 30 years, Huawei has deployed 1,500 networks worldwide, serving 3 billion people in more than 170 countries and regions

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Saudi Arabia: 5G leader within GCC region, 127% faster 5G speed globally



In the Q1 2021 findings of the Internet performance analyst firm Ookla, Saudi Arabia is ahead of the 5G network landscape across the Gulf Cooperation Council (GCC) region and around the world. The Kingdom has the highest 5G adoption among GCC

countries and faster 5G speed than the global average.

The maturity of the 5G market is said to be measured from the ratio of samples from devices that are connected to 5G to the number of samples from all 5G-capable devices per country. Within the GCC region, Saudi Arabia had the highest ratio (83.4%) during the first quarter of the year. Qatar is ranked second (80.9%), followed by the United Arab Emirates (UAE) with 77.4%, Kuwait (68.5%), and Bahrain (57.9%). Oman, which is the most recent one to have launched commercially-available 5G this year has the lowest ratio of only 6.1%.

As a result of Ookla's speed test comparing Saudi Arabia's median download speed over 5G with an average of 5G download speeds

around the world during Q1 2021, the Kingdom's 5G emerged as 127% faster at 322.42 Mbps.

In retrospect, Saudi Arabia has a new plan to allocate 23 GHz of spectrum to boost 5G speeds and coverage. The Communications and Information Technology Commission (CITC) released the 3-year "Outlook for Commercial and Innovative Use of the Spectrum in Saudi Arabia" that elaborates how the spectrum allocation can support a wide range of technologies including mobile, satellite, and Wi-Fi.

On the other hand, the UAE records the fastest mobile speed in the GCC, with 100.99 Mbps. Moreover, mobile users with 5G-capable devices in Qatar had the highest 5G availability (38.1%).

UAE leads in world's mobile network speed race



The UAE has ranked as a leader in a global mobile index as the country with the fastest mobile network speed in the first quarter of 2021, according to the latest data from Ookla, a global leader in fixed broadband and mobile network testing applications, data and analysis.

With a download speed of 178.52 Mbps in March, the country overtook South Korea and Qatar in the mobile broad speedtest in the Global Country Mobile rankings. The UAE also overtook both countries in January and February, with download speeds

of 183.03 Mbps and 177.10 Mbps, respectively.

The Speed Test Global index, which assesses over 135 countries, compares internet speed data from around the world on a monthly basis. Data for the index comes from the hundreds of millions of tests taken by real people using the speed test every month.

Mobile network speed is regarded as a major contributing factor to the well-being, economic wealth and social prosperity of a nation. This achievement has a lot of favourable implications for an enabling environment for future aspirations, country's ICT agenda, productivity of businesses, amongst others.

This significant achievement adds one more feather to the UAE's cap, and comes at an opportune time with the recent declaration of 2021 as "Year of the 50th" as the nation celebrates its milestone Golden Jubilee.

Etisalat has contributed to the UAE ranking first in terms of mobile network speed. This is yet another milestone achievement for the UAE as well as Etisalat's testament to its relentless efforts towards its strategy and vision to 'Drive the digital future to empower societies'.

As the country's leading mobile operator and world's fastest mobile network, Etisalat is uplifting the national performance, enabling the ICT aspirations of the country's leadership.

Ookla had recognised Etisalat for being the fastest mobile network operator worldwide in 2020 providing its subscribers the most superior experience with the fastest mobile speeds from anywhere in the world.

Just recently Etisalat has partnered with Nokia to deploy 5G network, providing enhanced mobile broadband services and expanding 5G coverage and revenue opportunities. Nokia's 5G portfolio supports Etisalat's mission of driving the digital future to empower societies.

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NOKIA

Dalia Nabil, Head of Pre-sales, Cloud and Network Services, Nokia MEA

Nokia's network expertise and software solutions helping telcos carry out their 5G evolution

OSS/BSS modernization is important in the era of 5G and digital transformation. Dalia Nabil, Head of Pre-sales, Cloud and Network Services, Nokia MEA explains to Telecom Review all about the transformative impact of 5G on OSS/BSS systems and the role that Nokia is playing in that space.

5

G is a transformative technology. How will it transform and impact OSS/BSS systems?

5G, which is fundamentally different from previous technologies, is all about use cases and new business opportunities. 5G networks is a platform for value creation, to support new business models (B2B2B and B2B2C).

One of the many challenges to overcome to fully realize the future of 5G, is the complexity of the current operations and business support systems (BSS). For decades, service providers have been implementing complicated and customized layers and silos, which led to a platform far from being agile and dynamic.

With the acceleration of the launch of commercial 5G services around the

world, especially after the pandemic, expectations for new use cases and opportunities are exponentially increasing. Much of the promise of these new use cases will come with the implementation of new 5G core technologies that enhance the ability to deliver dynamic end-to-end network slicing and automated operations.

Service providers must maximize their return on investment by enabling

dynamic new business capabilities to capture every revenue opportunity brought by 5G. That cannot be achieved with static legacy business and operations support systems (OSS/BSSs), having old architectures, limited flexibility and lack of real-time monetization capabilities.

Monetization solutions must also be open to enable CSPs to digitally interact with customers and partners. In addition, business agility is required so that highly dynamic digital services can seamlessly be brought to market rapidly. All of these must be delivered with greater operational efficiency than ever to support the massive growth in data and devices at lower costs.

How important is it to modernize OSS/BSS in the 5G era? What are the challenges here?

A wise man once said, "You cannot keep doing the same things over and over and expect different results". Capitalizing on 5G opportunities will require a complete rethinking of the traditional approaches to both network and service operations, including the people and processes that power them. But that evolution should happen incrementally, with automation and AI essential to getting service providers from where they are today to where they want to be - a fully integrated, outside-in, market-driven approach to operations.

Modernization is critical to be able to dynamically turn network, technology and other assets into business. The challenges are many including:

- Legacy customized systems with ad hoc point-to-point integrations
- Complex IT architectures with no open interfaces
- Siloed organizations with manual steps and no close loop processes
- Legacy offering with existing customer base not used to digital channels
- Long time to market (TTM) in order to define new service/offering

What role does automation play in the modernization and optimization of OSS/BSS?

5G network-based services with multiple slices and diverse SLAs to

uphold will be too dynamic for static, open-loop operational systems and processes to keep up. Automation and AI need to be "designed-in" to 5G service and network operations from the start. This will help service providers with four concerns in particular: cost, quality, agility and security.

For service providers to address those challenges and automate successfully, service providers will need to put in place an automation-native architecture.

What impact does network slicing have on OSS/BSS?

In the 5G era, the network-as-platform will act as enabler of enterprise innovation – for use by enterprises to develop and deliver solutions to their own markets. By leveraging the software-based capabilities of the 5G network, service providers will create virtualized portions of the network ("slices") that they can sell to third parties who can then build 5G capabilities into their own enterprise and consumer offerings.

The service provider network will consist of many slices, each can be adapted to a different industry set of requirements in terms of latency, throughput and other parameters. Whether it is a university campus, a mining company or a multi country logistics player, each enterprise could have a "slice" of the network to deliver its use cases. These slices will then need to be orchestrated, operated, and assured in closed-loop cycles so agreed-upon service-level agreements (SLAs) are upheld.

According to Analysis Mason, enterprise-focused business use cases, such as mobile edge computing and network slicing, will require modern, scalable, real-time charging systems. Further, the report states that, "...it will be beneficial for service providers to deploy all new stacks to support these use cases rather than investing in enhancing legacy billing/charging systems."

Where is Nokia in OSS/BSS modernization for 5G networks? And

how are you addressing the security aspect?

Nokia has the network expertise, software solutions and global services to help telecommunications companies plan for and carry out their 5G evolution. Our deep understanding of 5G operations and our end-to-end 5G portfolio provide a clear path forward to connect the network to the business, monetize using new business model, adopt closed-loop processes and establish a truly outside-in approach to innovation.

Nokia has extensive references around the globe and is trusted by 270+ service providers supporting 1.8 billion subscribers for monetization and OSS. For reference, Nokia deployed 5G CHF, that is already live in Tier-1 NAM operator's multivendor 5G SA Core serving millions of customers. Other reference is with Singtel, based on a Network as a Service (NaaS) approach that provides customers with highly customizable services for a variety of 5G use cases and applications enabled by Nokia's next-generation operations suite.

Security remains a key consideration for all service providers as they move towards 5G. What's essential is that security be built into 5G services by design, not as an afterthought. It needs to be in place any time a new service is launched, or new partners and customers are connected to the network. Without it, the massive new revenue opportunities of 5G will be at risk.

There are three key things service providers would require for security operations in the 5G era: 1) a holistic security management approach; 2) implementation of the SOAR model (security orchestration, analytics and response); and 3) digital trust.

By connecting silos, enabling "cross-slice visibility", harnessing AI, SOAR systems and maintaining digital trust, service providers can ensure the highest degree of assurance for all network activities, all while relieving human beings from tasks they won't otherwise be able to keep up with in the complex, dynamic 5G environment. **TR**



The sky's the limit: Space welcomes Arab satellites in orbit

"Space is the gateway to science, and science is the driver to the future economy," said His Highness Sheikh Mohammed bin Rashid Al Maktoum, Ruler of Dubai and Vice-President, Prime Minister of the UAE.

The Middle East is known as a frontrunner for innovation, and this is not only limited to technological advancements that we can benefit from in a tangible manner. Space science and technology have become an essential field for countries seeking to develop their terrestrial infrastructures and human resources in various areas.

As a matter of fact, Arabs have invested billions of dollars in various programs that will benefit academic, technical, and economic fields. Algeria, Egypt,

Morocco, Saudi Arabia, and the United Arab Emirates (UAE) have established space agencies and operate their own satellites.

By definition, satellites establish secure and reliable communication networks and overcome connectivity gaps in remote or rural areas. The multi-billion-dollar satellite industry has seen phenomenal growth for the past decades and is anticipated to prosper further as the interest for space innovation surges.

A preview on Arab satellites
The beginning of the Arab space age can be credited to Arabsat, the

pan-Arab satellite communications organization. Founded by the 21 members of the Arab League, Arabsat – considered as the leading satellite services provider in the region – has been serving the needs of the Arab world for over 40 years.

Similar to other regions, the Middle East and North Africa (MENA) is rich in experience and unique in its perspective regarding satellites. Here are some of the groundbreaking Arab satellites launched:

Arbsat-1A. In February 1985, the first Arabsat satellite launched into orbit. This signals the Arab world's entry into space. Due to malfunction, it was soon followed by the deployment of Arabsat-1B. The latter is done alongside Saudi Prince Sultan bin Salman's historic space trip aboard NASA's Discovery shuttle.

Inmarsat GX5. Launched in November 2019, this satellite delivers roughly double the combined capacity of the entire existing GX fleet. Equipped with a significantly expanded ground station network and enhanced cloud-based processing, GX5 supports the rapid growth in customer demand for GX services in the Middle East, particularly for aviation connectivity and government/commercial maritime services.

FalconEye. Launched in December 2020 in line with the UAE's 49th national day, FalconEye is the fourth reconnaissance satellite launched by this country. Developed together with Airbus Defence and Space and Thales Alenia Space, the satellite is specifically designed for mapping, agricultural and environmental monitoring, and urban planning, as well as to support the needs of the UAE's Armed Forces.

KhalifaSat: the first Emirati satellite built from the ground up was launched into orbit in October 2018. This heralded a new era in global space exploration within the Emirates. Developed by a team of young Emirati engineers from the Mohammed Bin Rashid Space Centre (MBRSC), KhalifaSat is equipped with the latest in space and imaging technology,

intended to be used in urban planning and designing smart cities.

MeznSat: This 3U CubeSat developed by students from Khalifa University and the American University in Ras Al Khaimah was launched in September 2020. This satellite would provide data on greenhouse gas concentrations using a shortwave infrared spectrometer. It also collects data on the red tide phenomenon in the UAE.

DMSat-1: Launched in March 2021, Dubai Municipality collaborated with MBRSC to develop the Emirate's first nanometric environmental satellite that will map air quality and monitor climate change in the UAE. The data provided by the satellite will be used to find solutions to confront the challenges of urban pollution and climate change. Moreover, it explores the future environmental reality within the UAE. Thus, the launch of the satellite is part of the Dubai Clean Energy Strategy 2050 and UAE Energy Strategy 2050.

Shaheen Sat: This locally-made satellite was successfully launched in March 2021. The satellite will photograph Earth from space and track ships from low orbits. Being among the new generation of small-size satellites, it includes a high-resolution imaging telescope that provides satellite images to serve Saudi Arabia's development goals of employing artificial intelligence techniques and big data.

EgyptSat 1/MisrSat-1: This is Egypt's first Earth remote sensing satellite launched in 2007. It is currently defunct now as the contact with the satellite has been lost since 2010. On the other hand, a series of Egyptian satellites dubbed "Next" will be launched starting from December 2021.

MisrSat-2/EgyptSat 2: To demonstrate Egypt's capacity for space exploration, the MisrSat-2 satellite will be 100% manufactured locally and is scheduled for completion by August 2022. While in September 2022, the EgyptSat 2 satellite will be launched to be used in sensor applications with a photographic accuracy of two meters. This is designed in cooperation with China.

Alcomsat-1: Launched in December 2017, the successful broadcasting of public television and radio channels is made possible from the new Algerian satellite Alcomsat-1. It successfully carried out the broadcasting of five public television channels (National Programme, Canal Algerie, TVA3, TV4, and TV5) and 57 radio channels, previously broadcasted by foreign satellites.

Maroc-TUBSAT/Mohammed VI-A and VI-B: Morocco launched the country's first microsatellite Maroc-TUBSAT in 2001. Aside from this, Morocco's two earth observation satellites, Mohammed VI-A and Mohammed VI-B are the most capable optical surveillance satellites owned by any African nation. The two satellites, their launch services, and ground support, reportedly cost Morocco between 500 million and 600 million euros.

The current state of the Middle East satellite market

"The UAE's potential and varied programs in the space sector under the leadership's long-term vision can reinvigorate the rich history of Arab-Islamic scientific contributions to humanity. It is time for the Arab world to return to the age of scientific developments, achievements, and contributions for the sake of humankind's progress. Through these programs and more, we can once again welcome the Arab-Muslim nations to the forefront of scientific leadership," said His Excellency Hamad Obaid Al Mansoori, Head of the UAE Digital Government and Director General of the Telecommunications and Digital Government Regulatory Authority.

In the MENA region, there are a few organizations that provide guidance and regulate the satellite telecommunications industry. These include the ITU's Arab Regional Office (ARO) in Egypt, established in 1991; Arabsat; and the Arab States Broadcasting Union (ASBU) which give certain rights and responsibilities that are tantamount to regulation. By and large, the satellite industry is as diverse as it is complicated. In the MENA region, the satellite

communications industry is booming in terms of development due to globalization and a myriad of factors such as cultural, technological, financial, and geographical. As more satellites are launched and more services are available to a wider audience, the regional satellite regulation may very well undergo further adaptation in the current generation.

Among the key factors in the growth of the MENA small-satellite market are the increasing need for earth observation operations, growth of small satellite launch vehicles, emerging telecom sector as well as increased investment by venture firms. Additionally, climate change and rising terror threats are some of the other major factors which are driving the demand for small satellites in the region.

According to 6Wresearch, the Arab region has substantial growth prospects until 2025. The governments are taking several initiatives to upgrade the communication and navigation, broadcast, and remote sensing applications through the launch of low-cost small satellites in space. The UAE, Saudi Arabia, and Africa are the key growing regions of the overall MENA small satellite market; particularly the latter as it has relatively low connectivity rates.

Currently, leading satellite operators include the Thuraya Satellite Communication Company, Al Yah Satellite Communications Company, and MBRSC. These operators are destined to provide more advanced satellite services over the years. SES' research shows that 30% of the Middle East's population will have 5G networks by 2025. This technological advancement will affect satellite innovation in the future. Hussein Oteifa, General Manager, Sales, Middle East, SES Networks commented: "Given the diverse geographical landscape of the region, and satellite's unique ability to connect remote areas, there is definitely huge potential to integrate high-performance satellite seamlessly into 5G networks and accelerate the rollout." **TR**

Women empowerment at the heart of Zain Group's initiatives

Women are excelling in the ICT industry which proves the need to bridge the gender gap in order to give women more opportunities to prove their skills in the field. Zain Group has recently published a report entitled "Women in Tech - Bridging the Gender Gap in STEM Fields" to highlight this matter. In an exclusive interview with Telecom Review, Jennifer Suleiman, chief sustainability officer, Zain Group explains more about the report's outcomes and her influencing role as a leading woman in the ICT field.



Zain Group released its thought leadership report 2021 entitled "Women in Tech - Bridging the Gender Gap in STEM Fields."

What are the main highlights of the report? And what impact did it have on the industry?

The report focuses on exploring important issues regarding the cause, nature, and effects of the challenges faced by women as related to STEM. Zain's 2021 Thought Leadership Report provides insights on the gender gap in STEM, highlighting its impact on socio-economic development across the board.

Women account for half of the world's population and are fundamental to ensuring a sustainable future and peaceful societies. There has been some progress made towards achieving a more equitable society, however, there is still a long way to go and according to the UN, the gender

gap is considered "the unfinished business of our time."

As the number of girls gaining an education increases, disparities associated with access to opportunities, quality and topics they choose to study becomes more evident. It is imperative for girls to further develop themselves in STEM education, as careers in these areas are seen as the jobs of the future, driving innovation, social well-being, inclusive growth, and sustainable development.

Women are underrepresented in the technology sector and even though large strides have been made in STEM education, it has not translated into employment. Studies have shown that even though countries have largely invested in improving girls' education including STEM education, cultural and societal constraints have hindered this needed transition, impacting societies in a dramatic manner. This gap in STEM employment prevents



Jennifer Suleiman, chief sustainability officer, Zain Group

economies from reaching their full potential as it omits half of the population's potential and talent to contribute to the economy.

How is Zain addressing the gender gap in STEM?

Zain is continually driving equality programs, recognizing the need to push an agenda that is cohesive, inclusive, and fair to all. This thought leadership report is another tool to highlight the extent of the exclusion of women from STEM-related fields, and what is needed to close the gender gap across the region and beyond.

The company established a number of initiatives that aim to close the gender gap in STEM where it supported the Women in Data Science Conference (WiDS), which emphasized the importance of women's participation in the global digital economy. The company then committed and achieved its target of certifying over 100 women across its country operations in the field of data science and data analytics.

In Bahrain, Zain launched Girls for Tech Camp in partnership with the Supreme Council for Women and Clever Play, which is an organization that aims to inspire children's curiosity and passion for STEM. Established in October 2019, the program aims to equip 1,000 girls

between the ages 8 and 14 years with 10 hours of training in coding.

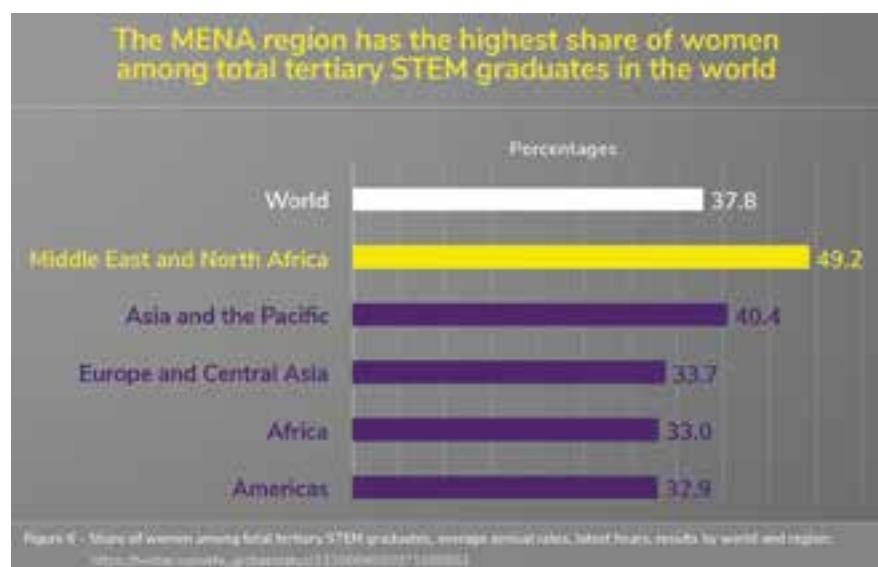
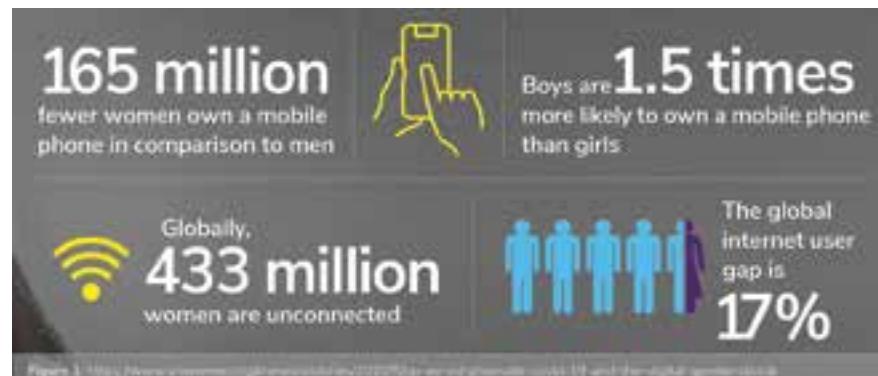
As a woman in the ICT field, what are the challenges that you faced to reach a leadership position? And how did you overcome them?

The company's evolution and its effort to continue to drive the agenda of sustainability provided the opportunity to really understand the role sustainability plays within the context of digital services and technological advancements. This gave me the opportunity to grow with the company and continued to encourage me to drive and lead in this realm. It is extremely important to set the vision of what the function does and consistently revise, adapt and evolve with the upcoming trends and ever-changing landscape. I was able to leverage on the symbiotic relationship of technology and social movements and how they help one another.

In your opinion, how can the status of gender inclusion in the ICT industry be improved?

ICT as an industry must set proper targets in place and ensure that it integrates the Sustainable Development Goals (SDGs) as a framework and guiding principle as it will ensure gender inclusion is embedded within all functions of the business. By creating a clear strategy and end-goal that actively combats gender biases will help in building an efficient ecosystem that has an inclusive, resilient, and equitable direction.

As women bring a unique perspective to problems, marginalizing them from certain fields leads to negative consequences. This risk is evident in STEM, as some technologies might be developed with unconscious biases integrated within those solutions. As such, the inclusion of women must start in the design process of products, services and policy creation. With the world migrating towards a digital economy, we must ensure that when digital solutions are created, women's perspectives and viewpoints are considered from inception.



What message can you relay to women aspiring to join the ICT workforce? And to the ICT companies in our region?

Determination and drive are key to driving change. We must work collectively as men and women to see change and development. As ICT companies, it is part of our social contract to be as inclusive as possible - not only from a gender perspective but also of people with disabilities and other marginalized communities. Companies in the region must invest in programs that promote inclusivity, monitor and assess impact, leverage on cross-sector partnerships, and spark a

movement for others to join and advocate for inclusion.

Find mentors who inspire you and nurture those relationships. Connecting with other people who have been in your position especially in the ICT industry, can really help with achieving your goals and aspirations and overcoming obstacles. ICT companies must continue to drive gender inclusion as they have an opportunity to address the digital gender divide. Technological adoption is moving at an extremely rapid pace, as such the industry must make sure that it is leaving no one behind. **TR**



Igor Gorkov, CEO, Nexign



Sergey Nikiforets, Director of Digital Services, MegaFon

How the Unified Billing facilitates digital transformation: A story from Nexign and MegaFon

As telco service providers become digital service providers, operators in the MEA region are looking for the ways to streamline digitalization and take their business to the next level. An example of such project is the Unified Billing, which has been recently completed by Nexign, the leading business support systems (BSS) provider, and MegaFon, the pan-Russian operator of digital opportunities. Nexign and MegaFon moved 8 operators' subsidiaries to a single BSS platform and ensured seamless migration of the 70 million subscriber base. Igor Gorkov, CEO of Nexign, and Sergey Nikiforets, Director of Digital Services at MegaFon, will speak in detail about the project.

What were the key goals of the Unified Billing project for MegaFon?

SN: We needed to support digital and business transformation, improve the quality of customer service and accelerate launch of new business projects. A very important goal for us was to create an ecosystem that will facilitate faster integration of the external partners. Finally, we wanted to optimize total cost of ownership (TCO) for the billing system by 20-30%.

What is particularly remarkable about the project?

IG: The joint team, which consisted of more than 1500 people, carried out a comprehensive transformation of the operator's systems. This transformation enabled MegaFon to not only improve business efficiency and enter a new phase of development, but also to strengthen customer loyalty while maintaining a high level of service in all regions. Among the major milestones were the gradual migration of all segments of MegaFon's subscriber base and creation of the product catalogue and the microservices fabric.

Could you please speak in more detail about the product catalogue?

IG: The product catalogue works as a central configuration point for all MegaFon's offerings. It supports the whole product lifecycle from the inception and adjustment of price and other parameters to the product's decommissioning. Mainly, the catalogue provides MegaFon with the information required for coordinated functioning of service and self-service systems, billing, order management, settlement payments and many more. The catalogue allows business users to manage the offerings with minimum involvement of IT staff and speed up the launch of new services.

What were the main objectives of launching microservices fabric in MegaFon? Did the company achieve these objectives?

SN: When launching new products, especially those related to partner integrations, we felt the need for

microservices to help our developers or external suppliers to promptly create and test new products. Creation of the middle layer above the billing enabled us to slash TTM from several quarters to 2-3 weeks.

As an added value, MegaFon is now able to quickly solve tasks related to piloting and testing without making changes to the core of the billing. Moreover, the middle layer created a setting for integrating new partners. The microservices fabric consolidated on this level serves as a basis for partner and customer cooperation in the joint initiatives.

What measures did you take to ensure seamless migration of MegaFon's subscriber base?

IG: The need to migrate subscribers to a new platform while still using legacy solutions until they were replaced was a challenge for us. In order to avoid disruptions in customer service, the migration of a huge subscriber base to a new platform was carried out in stages. Nexign and MegaFon moved the data of B2C, B2B, B2G and B2O customers to a new platform gradually, and the last stage of the project involved decommissioning of legacy billing systems.

SN: In the course of the project, additional tariff schemes were introduced directly into the new billing system, and the existing ones were transferred step by step. We took individual approach to the migration of the B2X segment. It was critical, because over the years, MegaFon customers accumulated a variety of parameters for product applications that were created in accordance with individual needs of customers in different regions. For the government and enterprise sector, it was important to follow SLA – otherwise, we could have simply lost these customers. The COVID-19 outbreak affected the migration of healthcare organizations: it was postponed for the final stage of the project and was led especially carefully.

What results did MegaFon achieve thanks to the completion of the project?

SN: The modernisation of MegaFon's BSS systems resulted in unification of processes for all branch offices of the company. We transitioned from a regional-based to a single shared

operation service, which resulted in the increase of its efficiency. The time to market (TTM) for various product categories reduced by 2-5 times. We also launched more than 100 new projects thanks to the microservices fabric.

How would you summarize the key advantages of collaboration with Nexign?

SN: Nexign's partner-centric approach was extremely valuable in the course of the project. Thanks to the effective collaboration with Nexign's team, the transformation of our business was manageable and stress-free. Through consolidation and upgrade of our systems, Nexign helped us achieve faster go-to-market time for new products and brought measurable value to our business.

How can results of Nexign's collaboration with MegaFon be applied to the MEA market?

IG: Our long-term collaboration with MegaFon involved a variety of projects, which address the challenges of CSPs globally, including the MEA region. One example is the implementation of the Policy and Charging Rules Function (PCRF). It enabled MegaFon to launch more flexible and customer-oriented pay-as-you-go tariffs, which helped the operator ensure competitive advantage and adapt its offerings to changing demands of subscribers.

In the course of the Unified Billing project, we achieved remarkable results and proved to be able to address both short-term and long-term business challenges. I am sure that Nexign's scalable expertise will benefit other telcos that are looking to develop digital services.

With a high pace of modernisation in the MEA telecommunications market, CSPs are looking for a partner to support their digital transformation. Unified and centralized product management, microservices and solutions that enable operators to offer highly personalized data plans are in huge demand. No matter whether operators need a full-stack BSS swap project or an upgrade of its core components, Nexign is ready to help them by offering future-proof solutions and enabling smooth systems modernisation. **TR**

Growth trends in fiber optic cable use

5G technology is powering the internet for the future and accelerating digital transformation through smart networks and applications albeit with loads of data generation. The advancement of these networks will drive and result in a slew of computing and technological innovation that will change the way we live and work. But before harnessing the real potential of 5G connectivity, a robust network infrastructure must be established to support billions of devices and trillions of terabytes of data that will swamp the network. A powerful force that drives the networking infrastructure is fiber optic technology.

Traditionally, fiber optic uses were basically trunk cable lines intended to carry signals to larger populated areas. However, over time, these cables have stretched their reach to the home, the building, etc., giving rise to the fiber to the x (FTTx) trend. Collaboration across the network solution ecosystem is essential for continued success in meeting diversified customer requirements with innovative solutions.

Fiber optic cables have become the strong pillars of our communication and computer networks with installed fiber optic cables carrying different types of information through tunnels, building walls, ceilings, and the sea.

Future trends of 5G will require fiber implementation

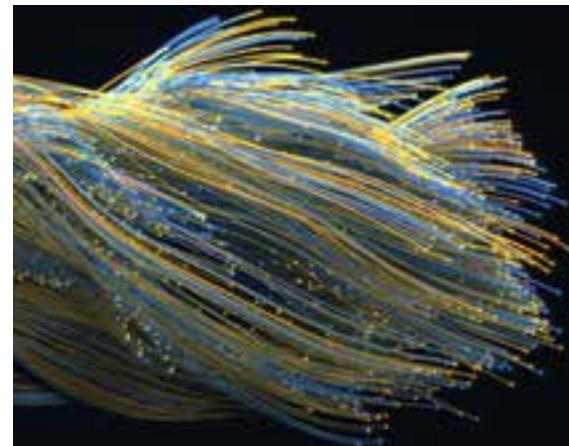
As 5G rollouts continue, regulators, policymakers, and business owners need to ensure investment in fiber deployment continues to be a priority as the foundation for 5G wireless

networks. Investments in a deep fiber infrastructure are a must for the 5G future to spur growth in business opportunities as well as employment.

One of the key players in the development of fiber network infrastructure sector is Corning Optical Communications. Recently, Corning celebrated the 50th anniversary of the company's world-class invention of low-loss optical fiber and has delivered over a billion fiber kilometers. Corning continues to invest and develop in the next generation of technology for communication networks through continued innovation in fiber.

"As connectivity needs grow across the region, operators are looking to install fiber quickly and cost-effectively, while still ensuring quality, reliable installation that causes minimal disruption in the local area, says Juan Colina, Market Development Director, EMEA for Corning Optical Communications.

With the rapid increase in demand for reliable network connectivity, Corning



has been providing communications that facilitate enterprises to operate and connect globally through innovation.

"A key innovation that Corning Optical Communications brought to the market at the end of last year was Corning's Evolv™ Hardened Connectivity Solutions with Pushlok™ Technology designed to simplify fiber deployment for all types of communications networks. Corning engineers designed Evolv HC Solutions to meet the growing connectivity requirements, especially around 5G deployments, which will require more fiber in space-constrained environments, more aesthetically pleasing solutions as connectivity elements get closer to the end users and lighter than standard non-hardened components which creates less strain in poles when optical fiber is deployed in aerial architectures. Pushlok hardened connectors are half the size of existing offerings, connecting to terminals that are up to four times smaller. The smaller size allows operators to lower their costs, speed their deployments, and stay ahead of demands for high-speed connectivity," he further elaborates.

To meet the evolving network infrastructure needs of a wide range of industries and verticals, Corning has forged collaborative partnership within the industry to keep up with the pace of growth.

"Corning had announced in 2020 that it was working with Qualcomm Technologies, Inc to develop 5G mmWave infrastructure systems for enterprises and public venues.

The combination of Qualcomm

Technologies' 5G mmWave technology leadership with Corning's industry-proven small-cell and enterprise expertise will deliver the capacity and performance benefits of 5G mmWave indoors, via development of cost effective, powerful, and scalable 5G mmWave infrastructure." Juan explains.

Fiber optic networks and their role in 5G For 5G to achieve its potential, 3 main components are a must. Firstly, it is the allocation of the C-band spectrum or broadcast networking spectrum. Secondly, increase in low-orbiting satellites and thirdly, new cell towers or upgrades to previous cell tower sites. Since 5G is based on a small cell model that brings connectivity closer to the end-user, the cell towers require a crucial fiber optic cable backbone to deliver a cohesive internet experience.

5G wireless small cells and their fiber wireline networks will have to coexist as about 11% of internet traffic is carried by wireless networks while the other 90% of internet traffic is supported and carried by the fiber wireline network. The fiber optic cables connected to the cell tower sites will allow 5G networks to deliver speeds of up to 20Gb/s and lower latency.

The bandwidth provided by fiber optic networks offers a high-speed wireline network that allows improved speed, security, and bandwidth over legacy copper systems since copper can only carry a gigabit signal about 300 feet. For its performance over long distances, fiber optic technology in long-haul networks has been used for a while as fiber can travel as far as 40 miles without losing signal strength. Many businesses prefer the fiber to the premises (FTTP) configuration to retain signal strength.

Global internet bandwidth capacity As the internet continues to grow at an exponential rate, so will the demand for increased bandwidth as a huge amount of information is transported through the internet each day. A communication infrastructure that can handle swathes of data delivery on a global scale is inevitable. Since fiber optic cables transmit information using light-based technology the speed and frequency far

outweigh the copper cables and provide significantly higher bandwidth.

Increased focus on security

In an age where data protection is seen as a critical focus area across verticals, the use of fiber optic cables offers several security benefits. Since fiber optics utilize glass to transfer the data, there is zero interference from the electrical current which makes it practically impossible to intercept any data being transmitted. Additionally, external factors such as lightning will not impact a fiber optic cable thereby minimising the risk of any data loss in extreme weather conditions.

Applications in industries

For instance, the Healthcare Mobility Solutions Market is expected to reach US\$ 272,054 million by 2027 from US\$ 57,162.65 million in 2019, according to recent market research. It is estimated to grow at a CAGR of 22.2% from 2020 to 2027. Fiber optics have been used in the medical industry for illumination, image transfer, and laser signal delivery. However, with fiber optic technology advancement, several mobile medical application use cases have been identified across a wide variety of industries. Using these mobile apps people can manage their health and wellness, promote healthy living, and gain access to useful information when and where they need it.

Similarly, in the Aerospace sector, fiber optics use is seen as a solution for increasing connectivity on commercial flights. The use of fiber optics facilitates improvements to in-flight entertainment and passenger Wi-Fi without interfering with or compromising the complex electrical data systems in place on aircrafts.

What are the 5G fiber optic cables' market opportunities?

In a bid to upgrade the efficiency of Egypt's information infrastructure and improve the internet speed, the government recently passed a project that links 1,300 villages with fiber-optic cables at a cost of about EGP 5.6bn.

As 5G rollouts get underway and data centers multiply, the trend towards

faster standards of connectivity will see demand in 25/100G optics to connect cities and premises to develop networks that meet the ever-growing data, capacity and latency demands of industrial Internet of Things and consumer applications.

In line with the UN's sustainable development goals (SDGs), organizations have taken the responsibility to strategize for connectivity improvements in wide areas, with a focus on access, backhaul and core and management, in an attempt to connect the unconnected populations by transforming telecom infrastructure.

Last year, French telecoms company Orange launched a new fiber-optic network in West Africa that will deliver superfast broadband and other high-speed telecoms services across a region for over 300 million people. The Djoliba network couples a 10,000 km cross-border terrestrial fiber optic network with 10,000 km of undersea cables to provide high-speed broadband transmission and seamless connection to Orange's international networks. Many organizations globally are already following suit in similar projects across regions.

In 2020, SuperData, a Nielsen research company, reported that the games and interactive media industry has grown 12% year-to-year, becoming a \$139.9 billion global business. With this kind of heavy data consumption trend, fiber optic networks will be crucial for increasing user base and improving monetization, in emerging markets for its future growth.

Telecom operators, infrastructure providers, and system integrators need to collaborate on new technology development and break out of the traditional means of creating and deploying telecom networks.

As technology develops and an increasing number of applications abound, without a doubt, the fiber optic cable market will witness growth. With 5G an ever-growing reality, a strong foundation in fiber optics is indispensable for its success. **TR**



Mario Hachem, CEO, Tedmob

Tedmob CEO: “We don’t just build your digital business, we accelerate it”

Tedmob has been helping its clients solve business problems for the past 6 years. With its innovative solutions, the agency has been accompanying businesses to achieve digital transformation. In an exclusive interview with Telecom Review, Mario Hachem, CEO, Tedmob highlighted the company's role in accelerating digital business.

First of all, can you explain Tedmob's scope of business and the services it provides to its clients?

TEDMOB is a digital transformation agency with 28 developers based in Lebanon. We help clients solve business problems by fusing creativity, innovation, strategy, and craft.

We are a design and technology agency that builds world class products and helps businesses and brands succeed in the digital age.

We're a new kind of agency uniting business, experience and technology. Our digital transformation services support businesses from consultancy to design, delivery and beyond.

A dedicated team of strategists, creatives and technologists work in collaboration to transform and

enhance the way people see and interact with their everyday technology.

From traditional to digital and everything in between, we cover the following industries: e-commerce and retail, telecom, e-government, banking and fintech, media and entertainment, even startups.

When was Tedmob founded? How did its services evolve with the technological evolution to meet ensuing requirements?

Founded in June 2015, TEDMOB is a dynamic, diverse and passionate place to be.

We work hard to create a place where people love to spend time, where careers flourish and everyone enjoys the best possible conditions for creating great work that transforms brands.

No matter the solution, our developers and engineers combine agile

“

We help clients solve
business problems
by fusing creativity,
innovation, strategy,
and craft

”

product development with the latest frameworks to reduce technical debt and build scalable solutions that work for users and businesses.

We create intuitive, simple, and engaging experiences for all users, on any screen size – and from any device.

Do you think the VAS market has reached a certain maturity level in Lebanon? How do you manage to differentiate the company?

So far, the expansion of the VAS market in Lebanon was noticeable. The sector has achieved a remarkable growth in the past few years, ranging from basic telecommunication services to innovative value-added services solutions (VAS).

Our technological edge, commitment to R&D, and focus on revenue-generating solutions, allow us to assist telecom operators in shaping their product innovation and help them to develop TTO products: Through The Operators!

Digital transformation has gained ground due to the COVID-19 pandemic. How can Tedmob contribute to the digital transformation of its customers?

To stay competitive in this new era, businesses and economic environments required new strategies and practices to be able to maintain sustainability during these hard times.

And this is where our role started. TEDMOB supported the digital transformation of different businesses in the pandemic and insured their consistency and operational continuity throughout the lockdown.

We made sure to put our expertise in growth marketing, tech development, user experience and UI / UX on the table to maintain and enhance their revenues.

We don't just build your digital business, we accelerate it!

We deliver rich and high quality services by combining business requirements and core coding

WE BUILD DIGITAL TRANSFORMATION SOLUTIONS FOR:

- E-commerce
- Banking & Fintech
- E-governmental
- Telecom Operator
- Insurance
- Loyalty Program
- B2B

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for the best customized digital transformation solutions.

How important is it for businesses to embrace digital transformation and innovate today?

The only option for businesses nowadays to achieve sustainability is to embrace digital transformation and the new industrial revolution: the shift towards having innovative technologies and online presence.

Most companies have started to digitize at least a part of their businesses to serve their employees and customers that face mobility restrictions due to COVID-19 pandemic.

As a CEO of a tech company I have recently stated: "We are witnessing what will surely be remembered as a historic deployment of remote work and digital access to services across every domain." **TR**

The only option for businesses nowadays to achieve sustainability is to embrace digital transformation and the new industrial revolution



Etisalat honors top sales channel partners



Etisalat honoured its top performing partners of 2020 at the virtual 'Partner Awards Event 2021'.

Each year, Etisalat holds an awards ceremony to recognise and reward the company's partners for their continued support and efforts in taking Etisalat to greater heights.

The event was held virtually this year in line with Covid-19 protocols and safety standards. A total of 45 partners were awarded from different segments mainly retailers, franchisees and distributors.

Omer Rashid, Senior Vice President, Sales Consumer, Etisalat, said, "Despite the unprecedented impact of the COVID-19 pandemic, Etisalat had a very successful 2020. Our consumer sales partners played a very important role in these achievements. The 'Partner Awards Event 2021' reaffirms our commitment to building strong relationships with our partners in keeping with our slogan 'Together Matters'."

Mohamed Al Zarouni, Senior Vice President, Distribution and Customer Registration, Etisalat, for his part, said, "We at Etisalat use this event as a platform to recognise as well as engage and motivate our

partners and frontline staff. As we go from strength to strength, we look forward to working closely together, receiving feedback to maximise sales opportunities and hurdling challenges effectively so we can make 2021 yet another successful year."

Etisalat's partners expressed their appreciation for the awards and declared their continuous support for the event, which serves as a cornerstone of their success. These entities take pride in partnering with Etisalat, one of the world's leading telecom groups in emerging markets, the fastest mobile network globally by Ookla, and the strongest brand across all categories in Middle East and Africa (MEA) region.

Held since 2016, this annual event seeks to recognise the top performing partners to drive passion, motivate and create a competitive environment.

Zain Group Q1 financial results reflect resilience despite global disruption



Zain Group, a leading mobile innovator with operations in seven markets across the Middle East and Africa, announced its consolidated financial results for the first quarter (Q1) ended March 31, 2021. Zain served 48.5 million customers at the end of the period.

Zain Group generated consolidated revenue of KD 382 million (USD 1.3 billion) for the first quarter of 2021, down 6% year-on-year (Y-o-Y). EBITDA for the quarter reached KD 158 million (USD 523 million), down 7% Y-o-Y, reflecting an EBITDA margin of 41%. Net income for the quarter reached KD

45 million (USD 147 million), down 5% Y-o-Y reflecting an Earnings Per Share of 10 Fils (USD 0.03). Significantly, Zain Group net income grew operationally by 4% Y-o-Y for Q1, 2021, when excluding the one-time gain from the sale and lease back of towers in Kuwait during Q1 2020.

For Q1 2021, foreign currency translation was impacted mainly due to the currency devaluation in Sudan from 55 to 375 (SDG / USD) during end of February, and a 19% currency devaluation in Iraq from an 1,190 to 1,470 (IQD / USD), cost the Group USD 177 million in Revenue and USD 66 million in EBITDA.

Zain Group's resilient results for Q1 2021 were achieved despite the widespread disruption in economic and social activity caused by COVID-19, further compounded by the recent and significant currency devaluations in Iraq and Sudan.

It should be noted that the impact of the pandemic on the business was minimal during Q1 2020, given its early stage of spread at the time, however in Q1 2021 the impact was more profound.

Zain Group consolidated data revenue reached USD 530 million, representing 42% of the Group's overall revenue.

Throughout the quarter, Zain Group invested USD 415 million in CAPEX (tangible and intangible) reflecting 33% of total revenue, predominantly in expansion of Fiber-to-the-Home (FTTH) infrastructure; spectrum fees; 4G upgrades and new network sites across its markets, as well as ongoing 5G rollouts in Kuwait, Saudi Arabia and Bahrain.

Kuwait witnessed impressive growth in 5G consumer and B2B customers, with Zain Saudi Arabia expanding its 5G network to over 50 cities covering all regions in the Kingdom.

Etisalat posts consolidated net profit of Dh 2.3bn for Q1 2021, up 7.9% y-on-y

Etisalat Group has announced its consolidated financial statements for the three months ending 31st March 2021.

The Group reported consolidated revenues of AED 13.2 billion while consolidated net profit after Federal Royalty amounted to AED 2.3 billion, representing a year over year increase of 7.9% and resulting in a net profit margin of 18%. The group had posted a net profit of Dh2.2 billion for the first quarter in 2020 (Q1).

Q1 consolidated EBITDA totaled AED 6.8 billion, representing an increase of 0.7% year over year and resulting in EBITDA margin of 51%.

Subscriber base reached 12.4 million in Q1 of 2021 in the UAE, while the aggregate subscriber base reached 156 million, representing a year over year increase of 4%.

Commenting on the results, Eng. Hatem Dowidar, CEO, Etisalat Group said, "Etisalat Group's first-quarter results are a continuation of the strong performance the company has achieved over the past year due

to the resilience and agility shown across our business operations. The company generated record results in the new hybrid scenario helping consumers adapt to a new work-and-learn-from-anywhere reality while continuing to deliver innovative services subscribers require and demand.

"Our teams rallied to support our customers with technology playing a central role in keeping our society, economy, and lives connected. Digital evolution is the future where telecom operators are the key players to enable the transition and be the exemplary adopters of digital transformation. Stemming from this conviction, Etisalat will continue its efforts to align its business with the digital mandate it has undertaken, by shifting the operating model, investing in future technologies, generating new revenue streams, and by acquiring and disseminating digital capabilities across its markets.

He expressed his gratitude to the wise leadership of UAE and their vision to position the country among the most digitally advanced globally and

inspiring Etisalat to deliver world-class networks and innovative services.

"We will continue to focus on capitalising opportunities and enhancing the overall customer experience while delivering long-term value for all our shareholders," he added.

During the first quarter, the Group initiated a slew of services such as collaborating with Smart Dubai to provide cyber security services to Dubai government entities, partnering with Cisco to simplify Emirates Internet Exchange (EMIX) operations by building the region's first open and autonomous and secured network as well as Digital Financial Services partnering with Al-Futtaim to enable secure and contactless payment options for eWallet customers, among many others.

In February, the Group's twelve month consolidated revenues had reached AED 51.7 billion, while consolidated net profit after Federal Royalty for the twelve month amounted to AED 9.0 billion (\$2.45 billion), an increase of 3.8% compared to 2019.

Zain to utilize 'Kuwait Mobile ID' app for digital identity verification



Zain, in collaboration with the Public Authority for Civil Information (PACI), is the first telecom operator in Kuwait to implement the use of the Kuwait Mobile ID app for digital and secure verification of identities. Zain's ongoing efforts to continue its active partnership with the public sector come in line with the company's comprehensive digital transformation journey. This announcement also comes under the umbrella of the Kuwait National

Development Plan (New Kuwait Vision 2035).

In detail, Zain has already completed all the technical requirements needed to integrate its back-end systems along with those of PACI. Thus, Kuwait Mobile ID users can now present the app via their smartphones when completing any official transactions that require identity verification at Zain branches.

Through the Kuwait Mobile ID app, the customer's certified digital civil ID will be accepted for verification, authorization, e-signatures, and other digital services. This digital approach can replace the use of the physical civil ID card, as it is

considered a legal identity that is issued and accredited by PACI.

The implementation of Kuwait Mobile ID is another step towards achieving full digitization at Zain's, reflecting the company's keenness on offering the latest and best digital services to its customers in the Kuwaiti market. The Public Authority for Civil Information offers the Kuwait Mobile ID app to present users with a secure, mobile-based, and certified digital ID that is capable of identity verification, authentication to online e-services, and applying a trusted digital signature to documents and transactions within government entities and private sector companies.

Etisalat, Nokia offer ultra-fast 5G in the UAE



Etisalat, one of the leading telecommunications operators in emerging markets recognized by Ookla® Speedtest® as the world's fastest mobile network in 2020, together with Nokia, as a key partner, has deployed 5G network, providing enhanced mobile broadband services and expanding 5G coverage and revenue opportunities. Nokia's 5G portfolio supports Etisalat's mission of driving the digital future to empower societies.

Etisalat has a proven history of bringing the latest in technology and broadband services to the United Arab Emirates to support economic growth and innovation. Similarly, Etisalat is building an autonomous 5G network using Etisalat A3 platform, where Nokia has worked with Etisalat to deliver best-in-class customer experience, as 5G's ultra-high bandwidth and low-latency enrich service offerings

and transform business models. 5G capabilities enable innovative applications in areas such as virtual reality (VR) and augmented reality (AR). It also addresses Industry 4.0 opportunities to benefit enterprises from various Internet of Things (IoT) use cases in areas such as energy, healthcare, education, transport and entertainment, providing new revenue opportunities.

Haitham Abdulrazzak, chief technology officer, Etisalat said, "As a true pioneer, we have always embraced the latest technologies to drive the Digital Future to empower society. Accordingly, we are building an autonomous 5G network and are very excited about how 5G can transform industrial and consumer services. The 5G services we have rolled out truly enhances lifestyles and delivers significant gains in productivity in the UAE, contributing to the national innovation strategy."

Saeed Al Zarouni, SVP, Mobile Network, Etisalat, added, "Etisalat's technical teams have closely worked with Nokia to build the 5G network smoothly and enabled 5G coverage with ultra-high speed and low latency services in the UAE. The high capacity 5G network also allows us to provide services to a large number of customers. Rolling out 5G network is in line with our focus on digital innovation and investments in next generation telecom technologies."

Tommi Uitto, President of Mobile Networks at Nokia, said, "With this deployment, Nokia is supporting Etisalat achieve its vision of driving the digital future. Along with consumers' expectation to get the latest telecom services experience, the current period has also shone a spotlight on just how important networks are for people and businesses. With this next generation 5G network deployment, we are excited to continue our longstanding collaboration with Etisalat to deliver the full transformational benefits of 5G."

Nokia has deployed its AirScale radio platform, based on 3GPP 5G New Radio (NR) standards. The network uses massive Multiple Input Multiple Output (mMIMO) radio technology to improve network capacity, provide broader coverage and increase network speeds.

Vodafone Qatar achieves highest quarterly net profit



Vodafone Qatar announced its financial results in Q1 2021 which unveiled the company's highest quarterly net profit of QR 66 million, after recording a 38% year-on-year growth.

Maintaining its growth trajectory within the first quarter, Vodafone Qatar's total revenue significantly increased by 8.3%, reaching QR 585 million. This is driven by continued growth in the company's postpaid revenue and fixed broadband services in addition to higher handset sales.

Moreover, its service revenue grew by 5.1% to reach QR 534 million.

Earnings before interest, taxes, depreciation, and amortization (EBITDA) for the period also increased by 17% year-on-year achieving QR 234 million. This is led by the company's higher service revenue and the continued effectiveness in implementing the cost optimization program. Consequently, the EBITDA margin rose by 3 percentage points to 40%.

Vodafone Qatar provides a comprehensive range of services including voice, messaging, data, fixed communications, IoT, and ICT managed services to more than 1.7 million customers.

Omantel introduces first 5G international roaming in Oman



Omantel has become the only mobile network operator in Oman to offer 5G international roaming with the introduction of its services, offering customers a convenient and seamless experience to enjoy high speed data services while abroad.

As part of the initial phase in its push towards secure, consistent, and fast global 5G connectivity, Omantel has made this international roaming facility available in the GCC through regional and global partners to announce more 5G international roaming destinations in the coming few weeks.

The move highlights Omantel's customer-first strategy and leadership of the telecom sector in the Sultanate,

providing cutting edge ICT solutions and telecom infrastructure and service capabilities.

Omantel expects to continually meet their subscribers' current and future 5G needs by making the technology an integral part of its offerings.

Commenting on the development, Awatif Al Mandhari, manager of roaming services at the wholesale business unit of Omantel said, "When we talk about 5G, Omantel is on the fast track. The company has proved its agility in bringing the best global telecom solutions to the people of Oman. After being the first mobile network provider to launch 5G for mobile devices, Omantel is now taking its reach beyond the borders. The service will be beneficial for individuals and business travellers who need fast access to information and data on the go."

The 5G international roaming service introduction enforces Omantel's

position as a key player in Oman's telecom sector as a result of foresight and investments in state-of-the-art infrastructure. The launch is the latest in a series of achievements by Omantel in adapting future technologies and further solidifying Oman's image as the region's ICT gateway. Besides 5G, Omantel is already offering an impressively wide international roaming coverage, reaching to more than 700 roaming partners in more than 200 countries.

Omantel's mobile network has been recently rated as the fastest in Oman by Ookla, a neutral online platform dedicated to measuring the performance of broadband networks around the world.

Omantel is the Sultanate's first and leading integrated telecommunications services provider, enabling the digital society to flourish, allowing new ways of doing business and delivering a world of information, news and entertainment.

Ooredoo Group's Q1 2021 financial results show resilience, solidity



Ooredoo announced its financial results for the first quarter of 2021, showing solidity and resilience despite the pandemic. Excluding foreign exchange (FX) impact, the revenue increased by 1%, EBITDA increased by 9%, and the net profit increased by 120%.

As a result of the company's quarterly analysis, the consolidated revenue reaches QAR 7.2 billion in Q1 2021. Despite the COVID-19 pandemic, excluding FX impact, the revenue increased by 1% and is mainly driven by growth in Qatar and Indonesia.

Moreover, the earnings before interest, taxes, depreciation, and amortization (EBITDA) increased by 9% (excluding FX impact) to QAR 3.2 billion in Q1 2021 as the company maintains its focus on digitalization and cost optimization. In comparison, the EBITDA margin increased to 45% in Q1 2021 from 41% in Q1 2020, supported by EBITDA margin expansion in Indonesia, Kuwait, Iraq, and Myanmar.

On the other hand, Ooredoo's net Profit attributable to Ooredoo shareholders increased by 120% (excluding the FX impact) to QAR 193 million in Q1 2021. Overall, data revenues account for more than 55% of total revenue driven by data leadership and digital transformation initiatives across the Group's operations.

Ooredoo Qatar saw positive growth during the period, with reported revenue growing 0.6% year-on-year to QAR 1.8

billion while EBITDA stood at QAR 962 million. Accordingly, the EBITDA margin remained stable at 54% and total customer numbers were 3 million.

Ooredoo Oman's performance was affected by economic conditions, increasing competition in the prepaid segment, and the COVID-19 impact. Its revenue sits at QAR 610 million in Q1 2021, with an EBITDA of 12% to QAR 314 million. Nevertheless, the company remains committed to managing its overall cost structure. Its customer base increased by 2% of 2.9 million in Q1 2021 as the company prepares to launch 5G mobile services in Q2 2021.

For Ooredoo Kuwait's performance, the company's revenue is QAR 607 million in Q1 2021, recording a 2% increase in EBITDA to QAR 169 million. Compared to the same period in the previous year, the EBITDA margin surged to 28% in Q1 2021 from 25%.



Heiko Perkuhn,
Managing Consultant at Detecon
International GmbH

How telcos will succeed with 5G campus networks

If telcos develop and market campus networks as products, they will fail. If they sell them as solutions, they will succeed. Does this sound a bit simple?

Probably. And yet the success of marketing campus networks depends on telcos approaching from the right angle when addressing their clientele.

5G campus networks are the subject of conversation everywhere, especially now that spectrum has become available for industrial use in several countries. The technology offers real potential for new use cases and cost savings for established ones. The clientele that wants to mine this potential, however, must be approached from the right angle. If telcos understand the motivation of their potential new customers while simultaneously finding a way to reap the benefits from the value-added chain themselves, the 5G campus business will become a strong pillar with long-term commitment that complements the ongoing transformation towards services and private communications.

5G opens the door to new opportunities on the global connectivity market

5G offers many new opportunities for revenues, and campus networks are among them. But it cannot be taken for granted that the established telecommunications providers will succeed as a matter of course.

The natural inclination might easily be to assume that a company whose

core business is the deployment and operation of mobile networks would have few problems in setting up networks for specific customers on the latter's own premises. But a closer look reveals that the challenges lie hidden in the details:

- On-premises core networks must be scaled down significantly
- Who owns the hardware – the provider or the customer?
- What SLA aspects are most important: MTTR, MTBF, mean availability?
- How can many small RAN and core networks be operated efficiently? How can the need for field service be minimized?
- How should SIM cards be managed?
- How should the campus network be integrated into the customer's current IT environment?
- How should services be provided on the site, and how should the service partner be managed?

Campus networks are a customer-specific business

Some of these aspects are covered by suppliers offering dedicated, packaged solutions for campus networks comprising scaled-down and less complex core network equipment and the appropriate RAN solutions.

But telcos must not fall into the trap of regarding private cellular networks as a smaller version of the mobile network they are used to building and operating.



When telcos play to their strengths, they have a competitive advantage that puts them in a position for success



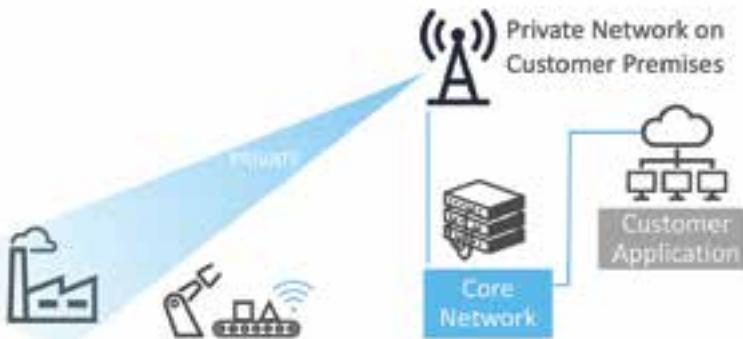


Figure 1: Illustration of a Private Cellular Network.



Value-added chain with four phases for setting up and operating campus networks

Since private networks lack some of the assets a telco can typically expect to have in traditional business, exploiting the existing value-added chain is more of a challenge. The customer may have acquired the spectrum and own the equipment, and there are no SIM card subscriptions for the use of the public network. This leaves services as the source of the revenue stream. The process of setting up and running campus networks can be broken down into various phases, and value is created in each of them:

- Consulting + Pre-Sales
- Deployment Planning
- Deployment
- Operations

Market approach: Value proposition and personae

Private cellular networks have been a niche business for quite a while, e.g., providing mines, harbors, oil rigs, etc., with wireless communications infrastructure. Such networks have been set up and operated by specialist companies (among them, Edzcom, Syniverse, Infrastructure Networks). With the advent of 5G and the need for telco operators to find new revenue streams to pay for their investments, this business has found its place on the agenda of telcos as well. The most promising approach to acquiring 5G campus business with typical industry customers is to begin by attracting

their attention with an enticing value proposition: a network under their own control that can be set up rapidly, is not too complex, does not require huge investments up front, and provides valuable insights on propelling their production into an Industry 4.0 world.

Detecon, in collaboration with Deutsche Telekom, has analyzed the customer landscape and by drawing on interview results, has identified six segments that can be portrayed as "personae": The Inquisitives, the Testers, the Corporate Network Strategists, the Business Strategists, the Project Planners, and the Professionals.

These "personae" should not be seen simply as "segments"; rather, they represent a dynamic mapping that may change over time as markets mature. The same customer can evolve from one persona into another. Private cellular networks with no connection to the public mobile network of a network provider are most interesting for the "Business Strategists" and the "Corporate Network Strategists"; the former because they are looking to support a road map of future use cases, the latter because they have a concrete use case in mind. Alternatives for this type of customer would be Wi-Fi networks. In Germany, for example, SMEs represent the biggest group of potential future users of 5G campus networks from a telco point of view.

The challenges for the provider are manifold:

- Clearly point out the technological advantages of 5G
- Offer a competitive price. Even if cost savings in the long run are a good argument, the upfront price must nevertheless be appealing
- Achieve a short deployment lead time
- Offer competitive cost of operation
- Convincingly demonstrate how a telco's USP is an advantage over what other providers can offer
- Have a competitive edge to set itself apart from other telcos – be it edge cloud partnerships, collaboration with application providers (in the AR/VR field, for instance), or a convincing promise of the best service from the local presence of field technicians at any site

A good strategy, although it is a challenging one, is to develop a modular structure of the offer – start with a small, simple offering that can be scaled up according to demand.

Operational approach to campus network operations: How much "rollout" is possible?

There are apparently two schools of thought when it comes to the operation of campus networks.

1. The assumption is that the wireless site on a customer's premises is simply another site in the operator's

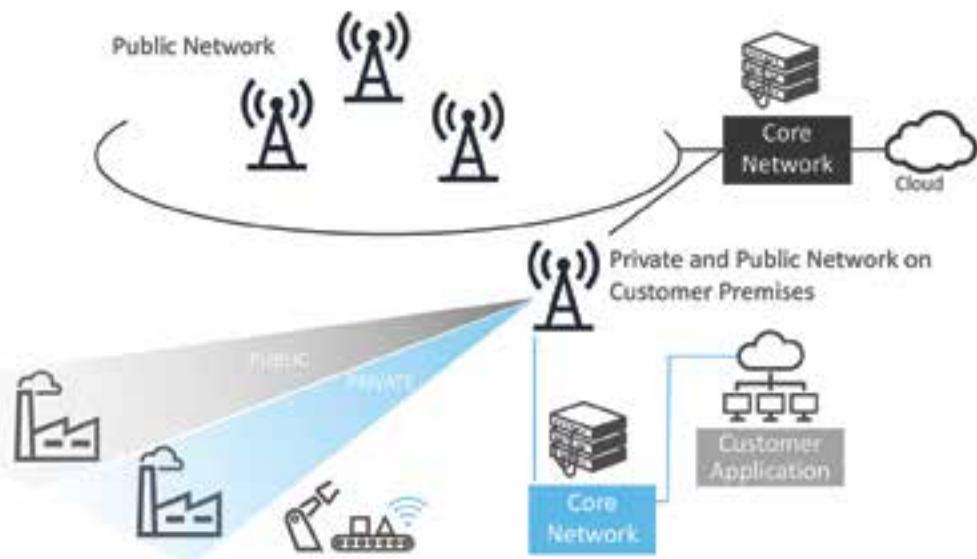


Figure 2: Private Network Integrated with Operators Public Network



LIFE IS FOR SHARING.

network and requires the use of exactly the same kind of equipment found in the rest of the wireless network. The connectivity to the OMC is set up as with any other site. The processes are the same ones used for any wireless network rollout. A core network on the customer's premises, however, must be handled differently. The addition of 50 to 100 very small core sites cannot be monitored and maintained in the same way as the existing core sites. Specifically, on-premises maintenance is not possible with the same staff.

2. Every campus network is regarded as a unique, isolated network. This view corresponds to the treatment of LAN/Wi-Fi enterprise networks. Operation and maintenance can nevertheless be centralized, but require a set of processes and tools that differs from those for the public network. There is more freedom in

choosing the wireless equipment as it does not have to match the equipment in the public network.

The second approach is more feasible for the current, immature market phase in particular, characterized as it is by many customers who want to test and explore the technology and are not absolutely sure if and how they will use it. The term "rollout" will probably never be completely appropriate for this kind of business as it will always be more solution than product.

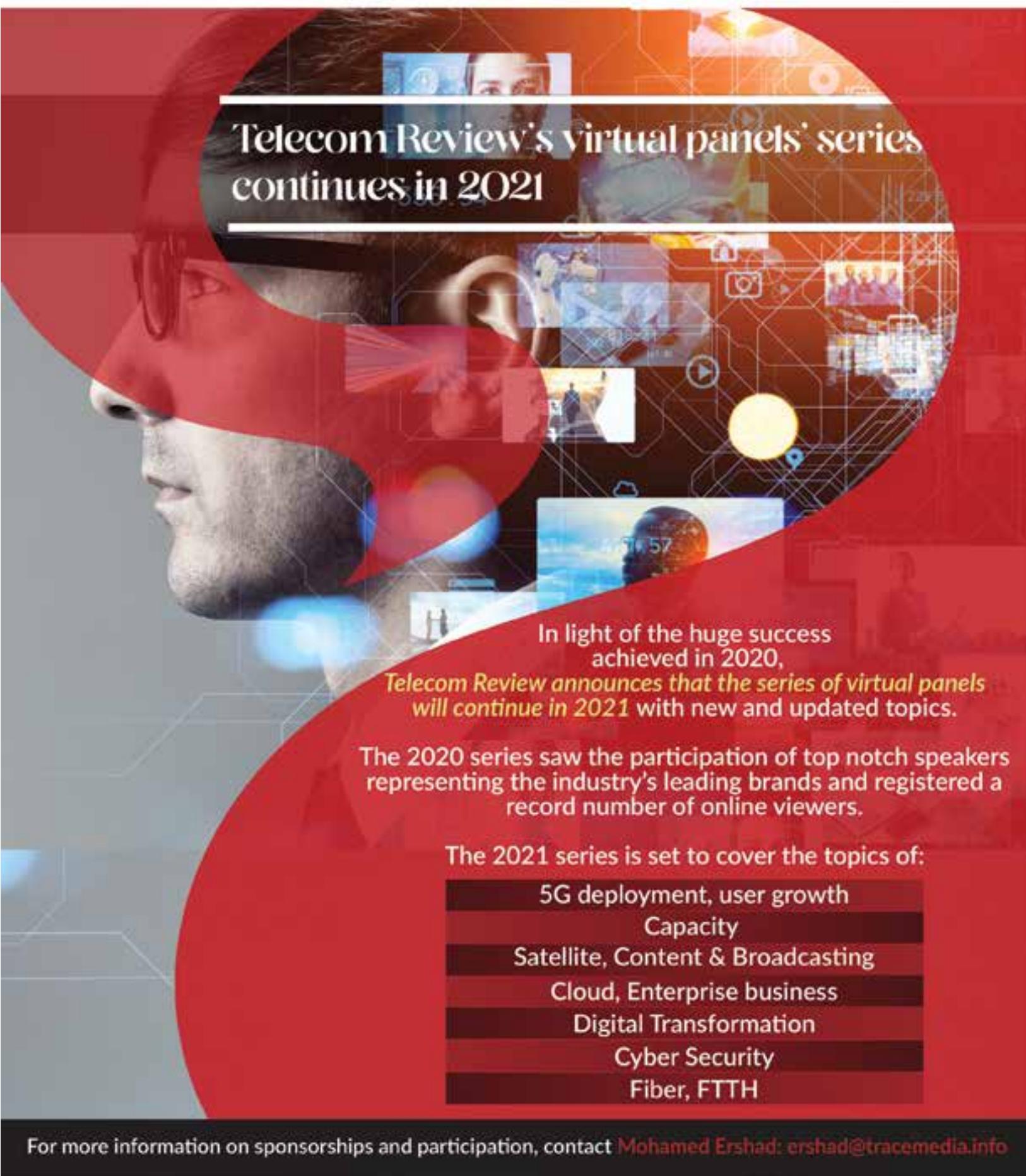
Our conclusion: Campus networks are a solution business, not a mass product

When telcos play to their strengths, they have a competitive advantage that puts them in a position for success. They own spectrum that can be added to any spectrum dedicated to the industry, a clear benefit they can

offer. Industry customers want private networks because of their sense of being in control. Another valuable asset of telcos is their undisputed experience in planning, deploying, and operating networks. However, they must also do some homework. The market is young, evolving, and dynamic; telcos should quickly determine their most promising customer segment and focus marketing resources on this group. Internally, this business should be anchored at the appropriate points in the organization, from sales and product development to planning and operations. Most importantly, campus networks must be regarded as a solution business, not a mass product. ■

By Heiko Perkuhn, Managing Consultant at Detecon International GmbH, with contributions by Managing Consultants Dr. Britta Cornelius and Dr. Daniela Drube

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

Moro Hub, Huawei to build the largest solar-powered data center in MEA



Moro Hub, a subsidiary of Digital DEWA, has signed an agreement with Huawei to build the largest solar-powered data center in the Middle East and Africa (MEA) at the Mohammed bin Rashid Al Maktoum Solar Park.

The new Uptime TIER III-certified, sustainable, and carbon-neutral green data center will use 100 percent renewable energy and has a capacity exceeding 100 megawatts (MW).

Marwan Bin Haidar, vice chairman and GCEO of Digital DEWA and Mr. Jerry Liu, CEO of Huawei UAE signed the deal, with HE Saeed Mohammed

Al Tayer, MD & CEO of DEWA, and Mr. Charles Yang, President of Huawei Middle East as witnesses.

"The sustainable data center supports Dubai's 10X initiative launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, to make the Emirate a city of the future, putting it 10 years ahead of other global cities. This meets our ambition to deliver sustainable digital transformation and anticipate and shape the future. This supports the UAE Centennial 2071 to make the UAE the world's leading nation and the 17 United Nations Sustainable Development Goals 2030. The carbon-neutral center supports Dubai's efforts to exceed the goals of Dubai's Carbon Abatement Strategy in reducing carbon emissions by 16% by 2021. Dubai has surpassed this target, reducing emissions by 22% in 2019," said Al Tayer.

Moreover, the center will offer digital products and services using the cloud, the Internet of Things (IoT), and artificial intelligence (AI) — all of which are vital technologies in the Fourth Industrial Revolution. Aiming to be the largest green data center in the MEA region, it will enable global hyperscalers to access carbon-free computing.

"We are pleased to associate with Moro Hub as the key technology provider for the largest green data center in the region. This is an important association, and it allows us to strengthen our partnership with Moro Hub and take part in fortifying the UAE's sustainable development goals. There's been significant growth in the renewable sector, and we are optimistic that this agreement will reinforce our endeavors to implement and strengthen the adoption of carbon-neutral digital technologies," said Yang.

Tata Communications, BIX bring superior submarine cable system to Bahrain



Tata Communications and Bahrain Internet Exchange (BIX) extend their partnership to offer high-speed internet connectivity with very low latency for superior quality and seamless viewing, gaming, and download experience for customers in Bahrain. This collaboration brings the power of high-speed connectivity and digital transformation to the Middle East region through the TGN-Gulf cable system, enabling customers to have a robust, consistent, and manageable data transport infrastructure capable of scaling up beyond 100 Gbps.

Furthermore, to extend the TGN-Gulf cable system deep into business

districts within the Middle East, Tata Communications is leveraging its strong partnership with leading carriers across the region such as Oman, UAE, Qatar, Bahrain, and Saudi Arabia, to offer a true carrier-neutral comprehensive cable system.

This will provide Middle East businesses, especially the OTTs, gaming companies, government agencies, and hyperscalers who are expanding their reach in the region, access to the globe. The cable system seamlessly integrates the Middle East countries and offers direct forward connectivity to Europe, India, and onwards to the globe. Specifically in India, it integrates into the deeply penetrated Optical Transport Network that covers 2000+ towns and 25+ business districts.

For enterprises, the superior OTU-4 technology on the TGN cable system provides flexibility to future-proof and

create a software-defined network (SDN), while still being compatible with legacy systems. It also helps enterprises adopt edge computing and make use of cloud express connect, to link to different cloud nodes in and out of Bahrain. Furthermore, it will also enhance the performance and stability of the enterprises' data, voice, and video applications at shorter round-trip delays (RTD). With reliable connectivity and bandwidth, enterprises will accelerate their digital transformation journeys making for the country's ecosystem to evolve towards a digital economy.

Tata Communications owns and operates the world's only wholly-owned subsea network that encircles the globe. This network enables businesses to reach more than 200 countries and territories. Today, around 30% of the world's Internet routes travel over the Tata Communications network.

PCCW Global launches globally-connected eSIM service



PCCW Global, a leading telecommunications service provider, has launched a globally-connected Embedded-SIM (eSIM) service that is immediately ready for Internet of Things (IoT) deployment globally, providing ground-breaking device connectivity that is expected to revolutionise the automobile, logistics, and connected equipment manufacturing industries.

Making use of technology from Thales, PCCW Global's eSIM is a secure, GSMA compliant device that has been designed to remotely manage multiple mobile network operator subscriptions. The support for multiple profiles enables the use of a single SIM with multiple providers' profiles. Connectivity for the new eSIM service is provided across PCCW Global's

Tier 1 international and partner network covering 180 countries and territories. In addition, PCCW Global makes use of a proven and reliable technology platform with full integration through a single connectivity and SIM management portal, automated on-demand connections to cloud capabilities with Console Connect IoT integration and full support across PCCW Global's IoT service ecosystem.

Universally acknowledged as the next great leap forward in communication technologies, IoT is transforming everyday items into connected devices. It provides unprecedented connectivity and the exchange of 'always-on' information 24x7, unleashing seemingly limitless opportunities for consumer and commercial applications.

From vehicles with the ability to transmit information back to a fleet owner or a manufacturer, wearable wrist alert bands capable of communicating vital health information for those with medical conditions, to vending machines able to order their own replacement stock, IoT is poised to connect just about everything.

Due to its small size and other significant technological benefits, eSIM is a critically important development for the widespread deployment of IoT devices. The PCCW Global eSIM is available in various form factors and can be installed in any compliant device.

eSIM technology is expected to have a wide-ranging impact on a diverse number of industries. From logistics, through to smart homes and smart cities – everything can be connected with small eSIM technology that requires reduced power for longer uptime between charging.

Craig Price, senior vice president, mobility products and marketing, PCCW Global, said, "We are excited about the possibilities that our new eSIM features and connectivity will provide for many industries. Now we have the technology, the automated platform, and the global connectivity to truly make IoT a reality, enabling business to leverage all of the advantages connected devices bring to a globally connected world."

Corning reports strong first quarter results

CORNING

Corning Incorporated announced results for the first quarter ended March 31, 2021.

Corning reported a strong first quarter with GAAP and core sales amounting to \$3.3 billion, year-over-year increases of 38% and 29%,

respectively. GAAP EPS was \$0.67, reflecting strong performance and a non-cash, mark-to-market gain associated with the company's currency-hedging contracts. Core EPS grew 125% year over year to \$0.45

All segments grew sales and net income by double-digit percentages year over year:

- Environmental Technologies grew sales 38% and net income 111%
- Specialty Materials grew sales 28%

and net income 78%

- Optical Communications grew sales 18% and net income 283%
- Life Sciences grew sales 16% and net income 26%
- Display Technologies grew sales 15% and net income 40%

Free cash flow of \$372 million grew \$691 million year over year and equates to 39% of 2020 total. Profitability was impacted by approximately \$50 million due to elevated freight and logistic costs and global supply chain disruptions.



It's all about the chips: Opportunities in times of crisis

The unexpected shortage in semiconductor microchips has witnessed increasing cases of stunted or late car production and deliveries, a shortfall in home appliances, and costlier smartphones across the globe.

Competition of other use cases of the chips against the demands of the expansive consumer electronics industry has been quite rough in recent months.

Several causes resulted in the chip scarcity – the demands from the consumer electronics industry during the pandemic as people worked from home and engaged in gaming and streaming activities and the US

sanctions against Chinese technology companies added to the semiconductor shortage woes. Additionally, Taiwan, the world's biggest supplier of computer chips, mostly made by the Taiwan Semiconductor Manufacturing Company (TSMC) had to endure the brunt of major drought conditions. Since the production of chips requires heavy use of water, the reservoirs dried up and thereby disrupted the production process.

Consequently, the surge in demand has thrown major challenges to the supply

aspect of the chips. According to the Semiconductor Industry Association (SIA), chip sales in January 2021 hit \$40 billion, which is up 13.2 percent on the same month last year.

The recent goings in the semiconductor market have triggered a re-think on the reliance on foreign-built chips since they have become a key component in cars, smartphones, home appliances, and other electronic equipment for use in sensors to control units. Processors and semiconductor technologies are

key to connected devices and data processing.

Owing to the shortage, the Chinese government has adopted the policy to boost the domestic semiconductor sector as demand for chips grows. This trend has become a global one, with major US companies including Google, Amazon, and Facebook investing in their chip-making efforts. Chinese internet giants, automakers, and even home appliance firms are investing heavily in semiconductor research and development.

In the US, the semiconductor industry is requesting president Joe Biden's administration and Congress to fund semiconductor incentives included in last year's National Defense Authorization Act.

Chip shortages have cost the global auto industry 130,000 vehicles in lost production, research firm AutoForecast Solutions estimates, with the heaviest impact in North America, with 74,000 units lost, and Western Europe, with 35,000 lost.

The scarcity of chips initially hit the auto industry, however, it has now come to affect all types of chips ranging from hardware products, including smartphones. This has led the Chinese smartphone maker Xiaomi Corp president Wang Xiang to say that the global chip shortage was adding to the company's production costs and the higher prices of its products might affect the consumers. Qualcomm Inc, a key supplier to Xiaomi, is struggling to meet orders for major smartphone brands.

What is hindering chip production?

Typical semiconductor factories have limited capacity and building new factories takes massive investment and often several years. They have to be built in factories with ultra-controlled environments, called 'fabs.' Dust particles, temperature fluctuations and even static electricity can damage the complex workings of semiconductors. According to analysts, currently, fabs are running at full capacity and will take months or years before new ones come online to fill the extra demand.

Shortage in chip production highlights demand for ICT devices

The higher profit margins from the production of smartphone and tablet chips are much more alluring to chip-makers than from older technology used in cars. As a result, Taiwan's tech firms saw revenue growth from demand for chips for laptops, tablets, smartphones, and other products to support the work and study at home around the world during the COVID-19 pandemic.

TSMC has announced plans to spend \$28 billion on increasing chip production capacity in 2021. Last year, the Chinese government invested \$22 billion into domestic chip production and it is likely to double the budget in 2021. Likewise, the US government seems to have realized the importance of the semiconductor industry to national security and a thriving economy as almost all IC chips used in the US are made abroad.

The shortage in chip production can be attributed to the unprecedented demand in tech devices and services for organization and individuals alike. In such a scenario, the role of ICT sector in providing integrated network and connectivity solutions is only going to grow. Additionally, the adoption of 5G technology and migration to the cloud will accelerate the use cases for hyper-connected rooms and other multi-dwelling units (MDU) owners and operators to deliver multiple 4K video streams, IPTV, virtual reality, VoIP, and ultra-fast downloads.

A recent report by Gartner forecasts that the highest growth in IT spending will come from the device segment (14 percent) followed by the enterprise software (10.8%) as organisations transition into a digitalized work environment.

By taking a hint from the current state of the semiconductor demand and supply, ICT stakeholders would do well to facilitate knowledge discussion, brainstorm innovative ideas through proofs-of-concept and pilot projects and prepare the tools

and know-how to build and scale sustainable business models.

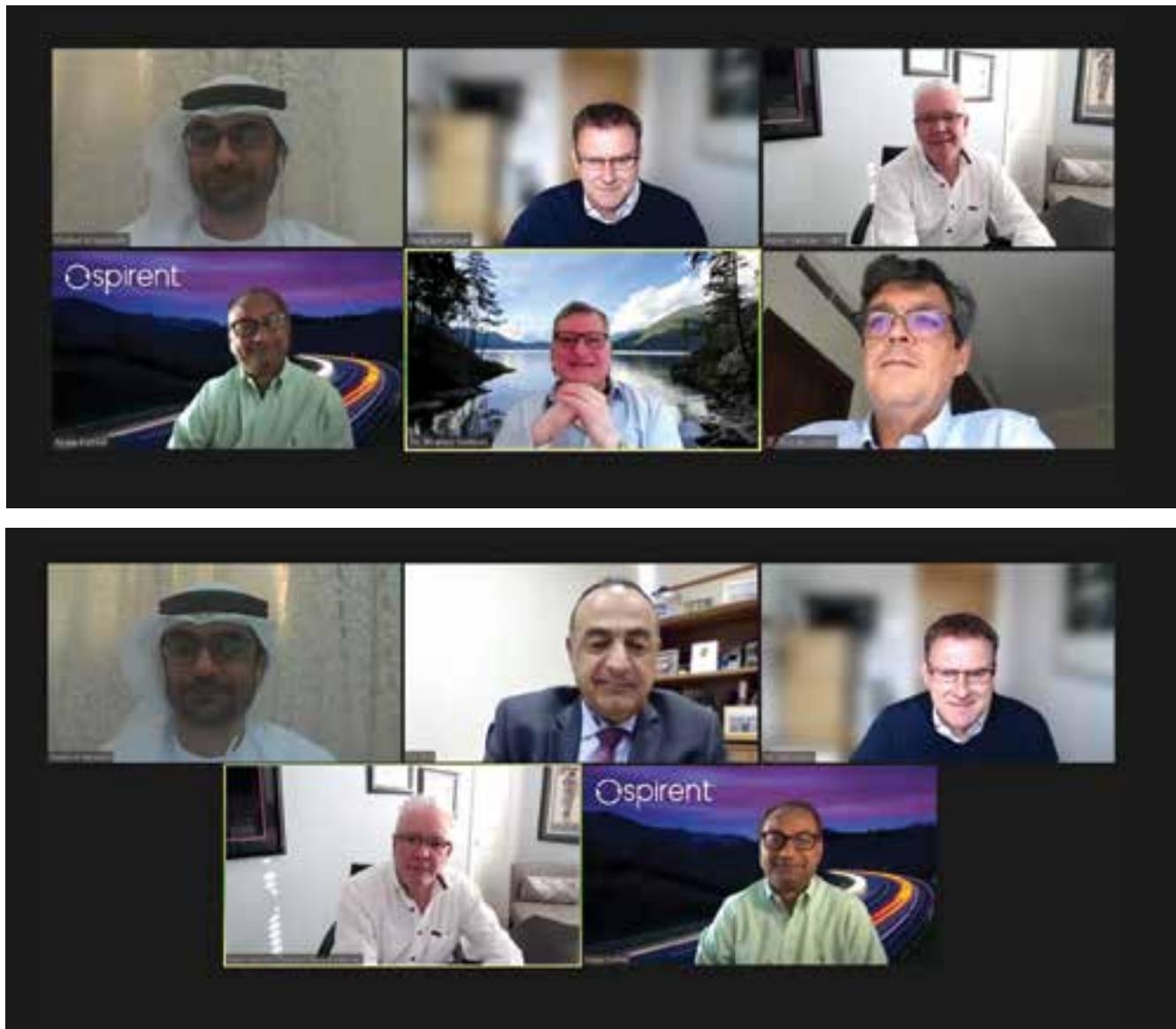
Given the current scenario of economic recoveries after the pandemic, organizations and businesses will require a mix of remote and hybrid employee arrangements in smarter offices, warehouses, and factories with continued demand for flexible digital infrastructure – networks and applications that can serve workers regardless of where they may be located. More than 80% of company leaders plan to have employees continue working remotely, with almost half planning to have some employees work remotely full time.

Enabling organizations to implement a unified network infrastructure that supports both end-user and operational needs are areas that warrant the consideration of ICT players in all categories. **TR**



The scarcity of chips initially hit the auto industry, however, it has now come to affect all types of chips ranging from hardware products, including smartphones





Network automation and SD-WAN discussed at Telecom Review virtual panel

Telecom Review organized a virtual panel on April 27, 2021, where a panel of industry experts discussed the topic of Network automation & SD-WAN in the era of virtualization.



etisalat **NOKIA** **Osprent** **PCCW Global**

Network automation & SD-WAN in the era of virtualization

Date: Tuesday 27 April 2021
Time: 4:00 PM Dubai time

The esteemed panelists included:

- Mr. Roque Lozano, SVP IP & optical networks, MEA, Nokia
- Mr. Aloke Tusnial, vice president, cloud business & solutions, Spirent
- Mr. Khaled Al Belooshi, VP fixed networks, Etisalat
- Mr. Neil Templeton, vice president, digital innovation marketing, PCCW Global
- Dr. Ibrahim Gedeon, CTO, TELUS

The panel discussion was moderated by Mr. Kevin Vachon, chief operating officer, MEF.

Following a brief welcome and thank you note by Mr. Toni Eid, founder, and CEO of Telecom Review, Kevin Vachon started the session by referring to a conversation that he had had with Roque Lozano earlier, where the latter had mentioned 'automation as the forest and SD-WAN as one of the trees' to illustrate the concept of the topic.

After a brief introduction by the panelists, the discussion moved towards first understanding the nuances of automation and gradually moving towards SD-WAN.

Considering that automation is a broad topic and a rather long haul when it comes to its implementation, the first

question put to the panelists was 'what are the major drivers for automation?'

Taking on the question, Khaled Al Belooshi felt that automation has become critical for operators. He said that it's not optional anymore and instead has become more of a transformation process. "Automation along with network virtualization can bring clear value to the operators. It touches all stakeholders, whether it's from HR, technology, and commercial, and needs to be handled with a clear strategy and standards for APIs and domains as a complete strategy," he explained.

"When it comes to the drivers, I think there are two main drivers for automation -- it's the digital experience that we want to bring to operators and the operational efficiency. Agility, a faster time, and rapid deployment are the things that we are looking for," he said.

He also stressed the need to look at the new requirements for future networks such as mass customization of real-time and on-demand services from customers. "When it comes to operational efficiency, self-healing, self-optimization are areas we want to focus on with automation. Together with AI, we can actively address issues in the network before it causes outage problems," he added. He also pointed out that the future network was going

to be very complex with virtualization, network slicing, etc., and automation should play an important role in reducing this complexity.

Joining the conversation, Neil Templeton said that the automation journey at the service layer and application layer is only made possible by automation at the network layer. "The whole shift to the multi-cloud environment for business-critical applications, outside of traditional network parameter, needs flexible and agile network infrastructure." He explained that for PCCW Global, the main driver for automation is the removal of complexity, taking out the friction and the cost. "You've got to automate as a necessity," he added.

Adding flavor to the discussion with the security element to automation, Aloke Tusnial contributed by agreeing that automation was important from the self-healing perspective and removing complexity. But he said that the networks are getting complex by the day and by building configurations to remove complexity, the question of ensuring how the configurations work is critical.

"If something goes wrong, how do you troubleshoot?" he inquired. He also pointed out that networks are getting distributed and the multi-cloud environment is transitioning to multi-edge. "Earlier networks were

centralized but now we are moving toward decentralization of network and security, which has become a big challenge," he said. Touching on SD-WAN, he said the technology can add security at the edge as enterprises and customers are used to a certain level of security, and providing that same level of security should be the focus.

Dr. Ibrahim Gedeon reiterated that with the advancement of new technologies such as SD-WAN and other modernizations, customers expect frictionless automation. "People want to manage their own devices. Without automation, we won't be able to compete with the expectations," he stressed.

To wrap up the conversation over drivers of automation, Roque Lozano said that the cost and security were important when it comes to automation, but he felt the most important aspect was the business impact in 'real-time.'

"The capability of doing more things, capability to rearrange network service in real-time are the key drivers as most operators know that new generation of services requires multi-services capabilities in the network," he explained.

Another important point, he said was that we are not automating the network, we are automating the service to ensure that the whole value chain is automated. "The network for sure is the enabler, but the automation is not only regarding software and hardware that we install, automation covers the whole service proposition for the carriers and the enterprise," he pointed out.

Touching upon the topic of SD-WAN, he said the technology will enable multi-application services. "SD-WAN is a particular application of technology that facilitates several use cases that are getting more traction in a couple of years," he opined.

End-user (customer) agility involves understanding and predicting the customer needs, solving their problems, and putting customers in

control. With SD-WAN and automation, the desire of end-users to be self-provisioning emerge.

Neil Templeton, vice president of digital innovation marketing at PCCW Global, said, "It's becoming an environment for automating not just at the network layer, but the application layer, and we're also working on the settlement layer as well, which is a vast ecosystem of service providers." Neil cited how they transformed from a network provider into an open platform business through ConsoleConnect.

Customers basically want to find, get and pay for the services they want, when they want them. In line with this, Roque Lozano, SVP IP & optical networks, MEA, Nokia, said, "The user experience is wide. If you don't match it, they will never trust any type of new services. I think SD-WAN is a good feat for the users and enterprise segment that combine, as I said, the agility and independence of the user to define their own network and the security of the carrier-class."

In terms of ensuring the same QoS throughout the ecosystem as more people go towards the cloud, collaboration and innovation can be done. Aloke Tusnial, vice president of cloud business and solutions at Spirent said, "I think with the payload-independent APIs ... if we put the right amount of SLAs on there, if we put in the right amount of testing out there, we make sure that we actually look at it at an end-to-end perspective, hopefully very soon, we'll get an environment where maybe PCCW Global is providing the interconnectivity, TELUS is on one side of the antenna and Etisalat is on the other side, and you can actually provide a full SLA-based SD-WAN connectivity, all the way from Canada to UAE."

Khaled Al Belooshi, VP fixed networks, Etisalat, explained that as part of their SD-WAN initiatives, zero-touch deployment and end-to-end service orchestration are offered to end-users. On the other hand, Kevin Vachon, MEF chief operating officer, mentioned that the scope of orchestration has grown, but the automation process is slower

for everybody. Reasons such as lack of IT resources, ambitious business case, and awaiting for OSS/BSS upgrade deprive the adoption.

Sharing how TELUS started its SD-WAN journey in 2016, Dr. Ibrahim Gedeon, CTO, TELUS, said, "The motivation for us is to mix and match network connections; this is the business case. Being able to go cable, DSL, or fiber and kind of redefining how business connectivity is doing. And then we added all the new software stacks in the BSS and OSS to get that automation."

Both TELUS and PCCW Global noted that SD-WAN requires them to collaborate their teams together, particularly within a distributed environment which is the cloud. Aloke raises the question about determining security policies that can propagate the same QoS across everyone.

He clarified that "As you move more and more stuff into the edge, you are getting more decentralized; which means security becomes a big challenge. You can't put security in one point. You are not VPN-ing everything to one secure place and ensuring that the traffic that goes between them is all secure." This is the reason why the secure access service edge (SASE) is also a driver for SD-WAN.

Dr. Ibrahim also noted that CPEs are still needed despite the transition towards the cloud. In response, Aloke highlighted the benefit of the cloud in delivering CPEs. "Thanks to the partnership we have with MEF on the certification space, we see more and more of that is SD-WAN providers are now trying to get CPEs that will work on the edge cloud. So instead of trying to ship the CPEs to a customer's premise, you basically put it on the edge and then you have a software agent that's running on the edge so you don't have to deliver a CPE to everyone."

In a nutshell, the SD-WAN industry is now moving into a cadence. Despite networks becoming more complex, QoS can be achieved. "If we all work together, that day is not very far. We can actually achieve that," concluded Aloke. **TR**

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Huawei proposes new '5G Experience Benchmark' for ME



Aiming to provide a comprehensive evaluation of 5G services for users across the Middle East, Huawei has proposed a new '5G Experience Benchmark.' The significance of this benchmark complements the rapid commercialization of 5G technology across the region. The benchmark aims to enable telecom operators to focus on improving 5G user experiences, make precise investments, and improve ROI.

According to the experience of the world's 5G pioneer market, 5G users are mainly sensitive to the network rate, real-time experience, and 5G service availability. In the GCC, the insight

also shows that although 5G has been deployed on a large scale, there are many opportunities to enhance user experience with better speed and less latency, especially for gaming and video users. This requires the industry to build a unified benchmark to evaluate comprehensive 5G experiences, again enabling operators to focus on the user experience, make precise investments, and improve ROI.

Huawei proposed the 5G experience benchmark by an S.L.A. model, which considers factors including 5G spectrum bandwidth, download rate, E2E latency, and coverage, to comprehensively evaluate the 5G user experience. The 5G S.L.A user experience benchmark includes three main indexes, Speed, Latency, and Availability, and the overall index is calculated by $S \times L \times A$. S indicates the speed; L indicates latency and A indicates the availability of 5G network.

The score obtained by multiplying the three indexes is the final network experience benchmark value.

The 5G experience benchmark is a multi-dimensional comprehensive measurement model. For the

specific measurement method and detailed scoring mechanism, it is suggested that regulatory authorities and operators should discuss and cooperate to further clarify the quantification. For example, top services on an operator's network are different. Based on different services, entities need to perform modeling based on a large number of live network samples or lab test data.

Also, the baseline values corresponding to good user experiences, such as the rate and latency, are provided to help measure and score the network experience gap and identify the operator network construction direction. Huawei hopes that regulatory agencies and operators can reach a consensus on the availability of rate and latency, use these dimensions as the criteria for measuring their networks, and then perform detailed measurement and analysis based on their networks.

The analysis of their networks will allow operators to identify the experience problems and gaps to make precise investments to improve the user experience and accelerate digital economic growth.

Nokia settles patent cross-licensing deal with Lenovo



Nokia has announced that it has resolved a multi-year, multi-technology patent cross-license agreement with Lenovo. Under the agreement, whose terms remain confidential, Lenovo will make a net balancing payment to Nokia. The deal settles all pending patent litigation and other proceedings between the two parties, in all jurisdictions, according to their statement.

Commenting on the development, Jenni Lukander, president of Nokia

Technologies, said, "We are delighted to have reached an agreement with Lenovo. The agreement reflects Nokia's decades-long investments in R&D and contributions to cellular and multimedia standards. We appreciate, and very much respect, the constructive spirit Lenovo brought to our negotiations and look forward to working together to bring further innovation to their users around the world."

Meanwhile, John Mulgrew, chief intellectual property officer of Lenovo, said, "Our agreement with Nokia reflects the value of both Nokia's technology leadership and Lenovo's continued investment in 5G innovation. The global accord struck will enable future collaboration between our companies for the benefit of customers worldwide."

Nokia's patent portfolio is built on more than €129 billion invested in R&D over the past two decades and is composed of around 20,000 patent families, including over 3,500 patent families declared essential to 5G.

Nokia has also contributed significantly to multimedia and video research and the development of industry standards over the course of more than 30 years.

Nokia contributes these and other inventions to open standards in return for the right to license them on fair, reasonable and non-discriminatory (FRAND) terms. Companies can license and use these technologies without the need to make their own substantial investments in R&D.

Huawei to provide technological edge to Saudi's transport and logistics sector

The Saudi Ministry of Transport has chosen Huawei technologies to boost the adoption and utilization of technology in the field of transportation and logistics to enhance the services it provides and achieve the goals of Saudi Vision 2030 set by the kingdom.

Huawei, a global leader in ICT infrastructure and smart devices, has signed a Memorandum of Understanding (MoU) with the ministry to enhance future mobility and technology adoption by leveraging the potential of advanced technologies such as 5G, AI and Big Data.

The MoU was signed by deputy minister of Transport for Roads, Eng Badr Al-Dulami, and David Shi, president of enterprise business group, Huawei Middle East.

Under the arrangement, Huawei will provide solutions in the field of automation, big data, and digitization. It will also contribute to the provision of solutions for shared mobility, sustainability, and the use of disruptive technology in the development of the logistics sector and intelligent transport systems in the Kingdom.

Deputy Minister of Transport for Planning and Information Dr. Mansour Alturki represented the Ministry of Transport and David Tao, general manager of enterprise business Huawei Tech Investment Saudi Arabia, represented Huawei.

Alturki said that the agreement will contribute to enhancing the quality of life across the country through the adoption of advanced smart transport systems as well as improving the

services provided to citizens, residents and visitors across all transport facilities including airports and railway stations. It focuses on finding ways to implement the latest automation and IoT practices in our operations in addition to increasing multimodal integration to enhance transportation inside and across cities and reduce travel time.

Located strategically along international trade routes in Asia, Europe and Africa, Saudi Arabia's Vision 2030 aims to make the most of the benefits of its advantageous geographic position by building robust and well-functioning transport & logistics hub in the region.

KSA government has already invested heavily in the construction of several transport & logistics infrastructure such as ports, railways, roads and airports.

CommScope to spin-off its Home Networks business into independent public company



CommScope Holding Company, Inc., a global leader in connectivity solutions for communications networks, announced its plan to spin-off its Home Networks business and other initiatives to reduce operating costs throughout the Company.

Together, the planned separation of CommScope's Home Networks business and operating expense reduction represent early steps in the Company's CommScope NEXT strategy to optimize the business portfolio, drive above-market growth, and control costs. The separation is intended to be executed through a tax-free spin-off to CommScope shareholders to form a new and

independent publicly traded company. The separation is expected to be completed by the end of the first quarter of 2022.

The planned spin-off will allow CommScope and Home Networks to focus on innovation and pursue strategic market opportunities, accelerating growth and unlocking greater value for their customers.

Following the completion of the spin-off transaction, CommScope will be composed of the following three business segments:

- Broadband Networks: Dedicated to serving the telco and cable provider broadband market as a leading equipment manufacturer. The segment is focused on growing its current portfolio and deployment of DAA and virtualized platforms and driving investments to expand fiber capacity, fiber connectivity and network orchestration.

- Venue and Campus Networks: Targeting both public and private networks for campuses, venues, data centers, and buildings. Venue and Campus Networks is focused on driving performance in its RUCKUS Wi-Fi 6 and cloud control platforms, ONECELL features to capitalize on 5G growth and virtualization, and driving high-density expansion in data centers.

- Outdoor Wireless Networks: Focused on the Macro and Metro Cell businesses and building metro cell power solutions and modularity design innovation. The segment is also working on the development of new technologies in cell site connectivity and other technologies to support telco carriers building their 4G and 5G networks.

CommScope will continue to be led by Chuck Treadway, president and CEO, and its current management team.

Qualcomm reveals 5G mmWave connectivity 16 times faster than sub-6 GHz



Qualcomm Technologies, Inc. announced real-world test results demonstrating that 5G mmWave connectivity speeds on commercial devices is 16 times faster than 5G operating solely in sub-6 GHz frequencies. These results were based on Ookla® Speedtest Intelligence®

data* from user-initiated tests on commercial devices in the United States. 5G mmWave uses ultra-wide channels to deliver exponentially faster speeds and greater capacity compared with lower frequency 4G or 5G bands. 5G mmWave momentum continues through the world, with deployments from all major operators in the U.S. and Japan, recent deployments in Europe and South East Asia, and more coming soon in regions such as Australia and Latin America. China is also expected to deploy 5G mmWave for the Winter Olympics early next year.

5G mmWave is critical to dramatically improving the performance and advancing the variety of connected experiences in every setting. This advanced technology delivers massive bandwidth whether you're at home with 5G fixed wireless access, on-the-go in a train station streaming TV shows, at work or school with a need

for enterprise-grade connectivity, or in heavily crowded venues and similar public settings.

Qualcomm Technologies made 5G mmWave technology a reality and it is building breakthrough technologies and products to ensure its availability to users. Qualcomm Technologies, along with leaders in the mobile ecosystem, began this work years ago prior to standardization efforts, then moved to interoperability tests in 2017 and 2018, and ultimately commercialized mmWave in 2019 launching multiple flagship smartphones. Last year, the Company showcased 5G mmWave speeds of over 5 Gbps.

Qualcomm Technologies is to making ultra-fast 5G mmWave connectivity rapidly available to a wide array of users, and have already undertaken multiple initiatives to spread the advanced technology's footprint

Nokia offers expanded Wavence microwave solution for 5G transport

Nokia has expanded its range of mobile transport products with a new range of indoor and outdoor solutions for Communications Service Providers and enterprises.

The new Wavence portfolio provides a complete microwave solution for all use cases covering short-haul, long-haul, E-Band, and SDN delivering cost-effective high-capacity ultra-broadband transceivers to support operators with 5G networks.

Nokia is releasing two compact Split Mount solutions for 5G backhauling enabled by the new MSS-E and MSS-HE indoor units. These are compact, cost-optimized units that are the smallest on the market and provide high scalability and high throughput. The units can also handle a wide temperature range spanning -40 degrees to 65 degrees Celsius. This is achieved without fans and improves

reliability and decreases the need for periodic maintenance.

Nokia is also introducing a full outdoor nodal configuration which includes a new ultra-compact module called a Networking Interface Module (NIM). The NIM can be used equally for new deployments or upgrades to the installed UBT base. This flexible, zero-footprint solution can be easily plugged onto a standard Ultra-Broadband Transceiver (UBT) to enhance its outdoor capabilities, offering multiple directions, multiple interfaces, and carrier aggregation. One NIM attaches to all UBT types, specifically UBT-m (80GHz), UBT-T (Twin), UBT-S (Single).

The all-inclusive Wavence portfolio provides best-in-class microwave in traditional bands (6-42 GHz), and E-Band (80 GHz) leveraging Nokia Bell Labs innovation. It provides the

maximum efficiency with 100 percent Carrier Aggregation, including for all 5G backhaul use cases across different frequency bands.

It also provides enhanced security protection via the encryption on 5G microwave radios as well as readiness for FIPS (Federal Information Processing Standards) certification and encryption.

"These new products further enhance Nokia's industry-leading Wavence portfolio and highlight our leadership in packet microwave and in both the short-haul and long-haul segment. Wavence's full-packet architecture and its industry-leading innovations both in E-Band and traditional bands are key to delivering effective 5G mobile transport," said, Giuseppe Targia, VP Mobile Networks Microwave & Custom Solutions Business Unit at Nokia.

Nokia, Ooredoo Kuwait partner to boost 5G Fixed Wireless Access



Nokia and Ooredoo Telecom have entered into an agreement where Nokia will be supplying Ooredoo Kuwait 5G Fixed Wireless Access (FWA) equipment for the operator's customer premises.

An early adopter of FWA, Ooredoo is now offering the Nokia FastMile 5G Gateway as a premium internet device for residential and business customers. Ooredoo Kuwait is using FWA to extend the reach of its fiber network to premises not easily connected with direct fiber lines. This development will support the Ooredoo to significantly

increase its fixed broadband customer base across the country.

Nokia's self-installable 5G FWA gateway incorporates Wi-Fi 6 with self-optimizing mesh technology to optimize performance in real time and includes advanced antenna designs with higher throughput and better coverage resulting in improved customer experience and a lower operational cost for Ooredoo.

Commenting on the partnership, Essa Haider, director of network planning and design, Ooredoo Kuwait, said, "5G

Fixed Wireless Access is essential for Kuwait's economic growth and diversification, and we're delighted to be partnering with Nokia for this."

Meanwhile, Rima Manna, head of the Middle East market unit, Nokia MEA, said, "We are extremely proud to have been selected by Ooredoo to offer our FWA FastMile solution to customers who want a great experience and easy installation. With this significant deal, we strengthen our partnership with Ooredoo Kuwait and looking forward to working with the operator more closely to deliver compelling 5G experiences to its customers."

Ooredoo Kuwait was awarded the "Best Internet Service Provider" at the annual Service Hero Awards for the year 2020 in recognition to the company's long-standing commitment to its customers. The company remained focused on launching new and innovative products for its customers, signing an MoU with the National Bank of Kuwait (NBK) to develop digital services, products and solutions that contribute to enriching customer experiences.

Nokia delivers robust start to the year with strong financial results



Nokia announced the company's financial results for the first quarter 2021, registering a strong start to the year with constant currency net sales up 9% year-on-year, driven by strong growth in network infrastructure and

solid growth in mobile networks; reported net sales increased 3%.

Enterprise constant currency net sales are up 18% year-on-year, as Nokia gained 63 new customers, more than

doubling the number it added in Q1 2020; reported net sales increased 14%.

The company announced a comparable gross margin of 38.2% (reported 37.9%), reflecting improvements in mobile networks, mainly driven by 5G growth and favorable product and regional mix, and broad improvements across network infrastructure.

Comparable operating margin reached 10.9% (reported 8.5%), with improvements in comparable operating profit across all business groups, while comparable diluted EPS registered EUR 0.07; reported diluted EPS of EUR 0.05. Nokia recorded a strong cash flow performance, driven by operating profit and good collection of receivables.



Navigating the data processing highway

Data-driven decision-making has become a realistic strategy for businesses today. Especially with the trend in cloud computing and data management strategy such as Data as a service (DaaS) on offer, more and more companies are turning to the solution for data integration, management, storage, and analytics. Rather than formulating strategies motivated by gut feelings and half-baked opinions, it is more reliable and sensible to use the available data to make business decisions.

Data mining is integral to business intelligence and helps generate valuable insights by identifying

patterns in the data. For instance, analysis of historical information of a company helps to identify trends and aid in making decisions for the future based on successful and profitable practices, thereby reducing the occurrence of risky assessments.

There's no doubt that data is a valuable tool for any business. A suitable example is online retail giant Amazon. Its focus on data-driven marketing strategy analyses billions of data points to test different things in order to find out what works and what does not. No wonder in 2020, the company reported net sales valued at \$125.56 billion, a 43.6% increase compared to \$87.44 billion in the same quarter in 2019.

Data encouraging business growth
Many businesses are already adopting data-driven decision-making (DDDM) to grow their business.

Decision-makers are using data to find out cost-effective ways of recruitment and product promotions, marketing campaigns optimization, fraud detection, customer loyalty improvement, leads generation, selection of publicity channels, etc.

Even non-commercial cases of data use, for example, in the transport sector are huge. Transport authorities can manage and develop their timetables, build new infrastructure,

manage staff and control the flow of passengers using public transport. Experts are using big data to analyse accident trends on the roads and develop effective preventative solutions. Efficient traffic and crowd management models are already being implemented in major cities around the world. Geographic and spatial data mining that extracts geographic, environmental, and astronomical data to understand topology and distance is being extensively used in the travel, navigation, and governmental sectors.

New technology such as artificial intelligence (AI) will use data to code software that has the potential to change industries such as agriculture, health care, logistics, manufacturing, customer care to transportation through automation making them many times efficient than we know them today.

Over the years, the use of data science has gone beyond just being a tool for optimization, and has become an essential component to build new products and services.

However, to be a data-driven organization, strategic implementation of data management must be in place to achieve improved organizational consistency, increased productivity, greater collaboration and communication, faster and knowledgeable business decisions.

Role of ICT players

Creating intelligent systems that learn, adapt, and act autonomously rather than just execute pre-defined instructions offers many opportunities and challenges for the ICT sector.

ICT players would do well in considering the below areas for leveraging data science for their customers:

Skilled resources: Acquire highly skilled cross-functional experts who can provide support and development in the creative, user experience, analytics, technology aspect of

businesses. Adoption of the best programs in data science, business analytics, and big data will be worth the consideration.

Agile software development: With the trend of virtualization on the rise, it is key to adopt a collaborative development approach coupled with design-thinking of software to deliver proofs of concept in order to maximize responsiveness to changing business needs.

Tried and tested solutions: Save data processing, development, and time by leveraging industry best practices, third-party data sets, accelerators, and tested algorithms that aim to meet customers' needs.

Mobile team: Real-time data processing systems such as bank ATMs, traffic control systems, and modern computer systems such as the PC and mobile devices require continuous data management. Thus, it is necessary to promote innovation and collaboration through trained teams who can be deployed at any location on demand.

PaaS offerings: The migration of applications towards the cloud will warrant Platform as a service (PaaS) that will enable the delivery of everything from simple cloud-based apps to advanced, cloud-enabled enterprise applications on a pay-as-you-go basis and accessibility over a secure internet connection, thereby fast-tracking the value of data science.

Collaborative ecosystem: Operators, vendors, and other ICT stakeholders must collaborate to support the growth of startups by adopting leading industry practices, based on the latest technology and business innovations.

By analysing data coming from the various application sources and historical data, it's possible to get a clear understanding of the business activities almost anywhere and anytime. From using environmental sensors to create predictive models, to implementing recommendation

algorithms to increase sales in the retail industry, effective data processing is critical for every project.

Big data has great potential to help produce new and insightful information, and there is a growing debate on how businesses, governments, and citizens can maximize the benefits of big data. ICT players lie at the heart of digital data storage, retrieval, and transmission with the potential to make business more efficient, effective, and responsive to customer needs. The ICT industry is a major development channel for business activities. It acts as a facilitator for the supply and allows access to a wide range of online services, increasing efficiency in institutions and corporations, with cost-effective promotion and enhancement of communication.

Having big data become a buzzword in today's digitally driven era, the ICT industry will have a major role to play in harnessing data-driven decision-making to shape a better and simpler future for humanity. **TR**



ICT players lie at the heart of digital data storage, retrieval, and transmission with the potential to make business more efficient, effective, and responsive to customer needs





What does the surge in electric vehicles mean for the ICT industry?

The use of electric vehicles as a means to cut transport emissions and ride over the fluctuating price and availability of oil is gaining momentum worldwide.

Germany, Europe's biggest economy, last year launched a 3 billion euro (\$3.6 billion) plan for consumer rebates for buying electric vehicles and wall-box chargers and putting away their old vehicles, and fostering innovation.

According to Chinese auto industry body CPCA data, electric vehicle maker Tesla sold 18,318 China-made

vehicles in February as compared to 15,484 in January 2021.

The tightening CO2 emission standards in Europe and China have resulted in carmakers racing to develop electric cars. Even luxury carmaker BMW is planning for half of its sales to be fully-electric models by 2030. The company's sustainability goals include reducing its CO2 emissions from the entire lifespan of its vehicles - from raw materials and production process

to their use on the road - by a cumulative 200 megatons by 2030.

Other auto companies, to name a few, joining the e-vehicle route are Volkswagen and General Motors. VW has already developed its platform for production while GM has plans to exclusively offer electric vehicles by 2035. As per market reports, despite the pandemic, deliveries of EVs grew year-over-year in 2020 by 43% globally.

Tech giants eyeing EV sector

Many tech companies are collaborating with carmakers in the hopes of gaining from the potential market opportunity for software applications such as autonomous driving.

Chinese tech giant Huawei is planning to make electric cars under its brand and the company has filed two patents in the technical field of electronic circuits and power electronics technology. Huawei has been developing technologies for EVs for years including in-car software systems, sensors for automobiles, and 5G communications hardware.

The company has been awarded patents related to EVs, including methods for charging between electric vehicles and for checking battery health.

Xiaomi, one of the world's biggest smartphone makers recently announced that it will invest \$10 billion over the next decade in a subsidiary dedicated to electric vehicle production. However, details of the company's strategy for entering the automotive market on whether it will focus on manufacturing or software have not been revealed. Apart from smartphones, Xiaomi also makes a range of gadgets including CCTV cameras, electric shavers, and toothbrushes, light bulbs, watches, and scooters, etc.

Moreover, Apple CEO, Tim Cook mentioned recently "internal investigation" for projects going on in the company but again was not

forthcoming whether it would be an automotive project. Apple has not confirmed any vehicle project and is also not clear if it will make cars or the gadgets to be used inside them. However, rumours about the company meeting with automakers including Nissan and Hyundai about partnering on a vehicle are already out. Some reports also suggest that Apple has patented some vehicle features, such as sending alerts to drivers, reducing motion sickness, and climate controls.

Sensing the tailwinds, as an initiative to fight climate change through its services, search engine giant Google has announced climate-focused changes to be implemented in the Google Maps app. The app will prompt drivers to take routes that generate the lowest carbon emissions based on traffic, slopes, and other factors. The company has said that the feature would be launched in the US sometime this year and would be available to other countries.

Bridging the transition

Interestingly, this gradual transition from internal combustion engines to electrical engines for vehicles will warrant a change in the architecture and role of information and communication technology (ICT) for the vehicle of the future.

Studies have shown that ICT, in the form of electrics, electronics, and software in vehicles, has become essential for the automotive industry. The studies state that when it comes to electric vehicles, ICT forms the backbone for all functions and that the architectures and technologies for vehicle ICT must be ready for innovations.

The adoption of e-vehicles may seem to give a picture of a perfect world with low emission and clear blue skies but it does not come without some challenges; that is where the ICT industry will have a bigger role to play.

Cellular connectivity: Electric cars need to be charged and recharged

time and again. Drivers cannot afford to miss charging stations when they are out on the road. They would have to be informed about the nearest charging stations. Mobile communication will have a big impact in enabling charging stations with cellular connectivity so that drivers can locate and reserve charging spots for their EVs, thereby saving stress and time on the road. Newer networks based on 4G and 5G technologies offer benefits in terms of real-time operation, including low latency and long-term availability.

Battery electric vehicles (BEV):

Battery electric vehicles (BEV) produce less CO₂ than conventional vehicles resulting in lower fuel emissions. However, continued use depends on effective ICT based enabling technologies to link BEVs with its environment to provide information such as real-time battery charge levels, location of nearest charging infrastructure, route options to optimize battery performance, and energy price in a given area within the BEVs vehicle grid communication (VGC) infrastructure. Using data analytics, ICT service providers can gain insight into user charging behaviour, charging times, economic and environmental saving information to improve the user experience, smart grid operation, and widespread adoption of BEVs.

Cybersecurity challenge: Electronics are an integral part of e-vehicle control. There is a major shift from hardware to software in the automotive industry. However, because of software configuration, there is an increase in vehicle connectivity options, leading to automotive cybersecurity exposure. Malicious players can have access to electronics controlling engine ignition, acceleration, steering, and braking that have the potential to endanger lives and even damage the reputation of carmakers. ICT players in the cybersecurity space would do well in developing security protocol standards in the security of vehicle-accessible external devices, in-vehicle system intrusion, detection, the security of vehicular edge

computing, and security-focused big data analytics for connected cars.

Energy demand management: The adoption of electric vehicles will increase the strains on electricity supplies and networks. The environmental performance of electric cars relies on the supply of electricity from non-polluting energy sources. Reports show that energy and telecommunications services are increasingly intersecting. ICT solutions like smart grid technology that blends electricity provision and consumption with advanced communication requirements have to be incorporated in the e-vehicles ecosystem. An open-access provision allowing smart meter service providers and utilities access to data capacity over telecommunications networks is crucial for the environmental and commercial success of the electric vehicle market.

A bright future?

The UAE's first ultra-fast electric vehicle charging stations have already been installed. Such installations are expected to promote the mass adoption of EVs to improve air quality and reduce vehicular pollution in support of the UAE's sustainability ambitions.

The Emirate also launched a fleet of environmental-friendly Lithium Titanate Oxide (LTO) electric buses powered by the fastest charging lithium battery in the world – the LTO battery – which can be charged in less than 20 minutes. According to reports, replacing one diesel bus with an electric bus is the equivalent of reducing harmful emissions from 27 passenger cars driven for one year and 12,175 gallons of diesel over ten years.

Analysts say that the EV industry is set for a \$5 trillion market opportunity over the next decade accelerated by the pent-up demand globally around electric vehicle technology.

All this sounds like a good enough reason for the ITC industry to brace for an inevitable future of electric-powered mobility systems. **TR**

Australia completes 26 GHz 5G spectrum auction raising \$650m

The Australian Communications and Media Authority (ACMA) has announced the successful completion and outcome of the 26 GHz spectrum auction.

This 26 GHz or 'millimetre wave' spectrum is a critical enabler for 5G networks to reach their full potential, because it allows extremely large amounts of data to be carried.

The Morrison Government committed that 2021 would be the 'Year of 5G'. This successful allocation of millimetre wave spectrum to five successful bidders through this auction is part of meeting that commitment.

Minister for Communications, Urban Infrastructure, Cities and the Arts, The Hon. Paul Fletcher MP said, "With access to 15-year licences for millimetre wave spectrum, network operators will now be able to provide fast, high capacity, and low latency services to build on and enhance their existing 5G networks."

Five bidders were successful in securing spectrum licences in the 26 GHz auction, with a total value of \$647.64 million. Telstra, Optus and TPG Telecom have each secured significant allocations of spectrum across all 27 geographic areas available at the auction, with Telstra securing 150 lots for \$276.6 million and Optus securing 116 lots for \$226.2 million. TPG secured 86 lots for \$108.2 million. Dense Air, in Sydney and Melbourne, and Pentanet, in Western Australia, were also successful in securing spectrum that will allow the deployment of new and innovative 5G services.

ZTE partners Beeline for Uzbekistan's largest virtualized SDM

ZTE Corporation, a major international provider of telecommunications, enterprise and consumer technology solutions for the Mobile Internet, together with Beeline, one of the largest operators in Uzbekistan of VEON Group, has deployed the largest virtualized SDM (Subscriber Data Management) platform in Uzbekistan. This marks an important step in digital operation for Beeline to satisfy one third its local users with a better user experience.

By virtue of the virtualized SDM platform, ZTE has helped Beeline improve the network performance while reducing the overall OPEX costs by 60%. At the same time, the network reliability has increased to 99.9999%, thus ensuring the security and reliability of user data. As the user data management center of the mobile network, the vSDM platform can manage 2G, 3G, 4G LTE network and EIR (Equipment Identity Register) to flexibly meet such requirements as integrated development of multiple networks and

high-capacity data maintenance. In addition, this platform also meets Beeline's needs for 5G evolution.

During vSDM platform deployment, ZTE iEPMS (Intelligent Engineering Project Management System) has been employed for the full-process professional management of key benchmarks, such as equipment arrival, installation and debugging, first call connection, PAT test and network cutover, to guarantee efficient network deployment.

Despite various risks brought by COVID-19, ZTE, backed up with its innovative cloud delivery mode, has adopted its advanced intelligent network deployment tools to efficiently complete the equipment inspection, automatic cloud platform commissioning, automatic NE deployment and O&M support. Eventually, the company has successfully constructed the largest vSDM platform in Uzbekistan.

Canada decides on digital taxation of tech giants

In a strategic move to have a tax system that promotes fairness, the Canadian government's Federal Budget 2021 confirms the implementation of a digital services tax (DST) at a rate of 3% on revenue from digital service providers such as Amazon, Facebook, and Netflix that rely on data and content contributions from Canadian users.

"The government is committed to ensuring that corporations in all sectors, including digital corporations, pay their fair share of tax on the money they earn by doing business in Canada," a statement derived from the government. The DST would apply to large digital businesses with gross revenue of 750 million euros or more. To be effective on January 1, 2022, Canada intends to take action until an acceptable multilateral approach comes into effect. It is estimated that this new taxation policy will raise \$3.4 billion in revenue over five years beginning in 2021-22.

Until now, US tech giants have operated without following specific regulations in Canada. This is an unfair case in comparison to local broadcasters and cable players that mandatorily contribute a share of their revenues to subsidize production. Previous concerns about over-the-top (OTT) usage in Canada have been discussed as Netflix entered the Canadian streaming landscape. Therefore, taxing US streamers in the near future sorts out their advantage of local incentives, currency savings, soundstages, and production crews to make original productions.

For the most part, the proposal is consistent with the Organisation for Economic Co-operation and Development (OECD) guidelines on digital taxation. Applicable to both foreign and domestic companies, the DST will be levied on revenue from online marketplaces, social media platforms, online advertising, and user data.

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
19
MAY MARCH

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

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
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26
MAY

Latest updates on: www.telecomreview.com

IPv6 webinar

For the second consecutive year and following the success of the first edition, Trace Media and Telecom Review are organizing the IPv6 webinar entitled "IPv6: Expanding the influence of IPv6+ to enable the digital economy".

Place: virtual



16 JUNE

Digitizing the capacity industry

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

Place: virtual



27 JULY

Telecom Review Leaders' Summit 2021

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

Place: InterContinental Dubai Festival City and virtual



8 DECEMBER

Latest updates on: www.telecomreview.com

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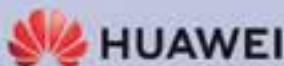
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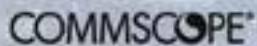
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