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FOR SAMENA TELECOMMUNICATIONS COUNCIL'S MEMBERS

BUILDING DIGITAL ECONOMIES

Featured

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Acting General Director
TRA - Bahrain

THIS MONTH

CONNECTIVITY FOR EVERYONE:
NEW FUNDING AND FINANCING APPROACHES

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Connectivity for Everyone: New Funding and Financing Approaches

For Telecom Operators, current times point to a certain level of uncertainty, rife with disruptions, requirement of re-thinking business models, and re-defining the operators' multi-dimensional role in the digital space. While on one hand, digitization has been reshaping the industry landscape in multiple ways, with the telecoms sector expected to experience tremendous digital disruptions in times to come; one the other hand, we still hear of connectivity not being present everywhere, leaving billions still without broadband connectivity and not being able to benefit from the trillions of dollars operators have already invested in developing infrastructure and bringing technology coverage. Combined this bitter reality with the telecom business's overall slow growth -- greatly reduced EBITDA and cash flow margins, considerable shift in competition dynamics in the communications market, and data having become central to the core operations with its own share of opportunities as well as challenges -- and we have a major concern to address as Industry.

Rebuilding market position in the age of digitization and 5G is crucial for business sustainability and for fostering innovation, and thus all efforts should be exerted toward capturing the full digital potential, including for enhancing profit margins. At the same time, however, realization demands that we do keep in mind that in most of the SA-ME-NA region and in other parts of the developing world, many hard to reach areas where broadband connectivity has yet not arrived, do remain an untapped profit-margin area for the discerning investor. This is despite the costs involved to get there.

The primary issue in the still-persisting connectivity gap is that not only are there still one billion people still not covered by mobile broadband networks, but also that a hefty 2.7 billion potential users, who do have technology coverage, are unable or unwilling to use it. The latter in itself is a major issue of perception and "technology relevance", which also needs

to be overcome. Nonetheless, for the purpose of drawing attention to the intended core issue here, it is the need for accelerated investment that demands the limelight.

There are clear gaps that need to be filled when it comes to providing connectivity with affordability and at reasonable internet speeds. In order to fill the connectivity gap, most definitely, gaps in funding and financing communication infrastructure development first need to be filled. Traditional business models for providing telecoms services have come and can go only so far; connecting the next billion will be substantially more difficult than it was early on when the telecom/ICT landscape was comparatively simpler. Traditionally, service provisioning has been driven by revenue and quick return-on-investment approaches, due to which it has not been practical and financially viable for operators to reach into far-flung areas. Even where USF models (which require the private sector to contribute) have been implemented to bring connectivity to hard to reach areas, these have not been issue-free, both in terms of transparency and efficient utilization. Governments, by themselves, lack revenues, models, expertise or even structures to substantially fund development of networks that are required to connect everyone. Even international financial bodies known for funding development projects are also unable to fund every major ICT project across every needy areas. The result is a gross insufficiency of funding.

So as the once not-so-visible issue has finally sprung to surface and the Industry, including premier global ICT development agencies, recognize financial and funding gaps as being a serious concern -- which must be addressed both in terms of infrastructure availability and catalyzing meaningful connectivity for the purpose of including everyone into the growth of the digital economy -- it has become pertinent that we also look at the current business models and certain network operator

Bocar A. BA
Chief Executive Officer &
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practices in service provisioning that have, in some ways, also hindered connectivity availability --due to either cost factors involved or due to insufficient customer awareness, or even due to lack of initiatives by the Industry that create relevance among potential end-users in the use of broadband.

Surely, there is a need to rethink current business, financing, and investment models. In doing so, the focus should not only be on making infrastructure available but also on addressing gaps in the *meaningful* use of connectivity provided.

As Industry, we have a daunting task ahead of us. And SAMENA Council looks forward to assisting in fulfilling this task with all its resourcefulness and commitment to facilitating the Industry and its leaders.

Positioning the Kingdom of Bahrain Among the Leading Digital Economies

TRA-Bahrain Continues To Deliver On National Expectations

> *TRA believes in creating value; positioning tele-communications as a pillar of social and commercial growth for the Kingdom of Bahrain. Since 2002, more than 2,600 jobs were created – a 50% increase – and the industry has accounted to 4% of the GDP.*

Leveraging the best available technology and regulation to create a competitive and innovative telecom and ICT sector remains a core mission of the Telecom Regulatory Authority (TRA) of the Kingdom of Bahrain. It is this mission that has helped position Bahrain among the most progressive ICT development nations with the SA-ME-NA region. Bahrain was the first country in the MENA region to introduce the Fixed Number Portability and in 2011, 22,000 consumers switched providers.

The Telecommunications Regulatory Authority (TRA) was established in 2002 promulgating the Telecommunications Law in the Kingdom of Bahrain.

The Board of Directors oversees the activities of TRA led by its Acting Chairman, Sh. Hamed bin Mohamed Al Khalifa. The Acting General Director, Sh. Nasser bin Mohamed Al Khalifa, is responsible for the day-to-day operations of the Authority.

TRA carries out its duties independently and in a transparent and non-discriminatory manner. Ever since its inception, the TRA has focused on liberalizing and developing the telecoms sector by promoting an effective and fair competition between established operators and new entrants while protecting the interest of consumers.

The drive to pave a path for a more robust and dynamic telecoms industry continues with the change in market dynamics, fuelling an unstinting resolve to augment service levels and exceed expectations on all fronts. TRA believes in creating value; positioning telecommunications as a pillar of social and commercial growth for the Kingdom of Bahrain. Since 2002, more than 2,600 jobs were created – a 50% increase – and

the industry has accounted to 4% of the GDP. Earlier, following negotiations with GCC nations, TRA introduced a cap on mobile roaming charges. Furthermore, it has insured that the regulatory environment stimulates competition; which in return has a led to a tariff reduction of an average of 25% across a number of services.

Focused Strategy

The TRA is constantly reviewing its regulations and framework based on a number of principles including consumer protection and fostering competition. Initiatives include regulating bulk messages and monitoring quality of telecommunications services.

With the aim of achieving its mission and vision objectives, as well as ensuring it is moving in the right direction, TRA has designed a Focused Strategy Framework, which outlines the Authority's guidelines to create a communications environment that enriches the social and commercial fabric of the Kingdom of Bahrain.

TRA is ensuring fulfillment of its plans and initiatives in accordance with key strategic market priorities:

Foster Competition
Initiatives and effective regulation that foster the continued growth and development of the telecommunication sector by way of effective and fair competition.

Optimised Technologies
Initiatives that encourage the adoption, deployment, and optimization of the latest technologies that support the growth of the market and deliver higher quality of services to consumers.

Consumer Empowerment
Initiatives that provide knowledge and tools to empower the consumers and enrich their experience of the telecommunications

services and to allow them to make well-informed decisions.

Ubiquitous Broadband
Initiatives undertaken to ensure that broadband services of high quality and competitive prices are available to all local stakeholders.

Security and Cyber Safety
Initiatives that support a safe and secure telecommunications infrastructure to deliver highly reliable Electronic Communication Services.

Efficient Regulator
Initiatives that adapt, enhance, and update the framework, processes and tools used by the Authority in the implementation of its duties.

Dynamic & Effective Regulatory Framework Initiatives undertaken to adapt regulations over time, with the aim of continuously

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reviewing, updating, and improving the telecommunication regulatory framework, and maintaining proportionate focus where necessary.

Achievements
2019
- TRA wins GCC Best Employer Brand Award
- TRA's project for Batelco's separation wins best regulatory initiative in MENA for 2019

2018
- TRA awarded "Finance Team of the Year – Public Sector"
- TRA wins "Excellence in HR – Employer of the Year" award
- TRA wins CommsMEA's "Regulatory Initiative of the Year" Award

2017
- TRA wins Best Nationalization Initiative in GCC
- TRA awarded "Employer of the Year – Public Sector"
- CIOS Award – Top 100 Cyber Security Leader in the Middle East

Guided by the Fourth National Telecommunications Plan (NTP4), the

TRA, throughout 2018, undertook a number of initiatives geared towards facilitating the deployment of state-of the-art technologies for the ultimate benefit of

As the Kingdom of Bahrain moves towards the next era of telecommunications, TRA sets the stage for 5G implementation. A 5G Working Group chaired by TRA was established, for developing and implementing the action plan for the introduction of 5G commercial mobile networks in Bahrain.

consumers. The highlight of TRA's efforts in this direction, was the development of a new regulatory framework underpinning the separation of Batelco and the deployment of the National Broadband Network (NBN) supported through a single fibre network – a key NTP4 objective.

The TRA has also developed regulations aimed at regulating the deployment of new telecommunications towers – a most important component of the telecommunications infrastructure; and rectify the existing ones in accordance with international best practices, focusing on both the functionality and aesthetics. The regulation also encourages sharing of towers among operators, thus ensuring there is no unnecessary multiplicity of the towers.

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Aimed at empowering consumers and ensuring that they receive the best-in-breed services, TRA published an updated Quality of Service ('QoS') Regulation applicable to licensed operators in the Kingdom. The updated QoS Regulation sets out renewed key QoS targets for licensed operators to achieve in delivering services to consumers.

Building on its commitment to constantly improve consumer experience, a new 'Consumer Dispute Regulation' was

TRA's Project for Batelco's Separation Wins Best Regulatory Initiative in MENA for 2019

developed by the TRA to improve the dispute handling process; establishing the principles and procedures for the submission, handling and resolution of a Dispute arising between a Subscriber and a licensed operator.

According to the Global Competitiveness Report published by the World Economic Forum in October 2018, Bahrain ranked 3rd globally in internet user percentage at 98%; 5th globally in mobile broadband penetration rate (147.3%); and 10th globally in mobile penetration rate (158.4%).

A new integrated complaint and inquiry management system – featuring a consumer portal where consumers could easily log in and submit details of their complaint and supporting documents; was also launched in order to maintain effective communication between TRA, consumers and licensed operators.

Keen to better serve all society segments, including disabled consumers; TRA launched a video call service for its Consumer Call Center, which enabled any android user to initiate a video call directly to TRA's Consumer Call Center, to submit their complaints and enquiries.

Awareness campaigns were also conducted throughout the year to inform and empower consumers. 'Know Your Rights'; 'Your Sim Your Responsibility'; and 'I am Roaming Ready' being the highlight. As part of its initiatives under the Fourth National Telecommunications Plan to develop human resources capacity in the telecommunications sector, TRA launched a number of initiatives, and conducted workshops & sessions throughout the year including the "VAT for Telecoms Workshop" in collaboration with KPMG for its employees and licensed telecom companies, and '5G Masterclass Training

Course', amongst others.

Under its staff development initiative the TRA implemented several initiatives including the Culture Transformation Program, imparting EQFM based training to new TRA employees; 'Lean Six Sigma Training'; 'Mini Mobile World Congress' workshop focusing on 'New Technologies', with leading global ICT infrastructure provider, Huawei; and a Workshop, Leadership Program, in Cooperation with Global Executive Education and BIBF.

The Kingdom's telecommunications sector witnessed continuous competition and achievements in providing diverse and high-quality telecommunications services to both residential and businesses users. Some mobile services prices decreased by 27% between 2017 and 2018 and as much as 54% between 2013 and 2018. Fixed broadband prices also fell by 7% between 2017 and 2018 and as much as 82% between 2013 and 2018.

The steep decline in the services' prices contributes to the significantly high penetration rates of telecommunications services in Bahrain, which have constantly remained amongst the highest rates globally, over the past several years.

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2018 also witnessed a 36% reduction in mobile number porting requests (14,449

compared to 22,552 requests in 2017); and 64% reduction in fixed number portability requests (2817, compared to 7800 requests in 2017).

TRA also led from the front on the global telecommunications arena. Alongside attending many international conferences and seminars, including the noted ITU 20th Plenipotentiary Conference (PP-18); TRA represented the Arab Region within ITU-T Study Group 17 for Cyber Security, and hosted the 16th Annual AREGNET Conference in the Kingdom of Bahrain.

TRA won the prestigious CommsMEA's "Regulatory Initiative of the Year" Award for 2018, at the 13th Annual CommsMEA Awards in Dubai, UAE, for its efforts in developing the Public Radiocommunications Stations Regulation aiming at ensuring secure and advanced telecommunications infrastructure.

In acknowledgement of the Authority's efforts that demonstrated the greatest commitment to its financial policies & procedures combined with the key initiative to improve operational effectiveness, TRA was presented with the "Finance Team of the Year – Public Sector" award, at the 'CFO Strategies Forum MENA', in Dubai, UAE.

For its outstanding employee development and training programs, TRA was awarded the "Excellence in HR- Employer of the Year" Award, at the 2018 Future Workplace Awards, in Dubai, UAE.

Earlier, an accomplishing year, 2017 had ushered in a new era in the Bahrain telecommunication sector, setting

TRA Bahrain received an award for "Finance Team of the Year-Public Sector".

the stage for the introduction of next-generation ICT infrastructure, while enhancing the Kingdom's presence on the global level.

Initiating the implementation of the Government policy outlined in the Fourth National Telecommunications Plan ("NTP4"), the TRA commenced development of a new economic regulatory framework, defining the rules and obligations for operators to support the Plan's goals and deliver the single network policy, one of the core objectives of the plan.

In line with the Kingdom's Vision 2030 and the goal of becoming a 'Smart Kingdom', TRA started establishing appropriate support and incentives to promote ICT investment as well as training programs and capacity building to foster the development of a Bahraini knowledge base, talent and entrepreneurs in the internet space – committed to transform the nation into a leading regional business and ICT hub for internet businesses, content and applications, by 2018.

A core objective set by TRA in this direction is the development of optical- fiber based National Broadband Network (NBN) capable of delivering ultra-fast broadband to consumers and businesses across the

Kingdom; a key development underpinning all of the policies established by NTP4.

A clear spectrum policy plan has also been adopted in 2017, for assignment of appropriate bands through clearly identified processes in order to support the continued evolution and demand in the mobile data services.

A review of the entire supply chain of international connectivity was also set in motion to assess the effectiveness of current regulation relating to the ability of licensed operators to access international connectivity at cable landing stations in Bahrain.

Another highlight of 2017 was Initiating the groundwork for the implementation of 5th generation of mobile networks (5G). The Telecommunications Regulatory Authority laid down the roadmap to establishing a 5G ecosystem in Bahrain, in its position paper titled: 'Fixed Point to Point Links', along with a workshop with the cconcerned entities, to discuss and facilitate the imminent deployment of 5G networks.

In light of the critical importance of the telecommunications sector to the Kingdom's digital economy and businesses, TRA issued the 'Critical

Telecommunications Infrastructure (CTI) Risk Management Regulation' in 2017; an effective framework to elevate the telecommunications sector cyber security readiness, and harmonize efforts between local and global best practices.

Bahrain also attained a mature stage of Cyber Security readiness as per the assessment of the International Telecommunications Union's (ITU) 'Global Cyber Security Index 2017'.

TRA also continued to shine on the world stage. Among others, TRA was awarded the 'Employer of the Year – Public Sector' at the Human Capital Forum Mena 2017, for the second time consecutively.

The operational excellence of TRA reaping rewards; Kingdom of Bahrain stood 1st in the Arab world, and 31st globally, in the ICT Development Index (IDI). The Kingdom was also ranked 1 globally for mobile broadband penetration, and 2nd for internet users.

TRA remains steadfast in its commitment to transform the Kingdom's telecommunication sector; constantly breaking new grounds, and creating new avenues of opportunity, progress, and prosperity.

TRA Bahrain Speaks to SAMENA Council

Shaikh Nasser Bin Mohamed Al Khalifa
Acting General Director
TRA - Bahrain

5G in combination with the Internet of Things will bring countless opportunities that will require buy-in from investors beyond the Telecoms and ICT sector, as the applications of these new technologies significantly impact every sector imaginable. We have received new licensee requests from IoT companies and there seems to be an increased interest in investment from IoT centric businesses.

Q. How has the TRA Bahrain made significant strides in fulfilling the Bahrain Government's digital vision of positioning Bahrain among the leading ICT developing nations in the world?

A. At the end of May 2019, Batelco, the incumbent was legally separated into two separate, independent entities. Bnet was formed as the new wholesale infrastructure provider, and Batelco remained as a retail services provider, which leases Bnet's Broadband Infrastructure to resell fiber-optic fixed internet services to end-users, as is the case for other licensees in the Kingdom. For this to materialize, we established a new economic regulatory framework in line with the government's policy directions under NTP4, then issued the separation guidelines and reference offer, setting out the terms and conditions under which the new entity, Bnet, would offer its services to all other licensees, and changes to the telecom law that preceded all of these key milestones and the creation of a compliance committee which we are finalizing now.

It's worth noting that very few countries have attempted this, as establishing a national broadband network is a monumental undertaking. We're the first and the only regulator to have done it successfully in the MENA region as of yet, and completed this project in thirty-six months, which is unprecedented.

Q. What are the TRA's major achievements over the last two years with regard to industry development, progressiveness in regulatory approaches, and delivery of digitally led public services?

A. Establishing the National Broadband Network is among the TRA's most significant undertakings, the impact of which will be felt for generations to come. It is already playing major role in developing Bahrain as an ICT Hub for the region by attracting leading global content and service providers to the Kingdom of Bahrain, such as Amazon Web Services.

We've reviewed the Telecoms Law of Bahrain and our licensing frameworks to adopt new technological developments in the sector so as to future-proof and cope with the demands of tomorrow. One of the major objectives of NTP4 is to target 95% percent coverage of all households with fiber-optic infrastructure providing a minimum of 100 Mbps speeds, and 100% coverage for businesses and mobile public stations with a minimum of 1Gb. We've made great progress in this respect and are well on our way towards achieving related goals.

The Government of Bahrain recognizes that effective and sustainable competition plays an important role in creating a strong and dynamic sector. In this regard, Government considers "sustainable competition" to mean an environment in which operators compete effectively on the basis of price and quality of service, while being able to invest sufficiently to support the deployment of new technologies and innovative services

Q. What are the key dynamics of Kingdom of Bahrain's Telecoms/ICT sector, and how has the Batelco Separation project translated into new opportunities for the sector and the consumer?

A. The Government of Bahrain recognizes that effective and sustainable competition plays an important role in creating a strong and dynamic sector. In this regard, Government considers "sustainable competition" to mean an environment in which operators compete effectively on the basis of price and quality of service, while being able to invest sufficiently to support the deployment of new technologies and innovative services, with entry based on a long run business model rather than short run arbitrage opportunities. Bnet, the newly established infrastructure provider, is responsible for deploying and operating a ubiquitous ultra-fast national broadband network based on fiber-optic technology, and is capable of delivering wholesale products and services that achieve the performance targets referenced in the NTP4 and in line with the industry best practices.

The TRA further recognizes that effective and sustainable services-

based competition is critical for setting a sustainable environment, which should be conducive to operators' ability to invest, deploy new technologies and innovative digital services, and whereby long-run business models can be adopted and are made to thrive.

Q. As the Acting General Director, how do you view the onslaught of 5G and IoT in Bahrain in terms of opportunities and challenges?

A. 5G in combination with the Internet of Things will bring countless opportunities that will require buy-in from investors beyond the Telecoms and ICT sector, as the applications of these new technologies significantly impact every sector imaginable. We have received new licensee requests from IoT companies and there seems to be an increased interest in investment from IoT centric businesses. NBN lowers the barriers to entry significantly, making Bahrain a unique destination for prospective investors and we expect that this would result in bringing more international businesses to Bahrain.

Q. In your opinion, what new approaches within the industry can better guarantee investment sustainability and improved collaboration between Operators and Regulators in the wake of 5G and intelligent "meaningful" connectivity?

TRA enabled temporary access to MNOs to 5G prime spectrum back in April 2019. We secured a total of 300 MHz in the C-band (100 MHz for each MNO) and currently we're working on allocating the 300 MHz for 5G deployment on a permanent basis by setting the adequate fees that will both enable the MNOs to invest in the 5G networks as well as generate revenues for the government.

A. TRA awarded 800 MHz and 2600 MHz frequency bands on July 2019. An award such as this has contributed towards enabling enhanced services and better coverage. Through this additional spectrum (200 MHz), Mobile Network Operators (MNOs) are now able to utilize the carrier aggregation techniques that can boost the download speeds by twofold or threefold.

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During the separation consultation process, we received requirements from operators to facilitate dark-fiber services to meet their needs for fronthaul to address the demand of 5G and Centralized Radio Access Networks. Technically, Fronthaul is the link between a mobile baseband unit and a remote radio head. The Authority considers that this service is necessary in order to allow MNOs to develop the architecture of their networks and to provide advanced mobile services. The Fiber Fronthauling Service (FFS) reflects the Fronthaul Access Service which is mandated by the TRA to Bnet as part of its Reference Offer.

Such approaches in sector-wide facilitation, which may be deemed necessary today in the wake of 5G for ensuring sound collaboration among operators and regulators, are central to TRA Bahrain's mission and long-term ICT development objectives.

5G, IoT and Bahrain's Sea of Opportunities

Not far from today, the citizen of the future will wake up to their smart home assistant, giving them weather and traffic updates for the day ahead while reading the latest news aloud. Their car will start instantly as they approach, the destination to work already preset, as the car automatically drives itself out of the garage. Out on the road, hundreds of self driving cars join the commute, driving in perfect syncronisity, each car with a preset destination, each carefully monitored by a sophisticated smart traffic management system. Augmented reality glasses use informative overlays to keep employees efficient and train new staff in the workplace. In schools, through Big Data, education becomes a personalized experience, modified to address each student's unique learning challenges. This is only a glimpse of what we have to look forward to.

We're in a time between two distinct epochs. The world is racing to cross over into the future through 5G, and the possibilities that the Internet of Things bring within reach.

We first have to grasp that 5G is so much more than an increase of speed on smartphones. 2G was about calls and texts, 3G was the introduction of mobile data, and 4G brought the arrival of applications. 5G is a combination of vastly increased speed, ultra reliable low latency and massive machine to machine communications. It's a combination that creates fertile ground for new economic growth and diversity. It makes IoT possible. Smart robotics will work collaboratively alongside human personnel. Tomorrow's smart factories will streamline production capacity and reduce errors significantly. Smart robots and drones will revolutionize warehousing and automated deliveries. This is only the tip of the iceberg as the internet comes to life in the physical world, materializing in everyday consumer technology, machinery that serve industry, and smart infrastructure that bring cities and nations

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to a new platue of interconnectivity.

While the investment in 5G infrastructure and IoT systems and machinery are a significant consideration, it is a necessity for Bahrain's prosperity that encourages revisiting old business models and value-chains to make it worth while for all parties involved. Mobile network operators, in particular, have the opportunity to evolve beyond their current revenue streams that are largely dependent on conventional data connectivity, voice calls and broadband services. Profitability in 5G and IoT means that mobile network operators can offer holistic solutions and partnerships with businesses in every sector. They become the conduit between a telehealth equipment supplier and hospitals, banks and enabling fintech services to customers, or smart factory equipment and manufacturers. The fact is, the convergeance of 5G and IoT will be central to life in every aspect, and through cross collaboration, there is a strong business case for all parties to prosper.

There's a veritable ocean of use cases being explored at the moment, which impact sustainability, lifestyle and productivity, to name only a few. We have an opportunity to lead by exploring use cases that are unique to Bahrain, and launching services from Bahrain that can serve customers beyond its borders, into

the immediate region and even further.

As of yet, the GCC has taken the lead in 5G deployment across MENA, with 12 operators that have launched commercial services and the world is looking to our region with anticipation on what we will do

> *As of yet, the GCC has taken the lead in 5G deployment across MENA, with 12 operators that have launched commercial services and the world is looking to our region with anticipation on what we will do to stay ahead in the race.*

> *5G is deployed in Bahrain and that puts us ahead of a very large part of the international market, but there is still work to be done to bring the possibilities of 5G and IoT to reality. For that to happen, we all have to make a commitment to invest in order to maintain our position as thought leaders, enablers and innovators.*

to stay ahead in the race.

Bahrain has some unique advantages that make investment here ideal. Our geography allows robust, total coverage to be less of a challenge than in other countries. We are the only country in the MENA region that has a wholesale entity for our telecommunications infrastructure, shifting competition to a basis of innovative services, and our regulatory framework allows for true competition and ease of doing business. All these factors

put together make Bahrain the perfect destination for research & development, testing and launching new products and services from international and local companies. 5G is deployed in Bahrain and that puts us ahead of a very large part of the international market, but there is still work to be done to bring the possibilities of 5G and IoT to reality. For that to happen, we all have to make a commitment to invest in order to maintain our position as thought leaders, enablers and innovators.

Mr. Mohamed Ali Al Khalifa, Senior Public Relations & Media Specialist, TRA, contributed to this article.

Bahrain Progresses toward Becoming a Major Technology and Innovation Hub

Through careful planning and bold regulatory reforms, the Kingdom of Bahrain is poised to become a major hub for finance, technology, and innovation, according to a new report released by the Milken Institute. However, Bahrain needs to continue its efforts to overcome challenges and achieve the objectives laid out in the Kingdom's Vision 2030 strategic plan launched in 2008. The report, Bahrain and the Fourth Industrial Revolution, is authored by Claude Lopez, Ph.D., Milken Institute director of research, together with research analysts Joseph Bendix and Cesar Servin. "Bahrain has developed a business-friendly environment, regulatory framework, and support system that make the Kingdom an attractive destination for global companies, investors, and entrepreneurs," said Lopez, citing a six-fold increase in foreign direct investment between 2016 and 2018. "With its skilled population, low cost of living, and continued investment in technology infrastructure, Bahrain is positioned to continue to achieve positive outcomes." The Milken Institute report points to recent policy changes that increase transparency, protect investors, align with international standards, and modernize access to Bahrain's

capital markets, which have yielded measurable results. In addition, Bahrain has enhanced support structures for small and medium-sized enterprises (SMEs) and startups that connect government agencies, investors, and other stakeholders to help businesses grow. Today, three Bahraini firms are listed among the top-100 startups by Forbes Middle East, and the Kingdom boasts the largest share of female founders in the Middle East and North Africa in the 2019 Global Startup Ecosystem Report. Bahrain's strong emphasis on startups and technology comes with challenges that need to be addressed to ensure the resilience of the new economic model. Based on their analysis, the authors identify several challenges, including the need for startups to grow into larger firms that will create more jobs, access to highly trained labor to satisfy these additional jobs, and assistance for existing firms transitioning to the new digital economy. The report offers several recommendations, including:

- Assist micro-firms to grow and offer more jobs
- Facilitate access to international talent
- Ensure private-sector wages are competitive
- Support small local firms with services that can help with the transition to digital

Bahrain and the Fourth Industrial Revolution was produced by the Milken Institute with support from the Bahrain Economic Development Board.

SAMENA COUNCIL ACTIVITY

SAMENA Council at the UN Broadband Commission's Special Session in Davos Discussed Perspectives on Private Sector Priorities Regarding New Approaches to Funding and Investment of Broadband Networks

SAMENA Telecommunications Council, represented by its CEO Bocar A. Ba and Chief Economist and Director for Sector Development Imme Philbeck discussed key private sector priorities regarding the need for new and innovative approaches to funding and investment of broadband networks to overcome the connectivity challenge together with high-level government leaders and representatives, regulators, international organizations and leading industry Chief Executive Officers at the UN Broadband Commission's Special

Session on the sidelines of the Annual Meeting of the World Economic Forum in Davos, Switzerland.

The BBCom/WEF joint session, which brought together the Broadband Commission and the World Economic Forum communities to examine and identify new financing models for societal impact and engage multiple stakeholders in the digital landscape, was held for the 6th time on 21 January 2020 and agreed that efforts are needed to lower the

cost of broadband, as well as innovative policies to finance the rollout of broadband infrastructure to unconnected populations. Collaboration among and contribution by diverse stakeholders were highlighted as key to making universal and meaningful connectivity a reality for all.

The Session included three breakout groups to examine in detail issues concerning (1) Financing for sustainability and social impact, (2) Public Private Partnerships for Sustainability and (3) Inclusive Meaningful Connectivity for a safe digital future, of which the first group was led by Bocar Ba. Participants highlighted that existing financing, funding and investment models no longer support connecting meaningfully the 4.4 billion offline population by 2030, requiring new approaches and solutions to be found. To this end, a new BBCom Working Group to be co-chaired by Bocar Ba of SAMENA Council and Scott Gegenheimer of Zain Group on new 21st Century Financing Models for Sustainable Broadband Development, that will kick-off its work imminently, has been established. This group will study and identify options for consideration to foster innovative funding, financing and investment strategies, which can enable and empower different digital stakeholders to achieve the Commission's targets for broadband connectivity and adoption.

DT One Joins SAMENA Council's Membership to Fortify Its Global Presence as an Innovative Connectivity and VAS Provider

SAMENA Council has announced that DT One, the world's leading B2B mobile airtime and data top-up provider, has joined its membership of top-notch regional and global ICT industry players. Operating in over 160 countries, DT One interconnects in excess of 600 telecom operators, with a digital connectivity customer base of over five billion mobile users. DT One is now a part of SAMENA Council's network of telecom operators, service providers, internet companies, technology manufacturers, and specialist firms which are enabling telecom operators to make the most of their infrastructure investments and fulfil national digital development goals.

Mr. Bocar BA, CEO & Member of the Board of SAMENA Council, congratulating DT One on the decision to become a member of the Council, stated: "We warmly welcome DT One to SAMENA Council's diverse membership of service and technology providers, all of which share common interests and business objectives of the Council, especially with respect to the collective objective of delivering better access to digital communications, worldwide. In DT One, SAMENA Council sees a state-of-the-art partner and a key enabler of digital communications

services, which can substantially contribute to bringing connectivity to the still unconnected. This is an important milestone that must be fulfilled in accordance with the globally agreed Sustainable Development Goals (SDGs). He continued, "SAMENA Council shares DT One's objective of fostering better collaboration with telecom operators as well as with the private sector in general. As such, DT One's participation in the membership affairs of the Council will help create new synergies to help drive better value, improve business prospects, benefit end-users, and meet ICT development goals set forth under national ICT visions around the region."

"DT One is delighted to be part of the SAMENA Council and have a seat at the table with so many respected telecom market players in shaping the future of the industry. We look forward to sharing our knowledge and experience with the Council and adding value to all the members in this ecosystem", says Mr. Thierry Siminger, Chief Commercial Officer of DT One. "We believe that DT One's experience in building a global network for mobile top-up and data solutions, bill payments and rewards as well as integrating with multiple telecoms in vastly diverse markets will

benefit all members of the council".

SAMENA Council believes that — while policies and co-operative approaches can help develop new methods and models of engagement; help frame future-friendly regulations and policies — essentially, it is the involvement of diverse technology providers and innovative service providers that contributes to improved understanding of priorities, needs, and incentives required by the Industry.

The digital ecosystem's sustainability challenges and the need for making better use of digital technologies, therefore, demand that Operators and Technology Providers and Service Providers, such as DT One, collectively communicate on common issues and needs, while supporting SAMENA Council to conduct advocacy exercises and build communication bridges among private-sector entities as well as with regional governments.

About DT One
DT One operates a leading global B2B network for mobile top-up and data solutions, enabling vouchers, bill payments and innovative mobile rewards. We're able to provide greater access to digital communications for over five billion people across emerging economies.

Our global network interconnects more than 1000 telco, digital and financial partners across 160 countries and delivers smarter data-driven mobile solutions to ensure that no one is left unconnected.

Founded in 2005, the DT One team is headquartered in Singapore with regional offices in Dubai, Miami and Prague.

Website: www.dtone.com

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stc

MEMBERS NEWS

stc Group's Revenue for 12 Months Period of 2019 Increased by 4.64%

stc Group announced the company's interim consolidated condensed financial results for the period ending at 31 December 2019:

- Revenues for the 12 months period of 2019 reached SR 54,376m with an increase of 4.64% compared to the corresponding period last year.
- Gross Profit for the 12 months period of 2019 reached SR 32,407m with an increase of 6.35% compared to the corresponding period last year.
- Operating Profit for the 12 months period of 2019 reached SR 12,484m with an increase of 1.95 % compared to the corresponding period last year.
- Earnings before Interest, Taxes, Zakat, Depreciation and Amortization (EBITDA) for the 12 months period of 2019 reached to SR 21,281m with an increase of 7.29% compared to the corresponding period last year.
- Net Profit for the 12 months period of 2019 reached SR 10,755m with a decrease of (0.23%) compared to the corresponding period last year.

In accordance with the approved dividend policy for three years starting from the 4th quarter 2018, which was announced on 16 December 2018, and has been ratified during the Extra Ordinary General Assembly Meeting on April 24th 2019, stc Group will distribute a total of SR 2,000 million in cash dividend for Q4 2019, representing SR 1 per share. The eligibility of dividends shall be for the shareholders registered in the register of the Securities Depositary Center Company (Edaa) at the end of 2nd trading day after the day of the Annual General Assembly Meeting, which will be announced later. Dividend distribution date will be announced later. Commenting on the results, Eng. Nasser bin Sulaiman Al Nasser, stc group CEO, stated that the company's strategy to invest in new and diversified domains along with the excellent performance from all stc's subsidiaries and business unites, supported by the increase in the number of mobile and fiber optics customers and data revenue led to an increase of 4.6% in the company's annual revenue. Also, the cost efficiency program initiatives had a role in increasing earnings before interest, taxes, zakat, depreciation and amortization (EBITDA) by 7.3% for the current year compared to the previous year. In Q4 2019 stc Group launched the new unified brand identity in KSA, Kuwait, Bahrain and its subsidiaries. The new brand is in line with the development witnessed by the group in the field of digital transformation represented in the tracks of digital payments, media, and entertainment, and in harmony with the digital revolution and rapid changes in the communication and information technology sector. The new identity contributes in enhancing stc Group's brand value as one of the most valuable brands in the Middle East in 2019, with a value of 26.6 billion riyals (USD 7.1 billion), according to the Brand Finance Index. In addition, stc Group has been ranked among the world's top 50 digital companies and the first in the Middle East and North Africa in 2019 according to Forbes magazine. In recognition of the group's commitment to continue to lead, stc Group has achieved the highest average mobile internet download speed in the Kingdom (reaching to 45.4 megabyte per second) according to the government report "Meqias" issued by Communications and Information Technology Commission (CITC). This achievement is due to the continuous infrastructure investment, which resulted into the deployment of more than 2300 5G towers during 2019. The newly deployed 5G towers will have a positive impact on internet download speed during the coming period. On the other hand, the company also continue the deployment of fiber optic network in the Kingdom, which comes as part of the National Broadband Network Initiative (NBB) and in line with its commitment towards achieving the digital initiatives of the Kingdom's 2030 vision. As a result, the number of fiber optic (FTTH) customers increased by 23% in 2019 compared to the last year, thanks to the vast fiber optics network that has reached 217,000 Km by the end of 2019.

Labor Ministry Partners with stc Group for Digital Transformation

The Ministry of Labor and Social Development and the stc Group have signed an MoU for strategic partnership in several areas and benefit from each other's experiences to achieve their respective goals, which are in line with the Kingdom's Vision 2030. The MoU was signed by Rashid bin Muhammad Al-Jalajel, undersecretary for strategic affairs, Ministry of Labor and Social Development, and Riyadh bin Saeed Muawad, senior vice

president of the business unit, stc Group. The signing took place in the presence of Minister of Labor and Social Development Ahmed bin Sulaiman Al-Rajhi, CEO of stc Group Nasser Sulaiman Al-Nasser, and Assistant Minister of Labor and Social Development Mohammed bin Nasser Al-Jasser. The deal aims at enabling digital transformation, training and qualifying employees at the ministry, providing data and internet solutions and services at high

speed in accordance with international standards, as well as wired and wireless phone lines and IP telephony services, in addition to the development of fast, effective and high-quality communication and coordination tools for VIPs through technical support mechanisms and rapid response to malfunctions. Al-Jasser, assistant minister of labor and social development, said: "This agreement is in line with the Kingdom's Vision 2030 and supports communication channels between government agencies on the one hand and between the citizen and the private sector on the other hand." He said the MoU aims to achieve social economic development and contribute to the national economic policy. Meanwhile, Muawad, senior vice president of the business unit, Stc Group, said the company's innovative technical solutions aim at enabling all sectors of the Kingdom to digitize their services as digital transformation is one of the key pillars of Vision 2030, through which it seeks to raise the quality of services provided to citizens. "We are proud to be part of this huge project that will benefit the country, and will achieve the goals of the leadership by localizing businesses in different fields," he added.

Alhakbani Appointed CEO at "TAWAL" - a Subsidiary of the stc Group

TAWAL's Board of Directors announces the appointment of Eng. Mohammed bin Abdulaziz Alhakbani as Chief Executive Officer from January 12, 2020. Stating on this, "Mr. Amin bin Fahad Al-Shadi, Chairman of the Board of Directors of "TAWAL" Company, which is a subsidiary of stc Group, as he expressed his confidence in the appointment of Engineer Muhammad Al-Haqbani as to his managerial and professional experience in the telecommunications and information technology sector. Saying: "He is one of the chief experts in the field, and confident that he will reinforce the company's role in providing integrated ICT infrastructure. We wish him every success in enhancing the company's performance to the highest levels to achieve the company goals in supporting the desired digital transformation in the Kingdom, according to the National

Transformation Program 2020, and the kingdom's Vision 2030". Eng. Mohammed Alhakbani as well expressed his deep appreciation to all members of the Board of Directors at TAWAL for their confidence and support to strengthen the company's pioneering position and to provide the latest infrastructure services and solutions for the information and communication technology sector within the Kingdom and the region. Engineer Alhakbani holds a Bachelor's degree in Electrical Engineering and a Master's degree in Computer Engineering. He has more than 20 years of experience in the telecommunications field. Eng. Mohammed has previously worked in many positions at stc Group. He started in 2003 as a Planning Engineer for the broadband network. After that in 2007, he moved abroad to work as a Project Manager responsible to launch stc Group's

subsidiary mobile network in Indonesia. In mid-2011, Eng. Alhakbani promoted to General Manager of Network Services and Solutions. Moreover, in 2015, he joined the Enterprise unit in stc Group as VP of Business Operations and then after VP of

Enterprise Accounts sales, managing the sales team that offers telecom and ICT services to the Enterprise and SME segment. TAWAL "one of stc Group subsidiary" is a specialist Saudi ICT Infrastructure Company that offers state-of-the-art ICT infrastructure solutions to supply a growing industry. TAWAL, well positioned to lead the next hi-tech transformation by offering the ideal answer to customers in search of a reliable and cost-efficient ICT infrastructure that would ensure optimal operations for their business. Currently, a key player in the Saudi telecommunications infrastructure industry.

Batelco Expands Its Cloud Connect Solutions by Introducing Google Cloud Interconnect

Batelco, the leading digital solutions provider in the Kingdom has expanded its cloud connect solutions portfolio with the introduction of Google Cloud Interconnect. The development strengthens Batelco's cloud services which also includes AWS Direct Connect and Microsoft Express Route and boosts the Company's global connectivity solutions by offering a secure, reliable and resilient network. Among the benefits of the cloud solutions are reduced network costs, increased bandwidth throughput, and a more consistent network experience than Internet-based connections, enabling Batelco's customers to enjoy a consistent and best in class performance. Google Cloud Interconnect is a dedicated interconnect and provides users with direct physical connections between their on-premises network and Google's network, allowing the transfer of large amounts of data and resulting in cost efficiency as it does not require the purchase of additional bandwidth over the public internet. Additional benefits to Google Cloud Interconnect, which has become the 'go-to' solution to connect premises data centers to Google Cloud, include low latency and highly available connections, enabling users to reliably transfer data between their on-premises and Virtual Private Cloud networks. Commenting on the new solution launch, Chief Global Business Officer Adel Al-Daylami said, "As a result of this new offering, customers can be confident that they are utilizing highly secure connections, as traffic passes through a service provider with a dedicated connection, enabling our customers to enjoy a private, secure, and high-performance connection to multiple cloud platforms. Customers are also able to scale their connection capacity to meet their particular requirements, helping them to achieve their business requirements and support their digital transformation." Batelco is focused on providing the latest communications technologies and expanding its cloud connect portfolio to meet the growing demand for digital solutions. As part of its efforts, Batelco is continuously building the eco-system for future digital needs, with the launch of Global Zone early in 2019, an important step. Batelco's plans are in line with the Kingdom's plans for improving the national communication infrastructure and in support of the growth of the digital economy and its required ecosystem.

Etisalat Remains the Most Valuable Consumer Brand in MEA for the 3rd Consecutive Year

Etisalat set another milestone by coming out on top again as 'The Most Valuable Consumer Brand' and 'The Most Valuable Telecom Brand' in Middle East and Africa (MEA) by Brand Finance as a recognition for the success and growth of the brand spurred by digital customer service driven strategy and engaging with consumers across markets with innovative global branding initiatives. Based on the report from Brand Finance, world's leading independent brand valuation and strategy consultancy, Etisalat boasts of an impressive portfolio of brands touching $11bn including Etisalat Misr, Mobily, Ufone, Maroc Telecom and PTCL. The brand has also demonstrated consistent performance over the years retaining its title as the most valuable telecom brand for the fourth year in a row. The brand value increased to $8.5 bn as the most valuable consumer brand in MEA for a third consecutive year on a standalone basis. Etisalat is also the only telecom brand to retain AAA brand rating. David Haigh, CEO, Brand Finance said: "Etisalat is the most consistent performer in the Middle East & Africa and the winner of the most valuable consumer brand title in our Global 500 for a 3rd year running. It is amongst the most innovative players globally with its portfolio of brands approaching a brand value of $11 billion. Etisalat has a whole new set of digital solutions coming through which are presented during GITEX every year and its fast roll out of 5G, set to become the backbone of the Expo 2020 showcase when it kicks off in October." Eng. Saleh Abdullah Al Abdooli, CEO, Etisalat Group said: "Reaching the top is hard but maintaining a leadership position is harder. With the regional leadership of Etisalat as a brand it is a testimony to our continuous efforts in digital transformation amplifying our efforts in the societies we

serve by investing in new digital platforms, 5G technologies and global brand building initiatives. "Inspired by our ambitious and digitally fueled vision 'Driving the digital future to empower societies' Etisalat has taken the lead in the launch of 5G in MENA opening a world of opportunities and spurring innovation in the government and industries providing a platform to enable future technologies to become an integral part of our economy and lifestyle. This achievement also reinforces the synergy of operating companies across our footprint, creating brand loyalty and enhanced engagement with our customers. Thanks to the UAE leadership's support, vision and encouragement that helped Etisalat achieve this significant

milestone surpassing some of the top renowned regional brands." Etisalat as a brand has played a growing role in fulfilling the UAE's National Innovation Strategy and its dominant influence in shaping the region's digital future are behind its continued success. Operating in 16 countries with 148 million subscribers across Asia, Middle East and Africa, Etisalat's success can also be attributed to its continued efforts in developing its customer loyalty programmes, sports sponsorship commitments and in driving the digital future to empower societies. Etisalat pioneering 5G efforts in the region and delivering one of the fastest, smartest and best-connected places on earth during the global mega Expo 2020

Dubai has attributed to its success as a brand in the region. As the premier digital services and telecommunications partner of Expo 2020 Dubai, Etisalat is prepared to deliver the event's visitors and delegates 5G connectivity that brings the Expo themes to life for the 25 million expected visitors. Several factors have attributed to the success and growth of Etisalat's brand value mainly driven by an innovative customer service strategy, adapting well to a digital savvy marketplace, leading the 5G revolution and the successful launch of global brand building initiatives. Etisalat has also led digital innovation in the country by working on several digital initiatives in infrastructure, entertainment and smart cities. Etisalat has reached out and engaged with its consumers across markets with global branding initiatives by sponsoring global football teams and clubs aligning with the brand's priorities of being at the forefront of major sporting events. Etisalat also launched the new positioning campaign 'Together Matters' to highlight togetherness among its subscribers in today's world of connectivity. Brand Finance, is the world's leading independent branded business valuation and strategy consultancy, and is the organisation behind the Global 500 Brands and Telecom 300 league table of the world's biggest brands ranked by their brand value, assesses the dollar value of the reputation, image and intellectual property of the brand.

Etisalat Launches First OpenRAN Network in MENA Region

Etisalat has announced the successful launch of open virtual Radio Access Network (Open vRAN), becoming the first operator in MENA to achieve this technological feat. By supporting Open architecture, Open vRAN technology accelerates the delivery of mobile networks. The technology is the foundation of next-generation wireless infrastructure driven by innovation and open standards. Today's announcement demonstrates Etisalat's strong commitment to sustaining its technological leadership, by bringing in such technological advances. Etisalat has become one of the first operators worldwide to launch this technology. The success of this deployment by Etisalat was possible with the collaboration of Etisalat partners Altiostar, NEC, Cisco and other leading

vRAN technology vendors. The solution combines scalability enhancement and virtual networks achieved by integrating equipment from various vendors. Using commercial off the shelf (COTS) hardware from third parties, Etisalat is transforming the hardware network to a software-based one. The vRAN architecture approach decouples the programmable RAN software elements from the hardware, allowing generally available hardware (generic pre-processer) and server platforms to process the RAN software. This results in deployment flexibility, scalability, agility, energy efficient networks through reducing hardware elements on the network. Open vRAN approach reduces time to market, as it is quicker to deploy mobile networks than traditional deployment

methods. Additionally, network capacity augmentation and optimization is enhanced by the simplification of nodes and enabling new automated methods and AI algorithms. Saeed Al Zarouni, Senior Vice President, Mobile Network at Etisalat, said: "Keeping in line with Etisalat's strategy of 'Driving the digital future to empower societies', deploying the Open vRAN is vital in enabling digital transformation aimed at increasing efficiencies and the utilization of AI. Today's announcement is aligned with UAE's objectives of achieving digital transformation with the deployment of best-in-class technologies. Etisalat now plans to roll out Open vRAN across the UAE to take full advantage of all the benefits that this new technology offers."

Etisalat Highlights Impact of 5G Technologies on the Future of Media

The media plays an increasingly significant role in our lives as a trusted source for news and information, and beyond that also a source for entertainment. It is also a powerful communications platform for the society with the ability to influence people's opinions and perceptions therefore making a significant social impact at all levels, highlighted Dr Ahmed bin Ali, Group Senior Vice President, Corporate Communications, Etisalat. His presentation was part of Etisalat's participation in the meeting of the Secretariat General of the Arab League - the 15th meeting of the Arab Digital Media Committee – from 12th -13th January held at the Dubai Press Club headquarters organized by Watani Al Emarat Foundation. Dr. Bin Ali said the media industry has undergone drastic transformation in recent years, and mainly due to the major technology advancements the world has witnessed. He went on to highlight the advances in technology and how it has facilitated the growth of the media sector. The investments in 5G networks will play a significant role making a positive impact on media and journalism. 5G has superior capabilities with high speeds and ultra-low latency. Live feed news coverage for reporters in the field specifically for breaking news and multi-location interviews for the TV industry were cited as examples for the future of media on the 5G network. The high data download/upload speeds will benefit all journalists, particularly investigative reporters. These advanced

capabilities will also be of immense benefit in media coverage of major popular events, especially large-scale ones such as the upcoming Dubai Expo 2020. This will enhance the broadcasting capabilities for external coverage mobile media hubs, create futuristic media platforms, and augment the services of content providers. High speeds and low latencies would also boost the quality of the media's interaction with its audiences. 5G technology will make hologram reporters a reality; people in the future would go beyond than virtual reality being able to experience the news event through advanced immersive experiences technology. Currently globally there are 5 billion smart phone users with the number projected to surpass 7.2 billion within the

coming 5 years or less. 5G data usage will comprise of 25 percent of the total global data transfer share. Video and immersive experiences will form the core of future 5G network capabilities giving users near life-like experiences with maximized levels of 2-way interactions. 5G networks will have a significant and positive outcome for the media and entertainment industry. There will be a transformation for fixed networks, elevating financial returns, create new revenue streams from advertising and content and have a wider outreach. He concluded his talk by pointing out that it is imperative that we have media entities ready and willing to adopt these new technologies in order to ensure its leading regional and global status.

Etisalat Launches UAE's First Business Unified Communication Service 'CloudTalk'

Etisalat announced the launch of a first-of-a-kind cloud-based business unified communication and collaboration service for small and medium businesses (SMB) and enterprise customers in the UAE. Etisalat has partnered with Ribbon Communications to provide customers with a secure, scalable, and cloud-native business communication and collaboration solution. Etisalat's CloudTalk offers customers an integrated communication solution for their

internal and external communication and collaboration needs. The service is delivered over a carrier-grade cloud private branch exchange (PBX) replacing the legacy setups. Transformation is rapid and performance is optimum with minimal time needed for deployment. The pay-as-you-grow model gives customers the flexibility to work in multi-channel communication environments, minimizing upfront investments and focusing on productivity rather than infrastructure.

The hassle-free solution gives users the ease of switching between various devices seamlessly in real-time from any location. The state-of-the-art features such as instant messaging, video conferencing, screen sharing and mobile app, among others, contribute to an elevated user experience leading to better productivity. Salvador Anglada, Group Chief Business Officer, Etisalat, said: "We are delighted to launch CloudTalk along with our partner Ribbon Communications. The agile, secure,

and cloud-based solution will be beneficial for businesses looking to simplify their complex communication infrastructure. The launch of this unique platform enables Etisalat to be a single provider for cloud telephony, offering comprehensive tools at a viable price. We at Etisalat are committed to delivering innovative technology blended with superior service levels that help businesses embark on their digital journey." Patrick Joggerst, Chief Marketing Officer and Executive Vice President, Business Development of Ribbon Communications, said: "Our cloud- native solutions help enable the intelligent and secure real-time communications solutions today's businesses are embracing. We are proud to support this ambitious new undertaking as Etisalat continues to showcase its leadership position in digital transformation."

Omantel Collaborates with Siemens to Bring Smart Digital Solutions in Healthcare

In yet another path-breaking step towards harnessing ICT to improve people's lives, Omantel, the frontrunner in telecommunications and ICT in the Sultanate, has joined hands with Siemens to bring smart solutions (smart hospitals) to the country's healthcare sector. Omantel aims to use its expansive state-of-the-art ICT infrastructure to bring advanced solutions to healthcare practitioners and provide better outcomes for the patients. Siemens, a robust name in infrastructure digitalization among many other specialties, showcased the advanced capabilities of eHealth & Smart City Solutions at Omantel's 3rd Annual ICT Summit which took place in November. Commenting on the partnership, Eng. Baha Allawati, VP of Omantel's Enterprise Unit said, "At Omantel, we always keep the people at the heart of our plans toward achieving a digitally enriched society. Healthcare is a growing critical sector with a host of advanced technologies being introduced to benefit patients and healthcare institutions alike. we continue to boast various state-of-the-art technologies in telecommunications, digital transformation, IT, innovative services and smart solutions, and it was only natural that these assets be optimally utilized to further strengthen the health sector with such solutions. As such, we are pleased to partner with Siemens, a global leader in providing tailored ICT solutions for the healthcare sector". On her part, Claudia Vergueiro Massei, CEO of Siemens Oman said, "The demand for healthcare services is growing. Patients have ever-increasing expectations about the quality of healthcare treatments and services. Not only that, researches show that the building environment can impact the healing process – comfortable spaces help patients recover faster and allows the staff to work more efficiently. Our digital solutions allow us to revolutionize hospitals on the human, financial and operational levels. We are therefore pleased with the opportunity provided to us with this important partnership with the leading telecom operator in the Sultanate to support its citizens and residents to have access today to the patient care of tomorrow" Furthermore, continuing Omantel's strategic direction towards the Sultanate's digital transformation, the tie-up stands to hugely benefit the public and private healthcare sectors as it opens the doors to host of revolutionizing solutions aimed at enhancing productivity, boosting efficiently and flexibility, transparency, compliance, safety and security. To achieve these goals under the defined scope, the partnership will work together using four broad cases: improved patient outcomes through circadian lighting, improved staff productivity through patient tracking and asset tracking and quicker information on emergencies. Circadian lighting regulates activity patterns of the brain in humans as per natural light available in the 24-hour pattern. Simulating circadian lighting in healthcare has shown proven results with improved patient performance to treatment, health and safety. A tracking system will help monitor the patient in and out of the healthcare facility, and will be able to inform/warn health institutions about emergencies, if any. Asset tracking systems, meanwhile, is a digital way to track inventory across departments in hospitals and clinics and reduce costs due to loss, damage, and theft. These systems improve the inventory management processes, thus saving precious time and enhancing staff productivity. With these introductions, Omantel will be successfully integrating ICT with public service through healthcare in Oman.

Telecom Egypt's Board of Directors Approved the Budget for the Fiscal Year 2020

Adel Hamed, Managing Director and Chief Executive Officer, commented: "Telecom Egypt's budget for 2020 reflects our strategy to position the company at the forefront of the ICT market and transform Egypt into a regional digital hub. To accomplish this, we will continue to invest in infrastructure expansions and contribute to significant national projects to seize all opportunities in the market. We will also build on our strong retail performance by preserving our growth momentum, especially in data services. During 2019, we led the shift of the Egyptian fixed broadband market with the launch of 'WE SPACE' and complemented our retail portfolio by introducing our digital wallet, 'WE Pay'. In 2020, we expect to kick-off a number of projects, which will allow us to capitalize on 2019's growth and continue to monetize our investments. In terms of wholesale growth, the growth of our domestic and international businesses is expected to be driven by the mounting demand for infrastructure services by MNOs and ISPs and higher cable projects revenues. This year marks the dedicated focus on customer experience and quality of service as we direct our spending towards systems and digital transformation within the organization. With that Telecom Egypt would have completed its elevated and expedited Capex spending cycle and hence its priorities will be focused on managing its cash flows in light of this remaining Capex outlay and the higher interest costs associated with the higher leverage. This is a challenge that we are planning to mitigate by setting relaxed payment terms with vendors, extracting synergies from existing assets and extracting cost efficiencies."

Zain Drone: First Drone Services Provider in Region to Receive ISO 9001:2015 Certification for Quality Management System

Zain Group, the leading mobile telecom innovator in eight markets across the Middle East and Africa, announces that its Zain Drone subsidiary has received ISO 9001:2015 Certification with respect to its Quality Management System (QMS). This significant achievement makes Zain Drone the first drone services provider in the region to receive the internationally recognized accreditation. ISO 9001 specifies requirements for a QMS standard reached by organizations to demonstrate the ability to consistently provide services that meet customer and regulatory requirements, and to create operational efficiencies by aligning and streamlining processes throughout the organization. Zain Drone's certification offers assurances for external parties that the company follows a process-oriented approach for their service delivery standards, risk assessment approaches, and the procedures required to achieve its effective quality management in the organization. The internationally recognized standard helps organizations in implementing a customer-focused approach and an on-going process improvement to achieve efficiency among other benefits.
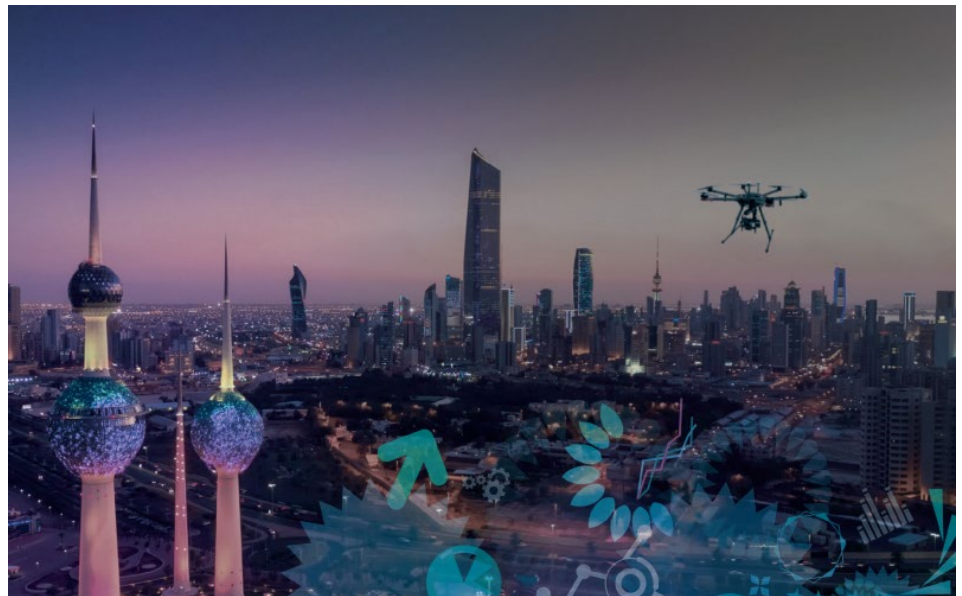
Commenting further on the development, Zain Drone CEO, AbdulAziz Jawad said, "Our ISO 9001:2015 certification is the next step in the company establishing itself as the leading Drone-as-a-Service provider in the Middle East region. The certification makes it clear to stakeholders that we are attentive to our quality management, and to international stakeholders it provides a benchmark of the level of customer-focused approach we need to maintain to be able to lead in this field." Zain Group first announced the launch of its pioneering Zain Drone service in Kuwait in October 2018, with the plan to expand its operation to other markets across its footprint in due course. Since then, Zain Drone has announced several strategic partnership and commercial agreements. Drone as-a-Service (DaaS) unlocks opportunities

in various industries to fast-track growth and help organizations benefit from the Internet of Things (IoT) in an efficient, safer and faster way. The disruptive power of drone solutions bolsters efficiency as it offers state-of-the art bespoke solutions while providing advanced analytics for governments and businesses. Among other offerings, Zain Drone facilitates the gathering of image data concerning work advancement through measurement of key parameters, assessing image data to evaluate compliance with original designs and performing automated stock-taking.

Furthermore, Zain Drone supports the growing demand to replace physical inspections with digital inspections, reducing physical inspection hours, costs, manual labor, human error and shut-down time for operators.

Accenture Invests in and Forms Strategic Alliance with TradeIX to Help Digitize Global Trade

Accenture has invested in and formed a strategic alliance with TradeIX, a Dublin-based company whose open platform uses distributed ledger technology to facilitate the flow of goods, services, transactions and information within a secure environment for global trade. Terms of the equity investment were not disclosed. Current trade relies on time-consuming manual transaction processes that can be costly and hard to reconcile. Distributed ledger technology enables new ways to share data and the full automation of finance and accounting processes, increasing productivity and working capital while reducing overall risk for banking parties. "Building on TradeIX's solid foundation across the banking community, this relationship will help companies unlock trapped value in data silos across key operational processes, such as finance, accounting and supply chain," said Melanie Cutlan, managing director of blockchain services for Accenture Operations. "Our goal is to scale this capability to help organizations achieve touchless payable and receivable processes within a secure and trusted environment — ultimately transforming how they conduct business with each other." As part of the agreement, Accenture will work with TradeIX to bring to market new use cases, beyond banking, to address the needs of buyers and sellers within trade finance. TradeIX is the latest addition to the investment portfolio of Accenture Ventures, which teams with and invests in companies that create or apply innovative enterprise technologies. Robert Barnes, CEO and co-founder of TradeIX, said, "With our global footprint expanding exponentially across both banks and their corporate clients, this alliance with Accenture is instrumental in us achieving our ambitions in making trade more transparent, smarter and better connected internationally." The companies will work together to develop touchless finance processes, such as procure-to-pay and order-to-cash. This initiative will further expand the Marco Polo Network—a joint undertaking of over 30 leading banks, corporations and technology providers enabling simple, secured sharing of trade-related data between financial institutions and their corporate clients — to include buyers, suppliers, logistics and other entities. Accenture will also serve as a preferred implementation partner for the Marco Polo Platform. The World Economic Forum estimates that applying blockchain, could result in more than US$1 trillion of new trade in the next decade.

BBC News Arabic Launches Now in HD Exclusively on Arabsat

A good start on the new year 2020 for MENA region viewers who can enjoy their favorite BBC News Arabic channel now in HD, available exclusively for viewers on Arabsat Badr-4 satellites at the hotspot 26ºE. BBC News Arabic television has

inked another long-term agreement with Arabsat to launch exclusively their first Arabic news channel in high resolution to the region, onboard of Arabsat BADR-4 which covers the entire MENA region and most of Western Europe. Starting January 1st, 2020, the HDTV FTA channel will join the same video neighborhood with her sister channel BBC News Arabic SD, and among other leading international and regional news channels, which can be received across the region with the minimum receive dish size. Sam Farah, Head of BBC News Arabic said: "I am very pleased BBC audiences can now watch BBC News Arabic TV in high resolution across the Middle East, and elsewhere in Europe. It's never been more important for people to be able to turn to trusted,

independent news providers, and it is very exciting that our audience can now tune into BBC News Arabic's award-winning journalism in HD quality." Khalid Balkheyour, Arabsat President and CEO said: "This new agreement with BBC News Arabic will enrich the audiences experience in MENA region, and matches Arabsat strategy to continue being the leading HD neighborhood for Middle East & North Africa. BBC News Arabic is one of the pioneer channels to broadcast in Arabic language and we are delighted to be the first choice every time the channel wants to increase its presence across the region. Exclusively broadcasting in HD format, is something unique and significant to this strategic partnership".

AT&T on Target for Virtualizing 75% of Its Network by 2020

Consider 2019 a lag putt for AT&T's stated goal of having 75% of its network virtualized by 2020, but the telco plans to drain the remaining short putt by year's end. After virtualizing more than 55% of its network functions in 2018, AT&T's goal was to hit 65% in 2019, which it did early last year. "We aim to control 75% of our core network functions with software by the end of 2020, and by reaching 65% at the end of 2019, we're nearly there," said Scott Mair, president of AT&T technology and operations, in a blog post. "Today, 100% of the data traffic that runs through the infrastructure connecting the elements of our core network together is backed by SDN." An AT&T spokesman said that while the telco hit its 65% goal in early 2019, the number is actually higher now, but AT&T isn't ready to disclose the new figure. AT&T first outlined its virtualization project back in 2013 as part of its Domain 2.0 initiative.

The following year it announced its goal for having 75% of its core network functions virtualized by 2020. The plan included using its internally developed ECOMP, which is now part of ONAP, and software-defined networking (SDN) to virtualize and put into production critical network functions. Amy Wheelus, AT&T's vice president of cloud and Domain 2.0 Platform integration, said in an interview with FierceTelecom last year that the telco had learned a lot over the previous three years in regard to designing VNFs (virtual network functions) to work better in a cloud-like environment, but the virtualization tasks became harder as AT&T got closer to its goal because the remaining elements were more difficult to virtualize. AT&T has started to reap operational savings from its move to software-defined networking. The embrace of SDN has also enabled AT&T to roll out new customer-facing offerings

with features that weren't available on its legacy services. For example, Flexware allows AT&T's customers to use VNFs to provide intelligent edge capabilities in a SDN/NFV environment on a flexible universal CPE device. "It is now much more mature—in areas wider, such as consumer, business, and mobility business areas, and deeper, including SKUs of similar VNFs in different parts of the network across switches, routers and applications with more automation in place," said Chris Rice, senior vice president of AT&T Labs, Domain 2.0 Architecture and Design, in an interview last year when asked about AT&T's virtualization effort. "For 5G, for instance, that service will be 'born in the cloud.' We are fortunate to have three years of SDN/NFV experience to apply to our 5G network build."

AT&T Looks to Fiber for Revenue Growth

AT&T's recent fiber build-out may have been driven by a deal the company made with the federal government, but now management expects AT&T Fiber to be a solid contributor to revenue growth. "I think we'll see higher IP broadband, fiber-based broadband revenues," AT&T CFO John Stephens told investors at the Citi 2020 conference this week. Wall Street is paying close attention to AT&T's comments about revenue, since the company has projected anemic revenue growth in the coming years, and some analysts think that even these modest forecasts are probably unachievable. Stephens also highlighted the synergies his company expects to realize by offering entertainment packages to customers whose homes are served by AT&T Fiber. The company is banking on its planned May launch of HBO Max to boost subscriber numbers and revenues for its entertainment group. Stephens said AT&T's fiber-to-the-home customers "will be able to bundle HBO Max and any other streaming services that someone might have." His remarks echoed those made late last year by John Stankey, AT&T president, COO and CEO of Warner Media, at the UBS Global TMT Conference. "We -- there's no reason why -- where we've deployed fiber that we can't be an equal share player to our competitor there," Stankey said. "We have a lot of room to grow there, and we're going to ride that aggressively and get the benefit out of that extensive investment we've made." Last year, AT&T surpassed the 12.5 million customer locations that the FCC required it to serve with fiber as a condition of the company's DirecTV acquisition. AT&T Fiber now passes more than 14 million locations, and Stephens said this week that he foresees "great joint utilization between not only broadband-to-the-home, but also network backbone for our wireless network." AT&T is working hard to make sure that growth in fiber-to-the-home is not offset by declines in its business wireline unit. The company's legacy voice and data business has been in decline, but much of that decline has been offset by growth in strategic and managed services for business wireline customers. Strategic and managed services revenue was $11.5 billion for the first nine months of 2019, versus just under $7.0 billion for legacy voice and data services. "Over 60% of our revenue on business wireline as strategic services is next-generation," Stephens said. "So, we're getting through that maturity process. We're getting through that transformation process pretty well and holding on to margins. And so as that continues to grow, we'll continue to be healthier and healthier." Part of that growth, however, is likely to be a shift in the asset mix. AT&T is currently undertaking a comprehensive review of its assets and businesses under the direction of Bill Morrow, former CEO of Clearwire and Australia's National Broadband Network. Last year, Stankey predicted that the wireline business would be targeted for "rationalization." "When you think about product rationalization in the wireline business that means geographic and footprint rationalization, and there's a huge opportunity for us to look at our wireline business and how our customers are laid out and start thinking about what we do to take out layers of cost based on geography we serve and products that we support that maybe have run their course in a fairly mature business moving forward," Stankey said, adding that labor was "clearly an important part" of the rationalization picture. AT&T already announced plans to cut hundreds of jobs after it met the requirements set by the FCC for its fiber build-out. The Communication Workers of America said notifications of the job cuts, expected to total about 1,800, took place last summer.

Arjun A. Sethi Named Kearney's New Head of Asia Pacific

Kearney, a leading global management consulting firm, has named Arjun A. Sethi as the Regional Chair (elect) & new Head of Asia Pacific effective May 1, 2020. Arjun will oversee the business strategy and operations of Kearney's business across Australia and New Zealand, Greater China, India, Japan and Southeast Asia. "Our Asia Pacific practice has been vibrant in recent years—and the source of some our most significant and innovative transformation assignments as a firm," said Alex Liu, Managing Partner and Chairman at Kearney. "Arjun's leadership and expertise in the global digital and analytics space will accelerate the significant client expansion we envision across the entire region." Arjun will succeed Saurine Doshi, who has served in the position for six years and will rotate into a new role leading the firm's global services and innovation practices. Over the past six years, Kearney has made significant

strides in Asia Pacific, growing its business in every market and cementing its place as the leading strategic operations and transformation partner in the region. Arjun's appointment marks his return to Asia where he started his consulting career in March 2000 as a consultant in Kearney's New Delhi office. In 2005, Arjun moved to New York where he made partner and later appointed as the Global and Americas Lead for the Digital Transformation Practice. "I am excited to take on this role leading our business in such a diverse and dynamic region," Arjun said. "Asia is the engine room for the global economy and this new decade will present even more change and opportunities for growth for our clients in the region and worldwide. Kearney brings a unique mix of expertise and empathy to help companies navigate this evolving business environment". Arjun earned an MBA from the Indian Institute of Management in Calcutta and a bachelor's in engineering from Motilal Nehru National Institute of Technology in Allahabad, India. He was selected as one of the top 25 consultants globally by consulting magazine for "excellence in leadership," and for the work he has done establishing and growing Kearney's Digital Transformation Practice, the firm's digital experience labs, and its vibrant ecosystem of alliance partners in digital. Arjun has begun transitioning into the regional role effective January 1, 2020. He is a member of Kearney's Operating Committee and will maintain his role as Vice Chair of the Digital Transformation Practice.

BCG Advances to Top Position in ALM Intelligence Ranking

ALM Intelligence has named Boston Consulting Group (BCG) the number one firm in organization strategy consulting worldwide. The latest edition of The ALM Vanguard of Organization Strategy Consultants, which ranks the world's major consultancies in terms of their ability to create client impact, has ranked BCG number one across all three dimensions considered: depth of capabilities, breadth of capabilities, and client impact. The top-ranked tier of consultancies in the study—the ALM Vanguard leaders—are at the pinnacle of the market in terms of their ability to create client impact through their depth and breadth of expertise and deploy that expertise across a range of engagement models. BCG earned the best composite performance ranking of the 29 firms featured in the study. It won the highest rating ("very strong") in four of the nine provider capabilities (external market insight, strategy, management system, and enabling tools) and the next-highest rating ("strong") in the remaining five categories (needs assessment, internal client insight, operating system, project management, and client capability development). The firm improved its leading position of the past two years, notes ALM, as a result of "superior utilization of ecosystem capabilities and strategic partnerships that extend [BCG's] breadth of analytics and implementation capabilities." In addition, BCG "continued to innovate diverse approaches to organization design." Adds ALM, "the firm's research on organization strategy fuels this market-centric innovation capability at the same time as it ensures client services are on the leading edge of trends in the space."

New Org Design Approaches Bring Strategic Value

These new approaches, under the heading Org Design 3.0, "apply the theoretical foundations of Smart Simplicity to meet clients' evolving needs for becoming more agile, digital, purpose-driven, and zero-based (i.e., cost effective)." "Being able to take a fresh, deeper, and more comprehensive approach to organization design creates powerful opportunities to change the trajectory of a business and boost performance," notes Andrew Toma, a senior partner and global leader of organization design and support functions at BCG. "This new way of looking at organization redesign is especially helpful for executives who are faced with intensifying competition, evolving business models, and complex technologies." Smart Simplicity is a set of principles designed to reduce complexity and shape behaviors by making people more autonomous and collaborative problem-solvers. BCG has enhanced its approach to Smart Simplicity through its Org Design 3.0 approach, built on the foundation of Org Design 2.0. This new approach is highly programmable to unique client needs using a comprehensive set of tools for changing structures, roles, and ways of working, as well as building leadership and culture.

Best-in-Class Again for Enabling Tools

BCG was also chosen "best-in-class" in the category "enabling tools" for the second year running. The choice was based on the strength of BCG's proprietary tools that underpin its organization strategy consulting methodologies. According to ALM, "BCG further stands out for its ability to connect the products, services, and capabilities of the firm's broader ecosystem in a people- and organization-focused ecosystem that leverages data and emerging technologies to implement large-scale organization strategies." As Kevin Kelley, a BCG partner and software and data product leader for the firm's People & Organization practice, points out, "The scope of reorganization has grown, and developing structure and talent solutions and implementing the associated reorganizations have become more complex. Driving change at scale requires a broader and deeper reorganization than ever before. The right organizational design and data management tools and capabilities are therefore critical for avoiding common pitfalls and ensuring that firms achieve their objectives in these difficult projects."

BT Partners with Government's Shared Rural Network Program

Joint investment in rural coverage is imperative, but prior investments must be respected – and future investment protected. We're delighted to be part of the Government's Shared Rural Network program, and it's great to see the progress being made to plug the coverage gaps across the UK. The first part of SRN is focused on filling in the so-called 'partial not spots' – places where customers of some but not all operators have 4G coverage. Delivering great 4G coverage wherever our customers live, work and travel has been our key driver when investing in building our UK-leading mobile network since we launched 4G in 2012. But UK consumers should not have to experience 'no service' when they're in an area where mobile sites have been built. This is the basis of the SRN, and participation of all providers is both progressive and vital. Sharing sites should be straightforward, deliver a huge benefit to rural locations and, crucially, minimize the need to add more towers and masts. Over the past seven-and-a-bit years, EE has invested in getting 4G coverage to significantly more places than any other network, driven by our belief that our customers should be able to connect wherever they go. This has meant we've built more sites than any other operator. And, as Ofcom's recent Connected Nations report demonstrates, there's many places where we're the only provider of 4G coverage. We expect many of these sites to form the basis of the share program, helping the other providers to fill holes in their networks to keep people connected. This week, we've submitted an important document into the final part of the process – the cost proposal for sharing sites. This document clearly outlines the reciprocal costs we feel should be paid to get access to one another's sites. It's based upon the inherent value of these mobile sites today, and the investment made to get that site up, built and working – as well as the time and effort to get planning permission and reach agreement with the landowners – to create the mobile coverage these areas so desperately need. All of which is harder to do, and more expensive, because of the challenges of building in rural areas. We think it's fair and reasonable that this investment and the current value of the site are both taken into account, and need to be recognized when others come to 'share' it. Of course, this goes both ways and should ensure that the fair approach to rural coverage that the SRN was designed to introduce is maintained. Finding an analogy here is tricky because this is complex, but I sometimes think of it like Sainsbury's building a new superstore in a rural area and being made to give away shelf space to Tesco, Lidl and Asda. The new Government aims to complete the Shared Rural Network deal within its first 100 days. This is pacy, but we now feel all enablers are there. The £1bn program, to be funded broadly 50:50 by industry and government, will be of huge importance to people across rural parts of the UK – not only in filling partial not spots, as we've discussed here, but also working together to build brand new sites that cover total not spots. We now want to finalize the program as quickly as possible and get on with the important part: improving connectivity for people across the UK, and helping close the digital divide.
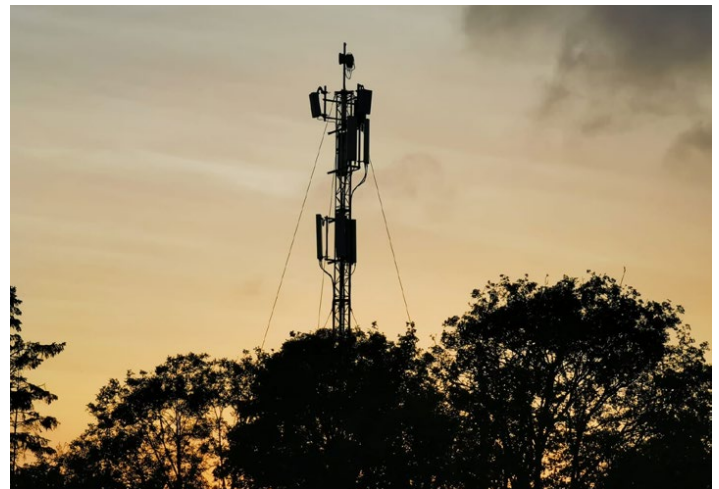
Cisco Releases the 2019 Digital Readiness Index Measuring the Digital Readiness of 141 Countries

Cisco announced the release of its 2019 Global Digital Readiness Index, research measuring the digital readiness of 141 countries across seven components. This research helps us to uncover key insights and build our understanding of what it means for a country to be digitally ready and the positive impact the digital economy can provide. It also outlines possible opportunities to advance readiness. "Technology has the potential to be the single greatest catalyst for economic and social progress," said Tae Yoo, senior vice president of Corporate Affairs at Cisco. "In every corner of the world, digital technology is helping us become more connected to each other and the organizations upon which we rely. It opens markets, creates jobs, and better connects citizens and customers. Our hope is that through Cisco's Global Digital Readiness Index, we can partner with private and public sectors to evaluate how investments in the basic underpinnings of a digital society can serve to raise the quality of life for all citizens around the world."

Key Findings and Rankings:
- Of the top-10 largest economies in the world by total GDP, only the U.S. ranked in the top-10 for Digital Readiness at #3. However, readiness varies across the country which is also true for many countries.
- Singapore took the top ranking with strong performance in all seven components, including the top score in Human Capital and Business and Government Investment.
- Denmark, the Netherlands, Switzerland, Iceland, and Singapore are the top-five countries for Technology Infrastructure.
- The U.S., Canada, Luxembourg, Singapore, and the United Arab Emirates are the top-five countries for Technology Adoption.
- Japan, Singapore, Spain, Switzerland, and Iceland are the top-five countries for Basic Needs.
- Singapore, Iceland, New Zealand, Switzerland, and Kazakhstan are the top-five countries for Human Capital.
- Luxembourg ranked the highest in Europe at #2 overall, Israel ranked the highest in the Middle East at #21, and Botswana ranked the highest on mainland Africa at #76.
- Singapore ranked the highest in Southeast Asia at #1, South Korea ranked the highest in East Asia at #8, and Australia ranked the highest in Asia-Pacific at #12.
- The U.S. took the top ranking for North America at #3, Chile took the top spot for South America at #34, and Costa Rica took the top spot for Central America at #47.

It may be intuitive that technology infrastructure and adoption are strong indicators of a country's digital readiness, but our research shows that technology alone is not the answer. Developing skills, ensuring basic human needs are met, creating a business friendly and start-up environment, and making private and public investments in innovation and technology will aid countries in their digital future. On these measures, there is a wide spread of how nations are ready.

- The strongest components of digital readiness include: "Basic Needs," "Human Capital," and "Technology Infrastructure." In

Legend: Activate | Accelerate (Low) | Amplify | No data | Accelerate (High)
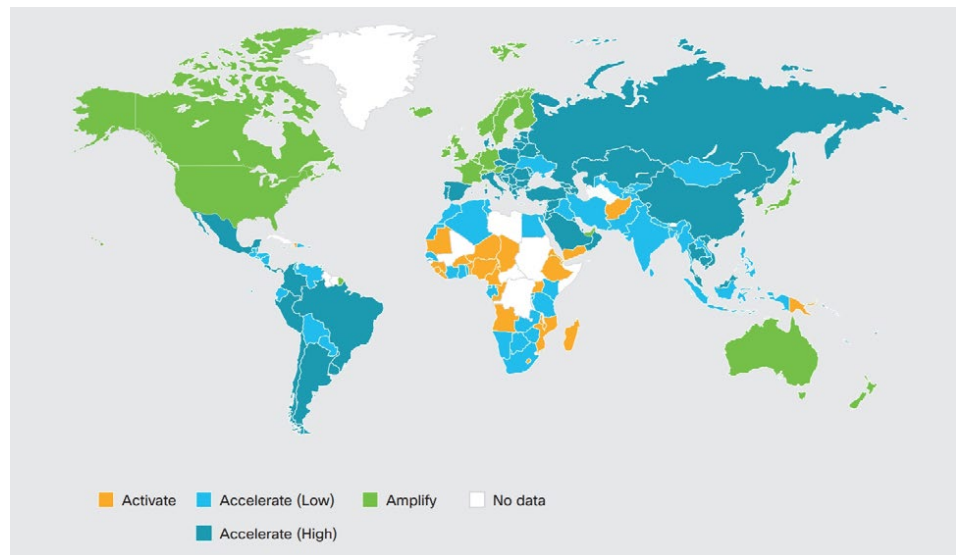
general, improvements in these three components will have the most impact overall on a country's level of digital readiness.
- Human Capital is critical across every stage of digital readiness to build a workforce capable of utilizing and creating technology, and developing new skills in emerging fields.
- There is strong correlation between countries' digital readiness scores and other performance indicators. For example, the higher a country's digital readiness score, the higher its GDP per capita.

Three stages of digital readiness emerged based on the findings: Activate, the lowest stage of digital readiness; Accelerate, the middle stage; and Amplify, the highest stage of digital readiness. The factors that impact a country's digital readiness differ depending on which of the three stages it falls. For example, those countries in the Activate stage would primarily benefit from improvements in Basic Needs and Human Capital development. The report showed that while countries in the Amplify stage lead in digital readiness, there is still plenty of room for advancement. These Amplify countries universally scored well for Basic Needs, including access to safe drinking water and electricity, and Ease of Doing Business, but they need to continue investing in these components to retain their position. However significant variation in terms of Business and Government Investment was identified, with many countries in a position to

benefit from improvement in this area. The report also showed that all countries could benefit from additional investment in Technology Infrastructure, such as access to broadband, secure internet servers, and more. Cisco's Global Digital Readiness Index is one of many projects driving our work to create a more inclusive digital world. This includes corporate social responsibility initiatives like the Cisco Networking Academy, which provides best-in-class training for students and professionals for the most in-demand IT jobs in networking, cybersecurity, and IoT. Cisco also provides grants and technical partnerships to nonprofits and non-governmental organizations (NGOs) focused on basic needs like reducing food insecurity, and increasing access to affordable housing, clean drinking water, and sanitation. Cisco has in-house programs that respond to natural disasters – improving the speed, efficiency, and effectiveness of humanitarian and disaster relief. Cisco also works through its Country Digital Acceleration (CDA) program to partner with national governments, industry and academia to deliver real digital outcomes faster and more effectively. "At Cisco, we believe it is important to contribute research to help the continuing dialogue on technology's future impact," Yoo added. "We hope to serve in partnership to bridge the digital divide and foster a more inclusive future where all citizens can participate and thrive."

Comviva to Drive Zain Jordan's Digital Ecosystem

Comviva, the global leader in mobility solutions, today announced its first strategic digital business management deal with Zain Jordan, a leading telecom company in the kingdom. As part of the multi-layer deal, Comviva will provide its industry-leading Digital Business Management Suite which includes Digital Services Delivery Platform (DSDP 2.0) and its expertise in Business Operations and digital content, which will help Zain to drive its growing digital ecosystem. Comviva's DSDP 2.0 platform, combined with its expertise in business operations and digital content will help Zain overcome these challenges, helping the operator to stay focused on creating winning digital experience for subscribers, while optimizing systems and processes for cost minimization and revenue gains.In a statement on the occasion, Ramy Moselhy, VP & Head of MENA Region at Comviva said, "This deal is of strategic advantage to Comviva, as it has given us a footing in the Jordanian market. We are extremely excited to extend our innovative value proposition to Zain, which will help the operator in overcoming the major hurdles in the digital service delivery." "We are glad to be partnering with Comviva as our digital business aggregator, and looking forward to benefiting from their expertise to help us boost our content related revenue while maintaining utmost customer experience and cost optimization," commented Zain Jordan. With the rising demand for digital services bringing increasing complexity in the content partner ecosystem, Zain Jordan has always desired to make the latest technology tie-ups in storage, access, fraud prevention and customer experience, while bringing whole-scale process improvements for optimizing operations. Comviva's DSDP 2.0 platform provides a mediating layer between Zain Jordan and digital service providers, specializing in various content formats like caller ring-back tone (CRBT), video, games, music, live streaming and so on. Unlike earlier, when content providers (CPs) would be dealing with invoices, billing and customer-relationship-management (CRM) integration separately for every new service, now there's a single DSDP 2.0 layer for service integration, making it easier for CPs to integrate services in Zain's growing digital ecosystem. With the aim of broad-basing the ecosystem of digital services, DSDP 2.0 will enable Content Providers to create an end-to-end service, helping those who have a rich content catalogue but lack the means to monetize their content. It provides support to new and exciting content mediums like augmented reality (AR) and virtual reality (VR), live streaming, e-sports, catering to new digital customer. Data and analytics-driven technologies will help the Zain to automate certain transactions with a greater degree of certainty, adding to the robustness of the system. With a single repository for digital service, the customer's digital journey will be uniform on various channels like IVR, SMS, app and so on. Similarly, DSDP 2.0's single business view, will allow the operator to take faster and more informed decisions on matters affecting their business.

New Benchmarks Show Status of Implementation of New EU Directives on Copyright in 12 Member States

Cullen International has published two new benchmarks showing the progress on the transposition in 12 EU member states of two recently adopted directives in the field of copyright: the Directive on Copyright in the Digital Single Market and the Directive on the exercise of copyright and related rights applicable to certain online transmissions for broadcasting organizations and retransmissions of television and radio programmes. Both directives need to be implemented by 7 June 2021. The research shows that in 9 countries a debate has already started on the implementation of the directive on Copyright and the Digital Single Market and that France has already implemented the rules on press publishers' rights. Concerning the other directive, 6 out of 12 member states have started the debate and Belgium has already introduced rules on direct injection. Cullen International will update these benchmarks regularly throughout 2020. To access the full benchmarks, please click on "Access the full content" - or on "Request Access", in case you are not subscribed to our European Media service.

Dialogic's Software Business Expands Enghouse's Product Portfolio

Enghouse Systems Limited announced it has acquired Dialogic Group Inc. for a purchase price of approximately $52.0 million, subject to certain adjustments. Based in Parsippany, New Jersey, Dialogic partners with leading mobile operators, system integrators and technology developers to deploy its solutions via its worldwide network of offices. Dialogic's revenue over the next twelve months is projected to be between $58.0 million and $63.0 million. Dialogic is an industry leader in media processing software, with a highly scalable solution that supports real-time video conferencing and collaboration

applications across all devices. Dialogic's infrastructure products offer a best-in-class Session Border Controller and several software-based network solutions to communication service providers. This combination enables the transformation from legacy TDM (time division multiplexing) to next-generation network platforms. "This acquisition strengthens our position in the enterprise video and unified communications market segment by adding rich multi-media processing applications and capabilities," said Steve Sadler, Chairman and CEO, Enghouse Systems. "In the communications service

provider market, Dialogic provides network infrastructure solutions that facilitate virtualization, the evolution to 5G networks and the transition of networks from hardware to software defined network connectivity. We are very pleased to welcome Dialogic's employees, customers and partners to Enghouse."

Eutelsat Successfully Launches Konnect Satellite

The Eutelsat KONNECT satellite was successfully launched into Geostationary Transfer Orbit by Arianespace using an Ariane 5 rocket that lifted off from the Guiana Space Center in Kourou, French Guiana, at 9.05 pm Universal Time (10.05 pm CET) on January 16. The separation of the all-electric satellite occurred after a 27-minute flight and the spacecraft systems checkout was successfully completed over a period of 3 hours. Built by Thales Alenia Space, the EUTELSAT KONNECT communications satellite, features all-electric propulsion and operates in Ka-band. It is the first satellite to use Thales Alenia Space's all-electric Spacebus NEO platform, developed under the Neosat Partnership Project conducted by the European and French space agencies (ESA and CNES). EUTELSAT KONNECT will assure full or partial coverage for up to 40 countries across Africa and 15 over Europe. Offering total capacity of 75 Gbps, by next autumn this high throughput satellite will allow the operator to provide Internet access services for both companies and individuals at up to 100 Mbps. Rodolphe Belmer, CEO of Eutelsat:

"Our congratulations to Arianespace and the Guiana Space Center teams for successfully launching our EUTELSAT KONNECT satellite towards geostationary orbit. The collaboration between Eutelsat, Thales Alenia Space and Arianespace on this ambitious satellite program has

resulted in a world-first broadband satellite for the African and European continents that demonstrates the suitability of satellite infrastructure as a means to deliver high quality broadband services, contributing to bridging the digital divide within rural areas."

FACEBOOK

Facebook Makes Major Commitment to UK

Facebook plans to hire 1,000 people in the UK this year, as it looks to boost efforts in removing harmful online content from its platforms, a representative told Mobile World Live. The move is due to be announced today (21 January) by Facebook's COO Sheryl Sandberg. The company said the appointments will take total staff numbers in the UK to more than 4,000, adding to the nation's status as its largest engineering hub outside its domestic US market. Additional staff will be deployed at Facebook's three locations in London. More than half of the new roles will focus on software engineering, product design, data science, and product development. The social media giant will also hire people for its teams involved in AI, AR and VR, and engineering infrastructure. The company said a large pile of the job offerings will aim to expand its unit dedicated to building tools to detect and remove harmful content from Facebook's platforms, including its core business, Messenger, Instagram and WhatsApp services. As part of its expansion plans, Facebook will construct new office space across two buildings in London with capacity for 6,000 workstations. The first is expected to open in late 2021. UK Prime Minister Boris Johnson welcomed the announcement, stating it was "great news Facebook plans to create a thousand more jobs in London – yet another sign of the strength of our dynamic tech sector". "We are committed to making the UK the safest place in the world to be online, alongside being one of the best places for technology companies to be based", he added. The social media giant's move could be seen as an effort to rebuild its reputation in the country after the Cambridge Analytica scandal in 2018, which revealed the political consulting company had obtained user data from Facebook to build software that could influence voters' choices in elections.

Facebook to Announce Fourth Quarter and Full Year 2019 Results

Facebook, Inc. announced that the company's fourth quarter and full year 2019 financial results will be released after market close on Wednesday, January 29, 2020. Facebook will host a conference call to discuss its results at 2 p.m. PT / 5 p.m. ET the same day. The live webcast of the call can be accessed at the Facebook Investor Relations website at investor.fb.com, along with the company's earnings press release, financial tables, and slide presentation. Following the call, a replay will be available at the same website. A telephonic replay will be available for one week following the conference call at 404.537.3406 or 855.859.2056, Conference ID: 1262637. Transcripts of conference calls with publishing equity research analysts held on January 29, 2020 will also be posted to the investor.fb.com website.

HUAWEI

Huawei Keeps Strong R&D Pace as 5th Top Investor Worldwide

Huawei has been ranked fifth on the recently released 2019 EU Industrial R&D Investment Scoreboard as one of the biggest investors in research and development worldwide. The Scoreboard is made up of the 2,500 companies investing the largest sums in research and development in the world, with data collected from companies' annual reports and accounts. As a result of its R&D investments focus, Huawei has been able to lead the development of 5G technologies globally and the Middle East region specifically. This has been powered by investments of USD4 billion in 5G research since 2009—more than the total 5G investment from all major equipment vendors in the US and Europe combined. Huawei began 5G research in 2009 and has submitted a total of 23,600 contributions to the 3GPP, which would be a stack more than 10 meters tall if printed out on A4 paper. Huawei now owns 3,367 families of 5G patents accounting for more than 20% of the total and ranking first among all ICT vendors. The company has established nine 5G standards and research centers worldwide, has more than 500 experts working on standards, and holds positions in over 100 standards organizations. As Q3 2019, Huawei had been awarded more than

sixty 5G commercial contracts, including 11 in the Middle East, shipping over 400,000 5G base stations globallyOutside of the 5G arena, Huawei's enterprise business has also benefited from R&D advancements to lay the foundation for the digital transformation of industries in the Middle East and abroad. Globally, more than 700 cities and 228 Fortune Global 500 companies have chosen Huawei as their digital transformation partner. A focus on innovation has also kept Huawei's popular smartphone range as a preferred global brand, achieving robust growth in 2019 with a total of 240 million units shipped. The latest ranking comes at a time when Huawei leadership estimates that its global sales revenue will have topped USD122 billion in 2019, an increase of roughly 18% year-on-year.

Huawei Wi-Fi 6 Ranked Number One Globally Outside of North America According to Dell'Oro Group

Huawei Wi-Fi 6 has been ranked Number One in the global market (excluding North America), according to a report on the global Wi-Fi 6 indoor AP market share from 2018 Q3 to 2019 Q3 by Dell'Oro Group, a leading independent market analysis and research firm. In October 2018, the Wi-Fi Alliance officially announced an all-new Wi-Fi naming system for Wi-Fi generations, with Wi-Fi 6 as the simplified name for IEEE 802.11ax. Wi-Fi 6 improves on Wi-Fi 5 with more than four times the maximum bandwidth per client and number of concurrent clients, and more than three times lower latency. Such improvements have led to Wi-Fi 6 being adopted by a growing number of enterprises, schools, hospitals, and other pioneers to connect everything on their campus networks. These early adopters are using Wi-Fi 6 to deploy innovative applications such as 4K/8K HD video conferencing, VR/AR interactive teaching, telemedicine, and intelligent robots. The latest Dell'Oro Group report is a testimony to the increasing popularity of Wi-Fi 6 among global organizations. According to the report, the overall revenue of the global Wi-Fi 6 market grew explosively in the first three quarters of 2019, growing to 30 times that of 2018. In the same period, the revenues of the Wi-Fi 4 and Wi-Fi 5 markets decreased slightly. This market performance also signifies that 2019 was the first year that Wi-Fi 6 was in commercial use. Huawei is a leader in the Wi-Fi 6 market. With its AirEngine Wi-Fi 6, Huawei took the lead in deploying the industry's first enterprise-class Wi-Fi 6 network in Shanghai as early as 2018. Since then, Huawei AirEngine Wi-Fi 6, powered by Huawei 5G, has been the preferred choice of many industry customers around the world, helping them to build the ideal Wi-Fi 6 networks with zero coverage holes, zero wait time, and zero packet loss during roaming. Customers include: Shenzhen Metro in China, Basel St. Jakob-Park stadium in Switzerland, Agos bank in Italy, Mondragon University in Spain, and University of Johannesburg in South Africa. Steven Zhao, President of Campus Network Domain, Huawei's Data Communication Product Line, said: "We are very pleased to see that Huawei AirEngine Wi-Fi 6 has been widely used across sectors like education, government, large enterprises, and manufacturing. Huawei AirEngine Wi-Fi 6 is helping more enterprises of all sizes to build user experience-centric networks for increased office and production efficiencies, paving the way for the large-scale rollout of digital services and accelerating digital transformation." Customers' trust in Huawei Wi-Fi 6 is attributed to Huawei's continuous investment and dedication to the emerging Wi-Fi 6 industry. Some key highlights include: Huawei's leading expert Osama Aboul Magd being elected as the chair of the IEEE 802.11ax Working Group in 2014, injecting his insights to continuously navigate the development direction of the Wi-Fi 6 industry standards. Huawei's contribution to Wi-Fi 6 standard proposals is the highest among device vendors. In October 2017, Huawei launched the industry's first commercial Wi-Fi 6 AP. Since then, Huawei has constantly expanded its Wi-Fi 6 portfolio by successively launching innovative products and solutions tailored to different scenarios. Huawei and Wireless Broadband Alliance (WBA) have joined forces to explore Wi-Fi 6-based teaching innovations and use cases at Mondragon University in Spain. In the future, Huawei will continue to work with upstream and downstream partners throughout the industry, focus on industry-specific scenarios, and deliver ideal Wi-Fi 6 network solutions for new digital applications. Huawei will also forge ahead with its AirEngine Wi-Fi series products and solutions powered by Huawei 5G to help enterprises build future-proof, fully-connected campus networks.

Lead the Way

Huawei Wi-Fi 6 Ranks No.1 Globally*
*Excluding North America

Source: Dell'Oro Group's global Wi-Fi 6 indoor AP market share report from Q3 2018 to Q3 2019

AirEngine

Microsoft Taps T-Mobile to Test Connected PCs

Microsoft prepared to launch a new connected PC pilot program next month, teaming with T-Mobile US to provide internet access to students in rural and underserved areas of the country. The company said the program will offer participating schools the chance to test two newly announced Windows 10 PCs, JP.IK's Turn T101 and the Positivo Wise N1212S, both of which are expected become available later this year. T-Mobile will provide SIM cards and free 4G service to power the devices. In a statement, Microsoft noted the goal of the pilot is to "learn how these new devices and alliances could reshape the education landscape and reduce the broadband gap". T-Mobile previously announced plans to offer home broadband and hotspot access to 10 million households with school-aged children, to help close a so-called homework gap if its proposed merger with Sprint is approved. A 2018 study by Pew Research Center found 17 per cent of US teens said they were often or sometimes unable to complete homework assignments due to a lack of reliable broadband connectivity at home.

Microsoft and MCIT, Care Egypt Foundation Collaborate on Women Empowerment across Egypt

The Ministry of Communications and Information Technology (MCIT) has announced a partnership with Care Egypt Foundation (CEF) and Microsoft to launch a 'Women Empowerment Campaign'. The initiative will contribute to social, economic and human capital development in Egypt by equipping the upcoming and existing female workforce with future-ready skills. As part of the 'Qodwa Tech' initiative of MCIT's Central Department for Community Development to empower women in Egypt, the campaign will see collaboration between MCIT, Care Egypt Foundation, and Microsoft with a focus on capacity building for women in digital fields of study and strive to encourage female entrepreneurship, as well as enable them to work across the country's public and private sectors, including in heritage handicrafts. It is also aimed at raising awareness of Artificial Intelligence (AI) and other future technology fields among the nation's female workforce. "Egypt's Sustainable Development Strategy requires that we tap into all our national talent to foster a spirit of innovation that drives economic growth," said Eng. Hoda Dahroug, Manager of the Central Department for Community Development at MCIT. "More and more female graduates are skilled in STEM; we have a responsibility to ensure their skills are put to good use, not only for their own empowerment, but for the benefit of society. The Women Empowerment Campaign will be a great contributor towards Vision 2030, and our partnership with Microsoft is a leap forward to encourage diversity in the country and bridge the gender-equality gap." "Digital transformation can be a great enabler of economic development, the progress called for in Egypt's Sustainable Development Strategy," said Mike Yeh, Associate General Counsel, Corporate, External and Legal Affairs (CELA), Microsoft Middle East and Africa. "Microsoft is committed to fostering diversity and inclusion in workplaces around the world, because we believe that such workforces are better able to innovate. Our partnership with MCIT and Care Egypt Foundation reiterates Microsoft's efforts to empower the women of Egypt and ensure that everyone has a seat at the table." Microsoft's collaboration with the MCIT and Care Egypt Foundation on the Women Empowerment Campaign builds on its ongoing strategic partnership with the Central Department for Community Development, which began in 2014. The partnership aims to support the ministry in creating a sustainable social model that contributes to addressing unemployment and economic challenges, by empowering women to achieve more. "Our focus at Care Egypt Foundation is putting women and girls at the center of our efforts, so everyone has an equal right and opportunity to improve their livelihood", said Dr. Hazem Fahmy, Director of Care Egypt Foundation. "This initiative, in partnership with MCIT and Microsoft is a strong component in our journey to empower women of all ages, by equipping them with future-ready skills to make a difference in society." "The empowerment of women and young girls is one of the core pillars of Care Egypt Foundation's interventions. We promote a gender equality culture at our workplace and implement gender-responsive policies where we work. We believe that an inclusive development approach is vital to achieving Egypt's Sustainable Development Strategy" added Dr. Fahmy.

Microsoft Pours $1B into Carbon-Curbing Tech

Microsoft committed to remove all of the carbon generated in its history by 2050, and to invest $1 billion into a new climate fund to develop carbon reduction, capture and removal technologies. In a blog, President Brad Smith outlined a set of goals to reduce the company's carbon footprint, including a pledge to become carbon negative by 2030. As part of its program, Smith said Microsoft will shift to 100 per cent renewable energy in the next five years. The company also vowed to reduce its carbon emissions by more than half and switch its global operations vehicle fleet to electric by 2030. By 2050, Smith explained, Microsoft plans to remove all the carbon emitted since its foundation in 1975, through negative emission technologies potentially including forestation, removing carbon from soil, bioenergy with carbon capture and storage, and direct air capture. From July, Microsoft will require its business divisions to pay an internal carbon fee for indirect emissions produced from its supply and value chains. Over the next four years, the company's Climate Innovation Fund will invest $1 billion

into new technologies for reducing and removing carbon from the environment. "We understand that this is just a fraction of the investment needed, but our hope is that it spurs more governments and companies to invest in new ways as well", Smith commented. He added the

company will continue investing in carbon monitoring and modelling projects through its AI for Earth program. Smith described the company's plan to reduce its carbon footprint as a "moonshot" for Microsoft. "And it will need to become a moonshot for the world", he stated.

Mobily First to Test 5G Services over Standalone Network in the Kingdom

Mobily made a major leap after the successful completion of the first 5G call made using 5G stand-alone (5G SA) network in the Kingdom. Unlike all currently available 5G networks in the Kingdom,

a 5G SA network does not rely on traditional 4G technology and offers pure 5G network technology from handset to radio and to the core offering higher speeds along with ultra-low latency. Chief Technology Officer at Mobily Eng. Alaa Malki said: "The trial took place in Eastern region and showcased the immense potential of 5G technologies, with the 5G SA smartphone achieving high download and upload speeds along with the capabilities that will help facilitate new digital applications for businesses and individuals in the country. The latest trial was made possible by recent Mobily network upgrades." 5G SA architecture provides immense throughputs and low latencies as well as enables Mobily to target new markets including enterprise and industries using flexible and distributed network architecture. Mobily's ongoing investments and trials in 5G technology are part of its wider support of digital transformation in line with the Kingdom's Vision 2030, implementing cutting-edge technologies to enhance industries and public services. With 5G services, Mobily customers can expect faster download and upload speeds, lower latency and enhanced security.

Nokia Counts 63 Commercial 5G Deals to Kick Off 2020

Nokia ended 2019 rather badly when it admitted during its third quarter 2019 earnings call that it was having to pivot on its 5G chip strategy. But the company is kicking off the new year with some determined optimism. Nokia said today that it had reached 63 commercial 5G contracts worldwide. The figure includes named customers such as AT&T, Verizon, Sprint, T-Mobile, KDDI, NTT Docomo, Korea Telecom and LG Uplus. The 63 signed commercial contracts exclude any other type of 5G agreements, such as paid network trials, pilots or demonstrations. The company said if such agreements were to be included, the total number of 5G agreements would reach over 100. It also said its 5G products are running in 18 live networks. "Nokia is the only network supplier whose 5G technology has been contracted by all four nationwide operators in the US, all three operators in South Korea and all three nationwide operators in Japan", said Tommi Uitto, president of mobile networks at Nokia, in a prepared statement. "We have more than 350 customers in 4G, but these first 63 customers represent some two-thirds of our global radio access networks business in a typical year." The vendor says the 63 contracts include work across low, mid and high bands and across traditional

"This milestone of 63 commercial 5G deals highlights the quality and customer confidence in our 5G portfolio.

Nokia is the only network supplier whose 5G technology has been contracted by all four nationwide operators in the US, all three operators in South Korea and all three nationwide operators in Japan."

Tommi Uitto
President of Mobile Networks

and cloud network architectures. In comparison, Ericsson said on December 27, 2019, that it had 78 commercial 5G agreements or contracts with unique service providers, 31 publicly announced 5G contracts, and was live with 24 5G networks across the globe. On Nokia's 3Q 2019 earnings call, Nokia CEO Rajeev Suri said that when the company started working on 5G, it chose field programmable gate array (FPGA) silicon for its 5G products because it provided flexibility and time-to-market advantage. But the FPGAs were expensive, and ended up cutting into Nokia's profit margins in 5G. The company lowered its guidance for full year 2019 and

2020 and suspended its dividend. Last fall, Nokia made the decision to move to custom SoC-based products. "To ensure that we execute on this fast and effectively, we are increasing investment in system on chip capabilities and moving aggressively to strengthen and diversify our supplier base," said Suri on the earnings call. Nokia has had three different people head up its mobile networks division during a four-year time frame. About a year ago, it replaced the former head of mobile networks Marc Rouanne with Tommi Uitto. Rouanne has since moved to Dish Networks as its chief network officer for its wireless initiative.

Nokia and Angola Cables Trial the First Direct Optical Connection between USA and Africa with PSE-3 Chipset

Nokia has won a tender to test and deliver the world's first standalone (SA) 5G system for automated rail operation in Hamburg, Germany. The project is part of Deutsche Bahn's highly automated S-Bahn operation project. The proof-of-concept will test whether 5G technology is mature enough to be used as the connectivity layer for future, digitalized rail operations. The project constitutes an early and important step in the development of the Future Railway Mobile Communications System (FRMCS) standard, based on 5G, and sets the stage for the digital transformation of railway

operations. Nokia is a leader in this market with extensive experience in providing GSM-R systems to rail operators in 22 countries, covering 109,000 km of track. Overall, Nokia has provided networking, cybersecurity, IoT and analytics solutions to 110+ operators for both mainline and metro rail. This project to deliver the first 5G SA solution for rail operation, further emphasizes Nokia's leadership position. By 2021, as part of the project "Digitale S-Bahn Hamburg", highly automated trains (with train drivers on board who keep safety responsibility) are expected

to operate on a 23-kilometer section of the S-Bahn Line 21, starting at Berliner Tor, one of the main transport hubs in Hamburg. Part of the demonstration will include fully driverless shunting of empty trains in an area near Bergedorf station, based on the transmission of train control information over the Nokia 5G mobile network. The Nokia 5G solution is based on 3GPP standards for 5G mobile networks, allowing highly or fully automated trains to exchange relevant data with trackside equipment by 5G radio. This will have positive effects on cross-border operation,

Taking light to the limit

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Pioneered by the innovators at Nokia Bell Labs, our super coherent PSE-3 chipset is taking light to the limit of physics and shaping the future of networking.

Experience how extreme new levels of performance and flexibility can power awesome video, mobile and cloud experiences - whether they're 10 km, 10,000 km or beyond.

Ultimate performance.
Unconstrained flexibility.
Radically simplified programmability.

+25%
Optical wavelength performance vs today's most advanced systems

+65%
Increase in capacity over commonly deployed networks

+60%
Reduction in power per bit

capacity of rail infrastructure, punctuality of trains and also on customer experience. Kathrin Buvac, President of Nokia Enterprise and Chief Strategy Officer, said: "We are very pleased to be Deutsche Bahn's partner, bringing digital technology to the forefront of the Hamburg S-Bahn network and rail system. Together, we have worked to research, develop and deliver the world's first 5G-based communication system for automated rail operation, an important milestone towards the Future Rail Mobile Communication System and a major step in making Industry 4.0 a reality."

Oman Broadband Covering Half a Million Housing Units with Optical Fiber

The company has covered approximately 4,581 residential units throughout the region, which are now ready to request service through one of the licensed service providers in the Sultanate (Omantel, Ooredoo and Awasser). The project was implemented in 10 months due to the nature of the area and the difficulty of its topography. It is worth mentioning that this project is one of the most important achievements of the company because the network in Jabal Al Akhdar was also connected to Muscat to link the establishments in Muscat with the establishments in Jabal Al Akhdar - one of the tourist destinations for Omanis and foreign tourists. The presence of the optical fiber network will contribute to the revitalization and activation of tourist and commercial activity in the region. It is worth mentioning that the company started building the network since 2015

as part of the government project to cover the Sultanate with fiber optic network. Large parts of the Sultanate's governorates were covered by the service; approximately 400,000 housing units and connected around 86,300 housing units. Approximately 81,600 housing units were also connected in Muscat, 2,500 in North and South of Al Batinah Governorates, 1,800 in Dhofar Governorate and 400 in Al Dakhiliyah Governorate. The company also signed several agreements with some real estate developers to spread the network, such as WUJHA Real Estate Company, Dar Al Zain Company, Assas Company and Bahwan Engineering Company. 'The efforts are still ongoing to open new areas in the last quarter this year. Some areas in Al Batinah North Governorate will be opened this year. Approximately 8,438 housing units will be opened. Some parts will also be opened in Muscat and Dhofar

governorates with an average of 39,586 housing units in Muscat and 29,931 in Dhofar, said Eng. Said bin Abdullah al Mantheri, CEO of Oman Broadband Company. It is worth mentioning that the company is entrusted with building the fiber optic infrastructure and leasing it to the three operators Omantel, Ooredoo, and Awaser. This has contributed significantly to the speed of the Internet and lower prices in the areas covered by the network. So far, the company has covered 54% of urban areas and will cover 95% of them by 2030 to achieve the national broadband strategy.

Muscat Governorate

The company has connected approximately 81,600 housing units in Muscat Governorate in the wilayats of Seeb, Baushar, Al Amirat, Muttrah from 2015 until mid-2019. Efforts are continuing in the last quarter of this year to cover

areas in Baushar, Maabila, Qurum and Ansab, about 45,000 housing unit to help users enjoy high-speed Internet.

South and North Al Batinah Governorate Approximately 2,500 housing units have been connected in the South and North Al Batinah Governorate, specifically in Sohar. The project was implemented in cooperation with Haya Water Company, in order to maximize the utilization of infrastructure projects and unify efforts to reduce cost and time. Efforts are continuing with the aim of inaugurating some new areas in North Al Batinah Governorate, specifically in Sohar, with an

average of 8,438 housing units. Work is also continuing in the wilayat of Al Awabi in South Al Batinah to connect approximately 11,000 housing units.

Dhofar Governorate
As part of the efforts to spread the network in the south of the Sultanate, the company signed several agreements with some government authorities in Salalah, such as Salalah Sewerage Company, Dhofar Municipality and Salalah Free Zone, which facilitated the construction of the network. About 1,800 housing units were connected in Dhofar, new Salalah, Al Saadah and Raysut. Efforts are underway to cover the

remaining parts of new Salalah and East Salalah with an average of 17,000 housing units to be ready before the end of this year.

Al Dakhiliyah Governorate
Approximately 400 housing units were connected mostly in Al Jabal Al Akhdar. Efforts are underway to cover some parts of Nizwa, such as Farq and Hay Al Turath, with an average of 16,000 housing units. The residents will enjoy high quality fiber optic network which will help users chose the best from among the three operators.

PCCW Global

Major Bandwidth Boost for Africa as PEACE Heads South

PCCW Global, the international operating division of HKT, Hong Kong's premier telecommunications service provider, and PEACE Cable International Network Co., Limited, will cooperate on the PEACE South extension of the Pakistan East Africa Connecting Europe (PEACE) submarine cable system. This cooperation positions PEACE as a major cable system to head south from the crucial high-speed Europe-Asia route, in a move that will deliver far-reaching connectivity benefits to the entire southern African region. The cooperation on extension of PEACE to southern Africa follows the

overall success of the cable development project and the smooth implementation of operations, from survey activities and the issuing of the relevant country permits through to manufacturing and factory acceptance. An experienced development team has successfully steered the overall project, including the implementation of an innovative commercial component to bundle traditional and new capacity products and services on the same cable system. New technologies deployed in the construction phase of the project will enable each country's bandwidth allocation to be modified during the

lifetime of the cable. Once the cable is live, individual cable stakeholders will have the ability to independently structure the network according to their own specifications, without affecting others using the same cable system. The PEACE South extension will have an important impact on connectivity from its current African landing point in Mombasa all the way to South Africa, opening new Southern African Development Community (SADC) and East African markets to cable partners. In addition, PEACE South will provide alternative routes for existing systems, connecting southern Africa to Europe and Asia with newer, faster high-bandwidth technology and assisting the region to improve Internet usage and reduce the cost of connectivity. When completed, the high-speed PEACE cable system will offer very low latency routes from China to both Europe and Africa, interconnecting three of the world's most populous continents, whilst delivering a superior connectivity experience which will be ideal for a vast array of commercial and consumer applications. While still in development, the PEACE cable system has already proved itself as being the fastest and most agile cable connecting Africa and the Middle East to Europe. Mr. Frederick Chui, Chief Commercial Officer, PCCW Global, said, "Since the construction of Peace East

and Peace Med are both expected to be completed on time, on budget and within the originally specified plan of work, the planned extension through Peace South is a natural expansion for Asian investment in Africa, enhancing cooperation and shared economic benefits in the exchange of goods, technology and ideas." Mr. Sun

Xiaohua, Chief Operating Officer, PEACE Cable International, said, "We see the PEACE project as a strategic pivot for the HENGTONG Group to further expand as a subsea cable investor and we look forward to identifying new investment opportunities in this market. Investment in the PEACE South extension is being provided solely

by the PEACE partnership, with commercial implementation assistance from PCCW Global. This illustrates the extent of our commitment to the project as a major strategic opportunity to spearhead the deployment and commercialization of better connectivity between Africa, Europe and Asia."

stc Bahrain Extends Reach of 5G Network

stc Bahrain (previously known as Viva Bahrain) has announced the launch of the next phase of its 5G network in partnership with Chinese equipment supplier Huawei. Following an initial launch in selected areas in June 2019, the operator's 5G mobile

broadband and home broadband services are now available across more than 50% of the country, enabling customers to enjoy data speeds of up to 1.2Gbps. Prices for 5G home broadband plans start at BHD21 (USD55) per month for download speeds

up to 40Mbps, a 600GB monthly data allowance and an additional 3GB a month of mobile data, subject to a 24-month contract. To access 5G mobile services, pre-paid and post-paid subscribers pay an extra BHD5 a month.

Strategy & boosts Middle East TMT Practice with Two New Partners

The Technology, Media, and Telecom (TMT) practice of Middle East consultancy Strategy& has been given a leadership boost for the new year with two additional partners; Karim Sarkis, who joined the firm at the beginning of 2018 (after an earlier career stint at Strategy& predecessor Booz & Company), and Lancelot Sursock, who returns to Strategy& after spending over a decade with Booz to 2015.
Karim Sarkis
Sarkis heads up Strategy&'s Media and

Entertainment business in the Middle East, with expertise in culture, entertainment, and media sector strategy. A software engineering masters holder from Imperial College London, he boasts over 25 years of consulting and media industry experience, originally joining Andersen Consulting in 1992 for three years before spending a further four at Arthur D. Little. From there, Sarkis served as a senior associate in the GCC and UK for Booz & Company, with a focus on strategic consulting in the

telecom sector, before going on to join the Lebanese Broadcasting Association as Deputy Head of Channels and later as the Executive Director – Broadcast Group for Abu Dhabi Media. In 2012, Sarkis co-founded Sync Media, and joined Strategy& as a senior executive advisor at the start of 2018. Among noted recent assignments for Strategy&, Sarkis is credited with assisting a GCC ministry of culture in various projects including film infrastructure strategy and public library

strategy; participating in defining the media sector strategy for Saudi Arabia in respect to Vision 2030 objectives; and determining content types, packages, and pricing for an OTT offering across KSA, the UAE, Bahrain, and Kuwait.

Lancelot Sursock

Sursock meanwhile brings over 15 years of regional TMT-focused consulting experience to the table at Strategy& – almost eleven and a half of those spent at Booz & Company/Strategy& to 2015 before his recent return. In between, Sursock spent just over three and a half years at strategy competitor A.T. Kearney, while prior to Booz & Co he kicked off his career as a financial analyst at Banque de France. Graduating with a bachelor's degree in

Karim Sarkis   **Lancelot Sursock**

economics from American University of Beirut, Sursock has since added a master's in finance from ESSEC and an INSEAD MBA, and will at Strategy& focus on "the CFO agenda powered by digital and the steering of profitability and returns" –

two areas of expertise. During his career, Sursock has led a number of wide-scale engagements, including multi-billion cost transformation.

Syniverse and Samsung SDS Simplify Mobile Payments for Anyone with a Phone

Strategic Partnership Agreement

January 9th, 2020

At the 2020 International CES®, Samsung SDS, a global leader in digital transformation and innovation solutions, and Syniverse, the world's most connected company, announced today they have signed a memorandum of understanding to develop a wallet-agnostic, mobile payment platform to enable regulatory-compliant, cross-region mobile transactions for mobile operators and enterprises in

logistics, financial, travel and hospitality, media and entertainment, and retail markets. The companies will bring together Samsung SDS's Nexledger Universal platform and Syniverse's industry-leading blockchain solution, Universal Commerce, and market-aware Mobile Engagement platform to develop a common platform that will work with any mobile operator and allow any mobile user to send money,

loyalty points, or other digital currencies to other mobile users or merchants on a global basis. Samsung SDS and Syniverse developed the platform using a motto of simplicity that "Your phone number has become your easiest payment method." Samsung SDS and its Nexledger Universal platform allow enterprises to take control of distributed transactions, securely and conveniently. The platform has been implemented in various fields, such as finance, manufacturing, logistics, and the public sector. Nexledger Universal offers a flexible application programming interface that can be applied to different blockchains like Ethereum, Hyperledger Fabric and Samsung's own Nexledger Consensus Algorithm. In addition, Nexledger Universal can interoperate with diverse wallet-device architectures from vanilla Android to the defense-grade Samsung Knox for exceptional security when needed. Syniverse's mobile technology products and services provide a secure instant-access platform for seamless, customizable multi-channel messaging and connectivity. The platform connects more than 7 billion mobile devices in 158 countries and annually processes more than $35 billion in transactions for mobile

operators and enterprises. Syniverse's Universal Commerce blockchain service simplifies, accelerates, and secures multiparty agreements by replacing manual processes with smart contracts, unifying data records, and providing encryption. It reduces the friction of doing business in a revenue-sharing world of large-scale global services and technologies – regardless of industry or connectivity type. Scott Koo, President, Samsung SDS America said. "The need for simple, fast, secure, auditable and cost-effective monetary transactions is growing worldwide. Today the cost to consumers and merchants is too high. The proven attributes of blockchain along with

the scalability and flexibility of Nexledger Universal, and Syniverse's decades of payment and settlement experience, create the opportunity to lead the market in delivering a frictionless phone-to-phone or phone-to-merchant payment engine for secure, simple exchange of value. With our shared values, differentiated offerings and extensive capabilities, Samsung SDS and Syniverse are primed to securely convert your mobile phone into an easy-to-use digital wallet." Dean Douglas, Chief Executive Officer and President, Syniverse said. "Our goal is to establish universal financial transaction trust for every connected device in the world. As part of this, we're focused on

reducing the friction of cross-regional mobile payments and addressing ever-increasing regulatory requirements by leveraging blockchain technologies. Today's digital transformation requires mobile operators and businesses to offer their customers and employees seamless mobile experiences, especially in the area of clearing and settlement. In collaboration with Samsung SDS, we intend to integrate the power of blockchain to design a mobile wallet platform that solves some key challenges of mobile payments and builds trust in a mobile user's identity, device and transaction."

Philippine Telcos Form Joint Venture, Select Syniverse to Enable Mobile Portability Services

The Philippines' major mobile operators Globe, new player Dito Telecommunity and PLDT subsidiary Smart Communications have joined forces to put up a new company using fresh investments to enable number porting services in line with the new mobile number portability initiative of the government. This is an important first step towards the full implementation of Republic Act 11202 also known as the "Mobile Number Portability Act" ("the MNP Act"). Syniverse, the world's most connected company, was chosen by the Philippine mobile operators through a rigorous technical and commercial evaluation process, to be the mobile number portability service provider (MNPSP). The company will bring in the technical infrastructure to fulfill its primary function as clearinghouse for the telcos and ensuring smooth implementation of number porting services. "For more than 30 years, Syniverse has been the trusted spine of mobile communications by delivering the industry-leading innovations in software and services that now connect more than 7 billion devices globally and process more than $35 billion in mobile transactions each year. With recognition by the Philippine mobile operators, we are confident that the Mobile Number Portability project will

be another key milestone marked in mobile services in the Philippines," said Paul Hodges, Senior Vice President of Sales, Syniverse. The company is expected to bring in the technical infrastructure to fulfill its primary function as clearinghouse for the three mobile operators to ensure the smooth implementation of number porting services. Under the Implementing Rules and Regulations of the MNP Act, the mobile operators will equally share the capital expenditure for the software, hardware and other facilities required by the MNPSP. However, the sharing of operating and maintenance costs shall be agreed upon by the mobile operators and the MNPSP. As MNPSP, Syniverse is likewise expected to fulfill all functions outlined in the implementing rules and regulations under the NTC Memorandum Circular 03-06-2019 issued in July this year. With the initial step of setting up the support mechanisms, the actual implementation of MNP will be contingent upon the completion of integration and interoperability tests of the clearinghouse facilities with the separate multi-vendor systems of the mobile operators. "We've taken the key steps forward but there's still a lot of work to be done in terms of technical preparations. We at PLDT and Smart have geared up for this. We are

taking steps to put in place a seamless and efficient process for our existing and would-be customers who would like to avail of this service in the future," said Alfredo S. Panlilio, Chief Revenue Officer of PLDT and Smart, and President of Smart. "Given the technical and operational complexity of mobile number portability, we wanted to make sure the MNPSP has the experience and capacity to fulfill its obligations under the law. Our utmost priority is to ensure that the experience of our customers is seamless and of utmost convenience should they decide to port their numbers. We are one with the government in having our customers enjoy global mobile practices," Globe Chief Technology and Information Officer and Chief Strategy Officer Gil B. Genio said. Through the MNP Act, mobile phone users can keep their numbers even when they transfer to another service provider, or when they switch their subscription from postpaid to prepaid, or vice-versa. Mobile Number Portability refers to the ability of a mobile postpaid or prepaid subscriber, who has no existing financial obligation to the current service provider, to retain an existing mobile number despite having moved from one mobile service provider to another, or to change the type subscription from postpaid to prepaid or vice versa.

Tech Mahindra's Diversity and Inclusion Initiatives Recognized by Bloomberg

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business reengineering services and solutions, announced today that its diversity and inclusion initiatives have been recognized by Bloomberg. Tech Mahindra is amongst the only three Indian companies to be included in the Bloomberg 2020 Gender-Equality Index (GEI). GEI measures gender equality across five pillars - female leadership and talent pipeline, equal pay and gender pay parity, inclusive culture, sexual harassment policies, and pro-women brand. Tech Mahindra was evaluated on the basis of financial performance committed to supporting gender equality through policy development, representation, and transparency. Harshvendra Soin, Chief People Officer, Tech Mahindra, said, "Tech Mahindra's inclusion in the Bloomberg Gender-Equality Index is a testimony of our effort to create a diverse and inclusive ecosystem. At Tech Mahindra, we value individual differences and focus on providing equal opportunities to all our associates. For us, diversity of every kind is a priority - whether it is diversity of nationality, age, gender, thoughts, or abilities, and our constant endeavor is to

build a workplace that is 'intentionally' diverse." As part of this report the index includes 325 companies across 50 sectors headquartered across 42 countries and regions. This year, Bloomberg expanded the eligibility for inclusion in the index to nearly 6,000 companies across 84 countries and regions. In 2019, the GEI had 230 companies from 36 countries and regions. Peter T Grauer, Chairman of Bloomberg, said, "The 325 companies included in the 2020 GEI have shown their commitment to transparency and demonstrated leadership in gender-related data reporting. Disclosure of company

statistics and practices is an important first step in supporting gender equality globally." Tech Mahindra has been one of the early adopters of laying out an inclusive and non-negotiable, diversity and inclusion (D&I) policy. As part of TechMHRNxt, under Tech Mahindra's TechMNxt charter, an initiative to provide the 'workplace of the future' and enhance employee experience, dignity of each associate is upheld as one of our core values. At Tech Mahindra, diversity is an instrument of growth, and the uniqueness of every individual is celebrated by fostering an environment of inclusion and empowerment.

PRESS RELEASE
DIVERSITY & INCLUSION
TECH MAHINDRA AMONGST THE ONLY
THREE INDIAN COMPANIES
TO BE INCLUDED IN THE
BLOOMBERG 2020 GENDER - EQUALITY INDEX

Tech Mahindra Recognized as a 'Leader' by Everest Group

Tech Mahindra Ltd. a leading provider of digital transformation, consulting and business reengineering services and solutions, has been recognized as a 'Leader' in the Everest Group Automotive Engineering Services PEAK Matrix® Assessment for the year 2019. Focus on proactive investments in innovation labs, certifications in next generation technologies, key acquisitions to strengthen the digital portfolio, and Tech Mahindra's end-to-end offering across domains to enable customer's digital transformation journey were amongst the key assessment criteria. As part of this report, Everest Group classified service providers on the PEAK Matrix® into Leaders, Major Contenders, Aspirants, and

positioned Tech Mahindra as a "Leader" for its strong capabilities in automotive engineering services. Akshat Vaid, Vice President, Engineering Services Research & Advisory, Everest Group, "Tech Mahindra retained its leadership position in the 2019 PEAK Matrix® Assessment due to its continued focus on both core and digital engineering aspects across automotive value chain. A sizeable portfolio of automotive engineering solutions and IP (Internet Protocol), recognition as a leading brand in providing differentiated automotive design and styling services, courtesy Pininfarina and Bio, as well as infrastructural investments in labs and COEs such as Ayati, have helped the company emerge as a major automotive

engineering services player servicing auto majors across all major geographies and segments." Tech Mahindra was evaluated across a range of parameters such as "vision & capability" and "market impact" including services, products, solutions and locations. It was positioned as a 'Leader' based on - top quartile performance across market success; delivery capability captured through ability to deliver services successfully through scale, scope, enabling capabilities and delivery footprint; expertise in, and driving focus on technologies of the future, investments in strategic platforms; customized industry specific solutions and advisory role in a customer's digital transformation journey. Karthikeyan Natarajan, Global Head, Engineering,

Internet of Things and Enterprise Mobility, Tech Mahindra, said, "This recognition is a testimony to our continued investments in becoming a full stack service provider in the automotive engineering space with capabilities across research and development product engineering, design, consulting, manufacturing services, software development & aftermarket. As part of the TechMNxt charter, this enables us to provide solutions to customer's challenges and help them to be agile in building intelligent and cognitive products and platforms. We are consistently focused on delivering safe, secure, connected and robust customer experiences during the transition of the industry from hardware- to software-defined vehicles." Tech Mahindra's Integrated Engineering Solutions (IES) delivers solutions enabling "Digital Engineering Enterprise" across Aerospace and Defense, Automotive, Industrial, Telecom, Hi-Tech, Healthcare, Transportation and ISVs. With 50+ exclusive engineering development centers supporting new program launches

Tech Mahindra recognized as a 'Leader' in Automotive Engineering Services by **Everest Group PEAK Matrix™**
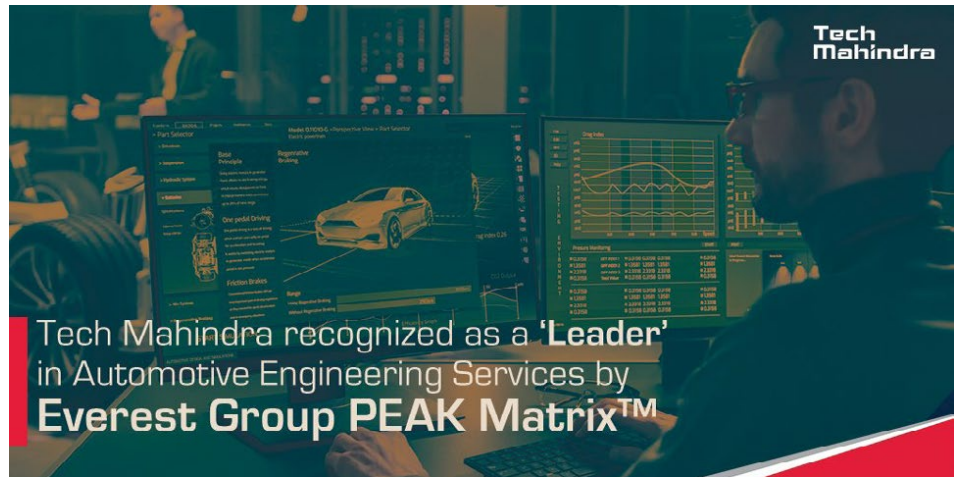
and 120+ marquee global customers, Tech Mahindra IES is an established leader for Engineering Services in the industry. Tech Mahindra brings together a blend of talent, technology, business acumen, and domain expertise to collaborate with enterprises on their engineering journey – helping them accelerate positive outcomes from existing engineering initiatives and investments, invent new products and IP

(Internet Protocol) for driving competitive advantage and differentiation, and transform business models in alignment with the dynamic market requirements, while traversing towards a sustainable future. Tech Mahindra delivers exponential value to engineering enterprises by collaborating with them across three key tenets: Robust products, Ubiquitous platforms and Cyber factories.
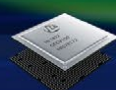
Huawei OceanStor Dorado

All-flash Storage
Extreme Performance, AI-Powered

CPU Chip
Kunpeng 920

BMC Chip
Hi1710

Network Chip
Hi1822

AI Chip
Ascend 310

SSD Chip
Hi1812e

ARTICLE

Technology for Everyone

> *Achieving a world in which technology makes life better for every individual, every family, and every organization, requires a collaborative approach that focuses on not only technology distribution, but the development of applications and skills.*

Technology is at the heart of today's society, and yet it is not as inclusive as it should be. Achieving a world in which technology makes life better for every individual, every family, and every organization, requires a collaborative approach that focuses on not only technology distribution, but the development of applications and skills. By working together as a united information and communications technology (ICT) sector, and in partnership with the public and private sectors, we can bridge the digital gap to enable society to thrive as a whole in the age of intelligence.

The Earth is home to 7.5 billion people, but only half of the world's population has access to digital technology. In a world that is increasingly driven by digital technology, it is essential that we close the digital divide by working to empower the unempowered, so that everyone has the same digital rights.

Huawei believes that no one should be left behind in the digital world. Our TECH4ALL initiative centres on bringing partners together to develop digital inclusion and empowerment initiatives for the following four high-impact domains: environment, education, health and development. One of the key purposes of TECH4ALL is to accelerate the United Nation's Sustainable Development Goals (SDGs).

TECH4ALL has three core areas of focus: technology, applications, and skills. Through the technology focus, Huawei aims to make digital technologies affordable for developing regions with scalable, low-cost products, and solutions. The application focus aims to create digital ecosystems and help developers to build applications for different communities and industries. Last but by no means least, the skills focus sees Huawei work with local governments, communities, organisations, and other partners to improve society's digital skillset.

Li Xiangyu (Spacelee)
VP of Public Affairs and Communications
Huawei Middle East

Our TECH4ALL initiative centres on bringing partners together to develop digital inclusion and empowerment initiatives for the following four high-impact domains: environment, education, health and development. One of the key purposes of TECH4ALL is to accelerate the United Nation's Sustainable Development Goals (SDGs).

The benefits of pursuing an inclusive digital society go beyond simply providing people with 'nice to have' Internet access. There is a clear correlation between technology and economic growth. Digitising public services is something that governments are actively pursuing not only because it makes sense by making processes more accessible and faster, but because good digital government can help businesses to flourish, increase citizen engagement, and provide a long-term boost to the economy. Digital government helps to make public institutions more inclusive, effective, accountable, and transparent, which in turn builds higher levels of public trust.

Technology also has the potential to increase social welfare and increases happiness, which has a positive knock-on effect on productivity. Happy people are, after all, more likely to be successful.

Connecting Remote Communities
A recent example of the power of connectivity can be seen in Mongolia, a vast but sparsely populated country with a widely dispersed population density of around 1.9 people per km2. More than half of the population lives outside of cities and towns – and four in 10 rural dwellers are nomadic. Only 100,000 homes out of 850,000 have Internet access.

To address this, Huawei collaborated with Unitel to launch a wireless home broadband solution in 2017. The service, Ger Internet, delivers rural connectivity to remote areas of Mongolia. There are 50,000 homes currently using the service. Users are reaping tangible benefits, such as receiving up-to-the-minute weather forecasts and the latest farming techniques, helping them to increase productivity. Businesses are able to build websites, with results already showing an impressive 190% increase in profits in three months due to advertising and

By 2025, 85% of business applications will be cloud-based, and 97% of large companies will use artificial intelligence (AI). However, there won't be enough qualified engineers to operate these technologies if we don't act now – which is where the Huawei ICT Academy, part of the TECH4ALL programme, comes into play.

a wider customer base. Internet access enables users to access online medical consultations and learning, and is helping to bring families who live apart together – such as when Kuta, a rural-dwelling eight-year-old boy received a video call for the first time from his brother, who studies in Korea.

Bridging the Talent Gap
The benefits of a digital future can only be fully realised by professionals who have the skills and understanding to push the boundaries of technology further. At present a gulf exists between the number of job vacancies in the ICT sector and the engineers available to fill them – and the gap is widening. By 2025, 85% of business applications will be cloud-based, and 97% of large companies will use artificial intelligence (AI). However, there won't be enough qualified engineers to operate these technologies if we don't act now – which is where the Huawei ICT Academy,

part of the TECH4ALL programme, comes into play. The ICT Academy operates in partnership with universities from around the world to address the talent gap by providing students with hands-on training in the latest technologies, providing them with the foundation to become the next generation of great innovators.

A connected world opens doors – and a properly skilled workforce can achieve incredible things in the digital age. Technology brings new opportunities that benefit whole societies as much as the individuals that live within them. People have the chance to thrive, and economies prosper as a result.

We believe that inclusive technology is a universal goal. Together we can make a difference – Huawei's TECH4ALL is a collaborative initiative that seeks ways to ensure that technology can benefit everyone, everywhere.

A connected world opens doors – and a properly skilled workforce can achieve incredible things in the digital age. Technology brings new opportunities that benefit whole societies as much as the individuals that live within them. People have the chance to thrive, and economies prosper as a result.
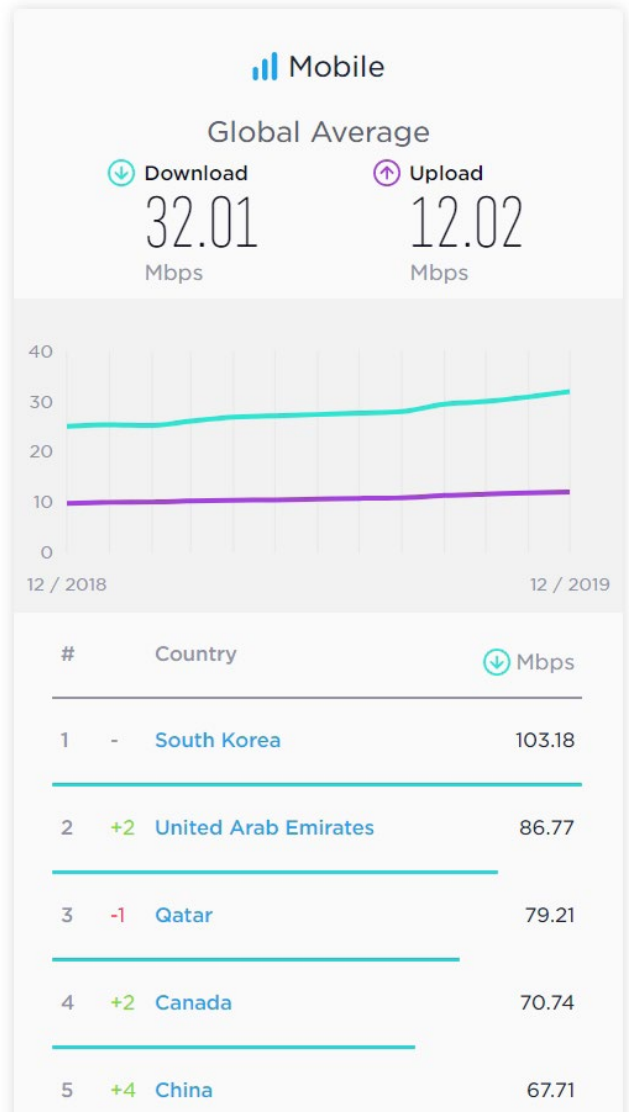
عرب سات
°26 شرقاً
مستقبل صناعة البث
في الشرق الأوسط وشمال افريقيا

REGIONAL NEWS

United Arab Emirates Ranks Second in the Global Mobile Broadband Speed Test

The United Arab Emirates has risen two places to take second place in the global mobile broadband speed test in December, according to the Ookla Global Speed Test Index. The country surpassed Qatar and is now just behind South Korea in the mobile broadband speed test. Last month, Qatar ranked second and now ranks third in December. The overall average download speed is 32.01Mbps in December, while the upload speed is 12.02Mbps. In the UAE, the average download speed is 86.77Mbps while the upload speed is 25.55Mbps. In November, the average download speed in the UAE was 69.72Mbps while the upload speed was 21.85Mbps. The global speed test compares Internet speed data from around the world every month. The data for the index comes from the hundreds of millions of tests performed by real people who use the speed test every month. In December, the average download speed in South Korea was 103.18Mbps and 20.55Mbps in upload speed. Compared to other Gulf Cooperation countries, Saudi Arabia ranks second in 13th place with a download speed of 55.58Mbps, Kuwait jumped six places higher to 28 with a

download speed of 46.52Mbps, Oman moved four places down to 33rd with a download speed of 42.97 Mbps, while Bahrain jumped higher than 47 with a download speed of 35.64 Mbps. In fixed broadband space, the UAE lost a lower place to 30 with an average download speed of 90.57Mbps, while the average loading speed is 38.78Mbps. The overall average download speed improved from 71.55Mbps in November to 73.58Mbps in December, while the upload speed was 40.39Mbps in December compared to 38.91Mbps in November. The three main countries are Singapore, Hong Kong and Monaco. In Singapore, the average download speed is 200.12Mbps, while it is 164.88Mbps in Hong Kong and 148.91Mbps in Monaco. Compared to other Gulf Cooperation countries, Qatar jumped one place higher to 40th with a download speed of 73.94Mbps, followed by Kuwait jumped five places to 44 with a download speed of 65.92Mbps, Saudi Arabia jumped two places higher to 53º with 52.93 Mbps, Oman jumped 20 places higher to 66º with 42.22Mbps, Bahrain fell three places lower to 95º with 26.98Mbps.

Mobile

Global Average

↓ Download
32.01 Mbps

↑ Upload
12.02 Mbps

12 / 2018 — 12 / 2019

#		Country	↓ Mbps
1	-	South Korea	103.18
2	+2	United Arab Emirates	86.77
3	-1	Qatar	79.21
4	+2	Canada	70.74
5	+4	China	67.71

Pakistan Grants Jazz, Zong 5G Trial Licenses

The Pakistan Telecommunication Authority (PTA) issued six-month 5G test licenses to mobile operators Jazz and Zong, allowing them to conduct limited trials on a non-commercial basis. PTA allocated spectrum in the 2.6GHz band with Jazz, the market leader by subscribers, and third-ranked Zong already commencing

trials, local media reported. In June 2019, PTA published a framework for 5G testing and development to pave the way for trials to start this year. The Pakistan government hasn't announced when it will grant the necessary regulatory approvals for the commercial launch of 5G services, but the Ministry of Information Technology and

Telecommunication recently set up an advisory committee to define the terms for an auction of compatible spectrum. Representatives from the IT Ministry, PTA, Prime Minister's office, Frequency Allocation Board and the country's four mobile operators will sit on the committee.

UAE Launches the National Cybersecurity Capacity Building Program

The General Authority for Regulating the Telecommunications Sector TRA launched the National Cybersecurity Capacity Building Program, a core program within the National Cybersecurity Strategy. The Program aims to develop highly efficient national capabilities in protecting the cyberspace and addressing relevant risks. The Program also aims to develop the capabilities of youth in Cybersecurity, whether professionals or those working in areas related to IT and Computing, or students and amateurs, thus contributing to enhancing the readiness of UAE to respond to cyber incidents and supporting research and innovation, while safeguarding the digital infrastructure of the country. Commenting on this Program, H.E. Hamad Obaid Al Mansouri, TRA Director General, said: "As we steadily move towards shaping a digital future that promotes community happiness, we take into account the side effects of digital technologies, especially cyber risks affecting infrastructures and information security. In this context, the TRA has launched the National Cybersecurity Strategy with a view to promoting and maintaining the rapid progress witnessed in the UAE in areas of Artificial Intelligence, Big Data and the Fourth Industrial Revolution, driven by the strong momentum generated by a history of pioneering and key milestones. With the year 2020, we started the actual implementation of this Strategy by launching the National Cybersecurity Capacity Building Program, given that smart cities we aspire to in the future primarily need human cadres capable of protecting such cities from cyber attacks. Therefore, the challenge ahead is not only to reach great achievements but also to be able to preserve these achievements." H.E. Al Mansoori stressed that youth are the cornerstone for achieving the visions of the country and protecting its accomplishments, adding: "Future wars will not rely on conventional weapons. Rather, they would be wars of computers and experts capable of hacking into and destroying digital infrastructures with a push of a button. Future destruction will not be physical destruction, but rather a disruption of tasks and services and creation of chaos and panic, and in order to protect our nation from such events, it had become imperative to prepare youth who are able to counter cyber-attacks, and find weaknesses in our digital systems. Today, through this Program, which comes in response to the directives of our wise leadership to strengthen the role of youth, we are striving to protect our gains in areas of Artificial Intelligence, Big Data and the Fourth Industrial Revolution." In achieving its goals, the National Cybersecurity Capacity Building Program bases itself on four pillars, including: Competency framework, academic support, training courses and events. The Competency Framework defines Cybersecurity functions, tasks, information and skills that incumbents should have. The Framework also identifies training courses that can be offered to Cybersecurity jobholders and other related jobs, to enhance their abilities and competencies. The Competency Framework also seeks to bridge the gap between educational outcomes and the labor market by helping universities develop educational programs to meet the requirements of the labor market. This Framework outlines the basic skills that graduates must possess in order to be able to fill Cybersecurity jobs. It also assists HR officers in UAE organizations

in selecting Cybersecurity employees by defining the tasks and skills assigned to each post and training requirements for HR development in the field of Cybersecurity. Academic support is the second focal point of the Program, through which it aims to educate school students about Cybersecurity in general and relevant career opportunities through awareness workshops by the TRA, and through the Cybersecurity awareness page on its website. Moreover, the Program will, in cooperation with relevant entities, include cybersecurity in UAE school curricula and Cybersecurity majors and courses in universities, while encouraging universities to include Cybersecurity in all disciplines related to information technology (e.g. programming, networking, etc.) to allow graduates to obtain a sound grounding in Cybersecurity. Under its third pillar, the Program strengthens competencies through a number of initiatives and training programs to be launched by the TRA in the near future, in collaboration with its strategic partners. The Program will provide Cybersecurity training to three categories: students and amateurs, Information Technology workers and Cybersecurity professionals. Under its fourth pillar, the National Cybersecurity Capacity Building Program will organize and support Cybersecurity conferences and events, where a national Cybersecurity conference is planned to be held, as well as supporting and participating in all Cybersecurity-related events. The Program also includes simulation exercises to respond to cyber incidents for increased readiness of specialists in addressing and redressing the same. The TRA has launched the UAE National Cybersecurity Strategy as the country is entering the 5G era, where the TRA is developing and launching the UAE 5G Strategy 2020-2025, making the UAE the first in the region to launch such strategy beyond 2020. The new National Cybersecurity Strategy strengthens the integrated Cybersecurity system by implementing 60 initiatives across 5 themes.

Bahrain Leads Middle East in Cyber Security

Bahrain has the best electronic system to run security operations in the Middle East, said Public Security deputy chief Dr Shaikh Hamad bin Mohammed Al Khalifa. He stressed the Interior Ministry's strides to enhance security and safety and keep abreast of cutting-edge technology in combating fast-shifting crime and the malicious use of technology for heinous purposes. Speaking during the weekly Al Amn program aired on Bahrain TV, he said Bahrain is safe, as reflected in the high-security indicator. He said the ministry has a comprehensive electronic system to monitor security patrols and deal with developments efficiently. "We have a network of smart camera system covering all areas of Bahrain which enables us to respond quickly to any development," he said. "At the touch of a button and through a unified screen, we dispatch ambulances, traffic patrols and firefighting units at the same time," he said. He said work is underway to enhance artificial intelligence systems of individuals and vehicles, stressing the importance of incorporating the latest technologies and ensuring readiness to deal with emergencies.

Pakistan's InstaCare Raises US$140,000 for Its Digital Healthcare Platform

Lahore-based healthtech startup InstaCare has raised ~$140,000 (PKR 22 million) investment from Khaleef Technologies, a Pakistani technology company, the startup announced in a statement to MENAbytes. Founded in 2018 by Bilal Amjad, Ayesha Siddiq, and Ahmad Amjad, InstaCare's web and mobile-based healthtech platform allows users to book appointments with doctors and labs (for different tests) and order medicines. The platform also allows users to save and access their medical records whenever needed. Ayesha Siddiq, the co-founder and Chief Operating Officer of InstaCare, in a conversation with MENAbytes, said that they have over 20,000 doctors on the platform. She also said that they are delivering prescription medicines all over Pakistan. We could not confirm if they're doing this by partnering with pharmacies. In addition to these services, InstaCare also sells subscription-based practice management software to doctors, medical centers, hospitals (and even gyms) across Pakistan. There are multiple players operating in this space in Pakistan already. Oladoc, for example, specializes in doctor bookings and has raised over a million dollar in funding. Healthwire, another Pakistani startup sells practice management software. Ayesha, commenting on the competition, said that they're working to digitize the entire health ecosystem and that's what makes them different, "We are striving to make our healthcare ecosystem efficient, reliable and accessible. Services like booking appointments, lab tests, and medicines are just a few components of InstaCare." Bilal Amjad, co-founder and CEO of InstaCare, in a statement, said, "We are motivated and excited about the investment made by Khaleef Technologies. It will definitely play a vital role in making our healthcare ecosystem more accessible, affordable and reliable." Ahmed Hanif, CEO of Khaleef Technologies, said, "We see a bright future for Instacare and believe that electronically enabled healthcare is going mainstream while touching the lives of millions of people globally." The startup said that the investment will enable it to spread its reach across major cities of the country and provide access to quality healthcare "while disrupting the conventional healthcare system through intelligent automation."

Tunisia to Launch SMS Disaster Alert System

The Government of Tunisia is collaborating with the country's mobile operators to develop an SMS-based early warning system to alert citizens at risk of major natural disasters. The new service forms part of the launch of the GSMA's 'We Care' initiative in Tunisia by local operators Ooredoo, Orange and Tunisie Telecom, marking the first launch of We Care in the Middle East and North Africa (MENA) region. The initiative is a collaboration with the Tunisian Ministry of Interior and the Tunisian Ministry of Technologies of Communication and Digital Economy. "The GSMA is delighted to be working in collaboration with the Tunisian government and the country's mobile ecosystem on the successful launch of 'We Care' in Tunisia. The new SMS alert system is a great demonstration of how industry players can work together to enable mobile technology to play a vital role in protecting citizens," said Jawad Abbassi, Head of MENA region, GSMA. Tunisia regularly suffers from flooding disasters, often following torrential rains, which in some cases causes loss of life, as well as serious material damage. In September 2018, severe weather in Tunisia's Cap Bon peninsula caused human casualties

and property damage. In response to such events, the new service will use an SMS alert mechanism to provide instant targeted information before and during major natural disasters, improving disaster preparedness and response. When a major risk is identified, the Ministry of Interior will send notifications to the mobile operators based on recommendations from the National or Regional Natural Disaster Committees. These notifications will include the content of the alert to be broadcast and the location of the area concerned. The operators will then send an appropriate SMS alert to citizens in the affected areas. The service is expected to be in place before the next rainy season of 2020, likely to begin in September. "Our citizens are increasingly demanding reliable, accurate and timely information during the floods. This is why it is essential for us to have a public alert system based on digital solutions that will be accessible to everyone," said His Excellency Mohamed Anouar Maarouf, Minister of Communication Technologies and the Digital Economy. In 2016 the mobile industry became one of the first sectors in the world to commit to the UN Sustainable Development Goals. Since then around 400 million new people have started using mobile and more than 860 million have started accessing mobile internet services. "The health and safety of our customers and all Tunisian citizens is one of the top priorities for a socially responsible operator such as Ooredoo.

This is why we have put at their disposal all our direct and targeted means of communication, and why we have joined forces with the Ministry of Technologies, Communication and Digital Economy, the Ministry of the Interior and all the various stakeholders to support this We Care project," Mansoor Rashid Al Khater, CEO, Ooredoo Tunisia said. Through the GSMA's We Care initiative, operators around the world are taking steps to ensure their customers can enjoy the transformative benefits of mobile technology in a safe and reliable environment. These in-country projects support the mobile industry's commitment to the SDGs, allowing operators to drive impact at a local level. Driven by operators, together with the GSMA, We Care initiatives address ten key areas: digital inclusion; children and mobile; environmental care; disaster response; SMS spam control; mobile privacy; mobile and health; infrastructure deployment; contribution to public safety; and handset theft. "Orange Tunisia is committed to doing everything we can to ensure a safe environment for our Tunisian customers. The launch of the new SMS alert system could potentially save lives in the event of a disaster, so we are working with the government to implement it as soon as possible," said Thierry Millet, CEO, Orange Tunisia. The first We Care initiative was launched in February 2014. To date, there are 30 We Care projects running in 21 markets worldwide, in collaboration with 70 mobile operators.

OFT Signs Deal to Lease Mobile Towers of Oman Tower Company

Oman Future Telecommunications (OFT), the Sultanate's third mobile network operator (MNO) licensee, has signed an agreement to lease the mobile communication towers of Oman Tower Company to enable it to launch wireless services in the country. The OFT consortium secured Oman's third MNO

license in October 2017 and went on to sign a strategic partnership agreement with Vodafone Group in September 2019. Under the 15-year non-equity agreement, Vodafone and OFT will work together to roll out a new network and develop a number of new services using the Vodafone brand in Oman. A commercial launch planned

for the second half of 2020. Founded in February 2018, Oman Tower Company is responsible for building, operating and leasing telecoms towers and associated infrastructure to be used by licensed operators on an open access basis.

CMPak Invested Over US$5 Billion in Telecom Sector of Pakistan

China Mobile Pakistan (CMPak) had invested around US $ 3 billion in the telecommunication sector of Pakistan along with other investments in infrastructure worth over US $ 2 billion. CMPak had made some massive contributions for the economic development of Pakistan with Rs 134 billion taxes paid in the last 12 years, a press release received here said. The taxes being paid included Activation Tax, Custom Duty, Income Tax, Sales Tax, AIT, WHT, Payroll Tax, Royalty to PTA, Stamp Duty, etc whereas the company had generated over 3,500 direct and over 200,000 indirect employments. Moreover, CMPak had the commitment to leading Pakistan's Digital Revolution by continuing to reinvest all earned revenues in Pakistan whereas the Consumers Association of Pakistan (CAP) awarded ZonG 4G of CMPAK for best services in country. "ZonG 4G wins the "Best 4G Services" in Pakistan award at the 3rd

Consumers IT and Telecom Conference, organized by Consumers Association of Pakistan (CAP), with support from Ministry for Information Technology and Telecommunication and Pakistan Telecommunication Authority (PTA)," it added. PTA had also awarded ZonG 4G for 10 years of Service Excellence and presented a token of appreciation to Chairman and CEO ZonG 4G Wang Hua in recognition for 10 years of Excellence whereas CAP Awarded Zong " Leadership in Innovation". Zong 4G had won "Leadership in Innovation" and was awarded "CEO of the Year" in October 2019 by CAP based on its leadership and innovation in technology. In August 2019 Zong became the first operator to successfully test its 5G network in South Asia. Zong is ready for all future technology and has the right set of technological prowess and financial muscle to acquire and implement new digital technology solutions. With the

backing of a strong group in the form of China Mobile (CMCC) Zong works closely in collaboration with the Pakistani government. Zong envisions a Pakistan which technologically and economically prosperous. China Mobile Pakistan (CMPak) was a 100 percent owned subsidiary of China Mobile Communications Corporation. The pioneering overseas set up of China Mobile came through acquisition of a license from Millicom to operate a GSM network in Pakistan.

UAE Telecom Regulatory Authority Warns Public of a Computer Virus Spreading Fraudulent Links

The Telecommunications Regulatory Authority (TRA) has warned the public against a worldwide virus outbreak that goes by the name of 'Emotet'. The virus is a malicious system that spreads malware and infects users through its bulk spam email campaigns containing harmful links to users. Emotet first emerged in 2014, originally designed as a banking malware that attempted to sneak onto an individual's computer and steal sensitive and private information. Later versions of the software saw the addition of spamming. The TRA also warned the public of the risk of fraudulent messages that mislead recipients into thinking that they are from reliable sources and invite them to click on certain links or send private information by phone, email or otherwise, ultimately making the recipient a victim of scam and online fraud. A widespread of fraudulent messages containing links have been recently detected. Such message reach users via SMS and WhatsApp, impersonating a well-known company or bank established in the UAE, which then ask the user to call some numbers, provide personal data and bank card details, under the pretext of unblocking the ATM card. Users become victims of fraud and theft due to lack of awareness of such methods used in the attack.

Augmented Reality and Virtual Reality to Add US$4.1 Billion to UAE Economy by 2030

Augmented reality and virtual reality will together pump $4.1 billion (Dh15.05bn) into the UAE economy by 2030, boosting the country's gross domestic product by 1 per cent, according to a new study by consultancy PwC. AR and VR will also have a significant impact on employment in the UAE, helping to create more than 42,000 jobs in the country over the next ten years. "AR and VR technologies will improve how organizations in the country operate, make for a seamless transition to more effective processes… educate people more effectively and generate incredible user experiences," said Ali Al Hosseini, chief digital officer at PwC Middle East. Globally, AR and VR are expected to contribute $1.5 trillion to the economy by 2030, PwC said. Finland ($7.8bn), Germany ($103.6bn) and the UK ($69.3bn) are set to see the biggest impact from AR and VR on their economies, with the technology adding 2.64 per cent, 2.46 per cent and 2.44 per cent respectively to their GDP by 2030. The UAE will see a 0.95 per cent increase in GDP from AR and VR by 2030, the study said. AR enhances real world situations using digital capabilities. It also lets users interact with other people while accessing digital information, such as reading text messages and operating navigation apps. In VR, users wear headsets with high-resolution lenses. It is currently used for gaming and immersive video, offering users an experience that is different from the real or physical world. Tech companies are investing heavily in these sectors. Apple has about 1,000 engineers developing products based on these technologies and aims to release a combined AR and VR headset with a focus on gaming, video and virtual meetings within the next couple of years. "AR and VR are transforming the world we live in and we have only seen a fraction of what is possible," said Richard Boxshall, senior economist at PwC Middle East. In the UAE, these technologies can deliver experiences "unlike any other and will make businesses thrive with the right adoption", said Mr Boxshall.

Bangladesh to Export Bandwidth to Nepal

Bangladesh Submarine Cable Company (BSCCL) is looking for new markets to export its huge unused bandwidth and the new destination is Nepal, said officials of the state-owned listed firm. The lone submarine cable company of Bangladesh is now in talks with Nepal Telecom to export about 100 gigabits per second (Gbps) of bandwidth. A memorandum of understanding will be signed within a short time, Mashiur Rahman, managing director of the BSCCL, told The Daily Star recently. "Discussions have been ongoing for a long time and now we are ready to ink the deal," said Rahman. As Bangladesh has access to the landlocked Himalayan nation only via India, BSCCL and Nepal Telecom have approached an Indian company, which has expressed willingness to establish the connection, he said. "So, before finalizing the deal we will also have to sign a tripartite agreement." Nepal now buys bandwidth from Chennai in India and China to meet its daily demand for about 250 Gbps, but due to its remote location high-speed internet cannot be ensured, Rahman said. The BSCCL's second undersea cable lands in Kuakata of Patuakhali, which is closer to Nepal. "This is why Nepal has come to us," he added. Bangladesh has 2,600 Gbps bandwidth capacity from two submarine cables, but only 900 Gbps is consumed locally. BSCCL is working to get its third undersea cable by 2023, which alone will add another 7,200 Gbps. BSCCL is currently exporting 10 Gbps of bandwidth to India's northeastern state of Tripura though their state-run telecom company Bharat Sanchar Nigam Ltd (BSNL). But BSNL does not afford internet bandwidth from Bangladesh anymore and will suspend its deal next month. Bandwidth export to Tripura had begun on February 8, 2016. Initially, the price was $10 per Mbps and BSCCL earned Tk 9.6 crore in the first year. Later, the price was revised down twice to bring it to $6 per Mbps. Still, BSNL has been unable to pay dues since September 2018. The Indian company owes Tk 6.39 crore to BSCCL, which is no closer to recouping the dues. Rahman, however, said some other remote Indian states are eager to buy bandwidth from them. Bangladesh earlier had taken an initiative to export bandwidth to Bhutan, another landlocked neighbor, but the plan did not come to fruition as India did not join in. BSCCL's shares closed at Tk 100 on the Dhaka Stock Exchange yesterday, up 7.53 per cent from the previous day.

Saudi Telecom Sector on Growth Track

The telecom sector in Saudi Arabia witnessed a healthy performance in 2019 so far, a report said, noting that leading telecom companies have registered increase in revenue year-to-date (YTD). Saudi Telecommunications Company (stc) recorded an increase of 6 per cent year-on-year (y-o-y) while the revenues of Mobily was up 14 per cent y-o-y and Zain KSA up 12 per cent y-o-y, mainly led by low base, improved ICT/business segment and improvement in ARPU, said the Saudi Telecom Report released by Al Rajhi Capital, a leading financial services provider in the kingdom. Going into the fourth quarter (Q4) of 2019 and 2020, there are reasons to be optimistic as there is now stability in number of expats, higher number of business/tourist visitors expected, increased business activities locally, further growth expected in business segment and increase in prices. On the other hand, investment in 5G in 2020 could mean higher costs & capex, the report said, adding that this implies stc Group is unlikely to pay special dividends in 2019/2020 if it does not receive payment for receivables. "While Zain is aggressive on 5G, we believe Mobily is likely to focus on debt repayments. We present the key trends in the space. Our target price for stc Group is SR91 ($24.2)/share based on equal mix of DCF and 7.5x EV/EBITDA multiple. For Mobily and Zain based on valuation multiple of 6x and 6.3x respectively, we arrive at target prices of SR24/share and SR13/share respectively," Al Rajhi Capital said in the report.

Middle Eastern Cybersecurity Market Set to Grow in 2020

With the Middle East cybersecurity market expected to grow at a compound annual growth rate of 22.5 per cent during 2018-24, Honeywell's cybersecurity professionals shared insights and expected changes resulting from more open, connected and smart building systems. Here are key 2020 predictions from the company:

Buildings will likely see an increase in cyber-related threats as they become more connected, putting data and reputation at potentially greater risk. According to Gartner, buildings will account for 81 per cent of all connected things in 2020. Still, connected buildings often remain a less-guarded entry point and cybersecurity has oftentimes not been a primary focus when managing operational technology. Cybersecurity for operational technology is expected to become a key safety and security metric for many businesses in 2020 as digitalisation and the interconnectivity of systems potentially opens up new routes of access for cyberattacks. As buildings become smarter, they generally produce more and more connected data, and therefore oftentimes attract more potential threats. In fact, a CEB study found that nearly 20 per cent of organisations with IoT networks have experienced at least one IoT-related attack already. As businesses experience more attacks and the resulting damage caused, many will likely develop new and more robust strategies to keep pace. Honeywell expects to see more preventative measures in the coming year, such as training focused on addressing potential cyber threats in operational technology and on conducting cybersecurity assessments to identify gaps. Demand is expected to increase for a new type of security professional as operational technology and IT responsibilities often overlap. By 2021, IoT security service spending will more than double to nearly $2.1 billion, according to Gartner. As cyber threats evolve and the demand for operational technology cybersecurity grows, the role of the security professional is often changing. Operational technology and IT functions have been increasingly working together to prepare for and respond to cyber-attacks, but in 2020 the industry will likely see more individual professionals with both operational technology and IT capabilities. These employees typically start their career in one function, but grow their skillset overtime as they gain more overarching security experience. A global standard for cybersecurity is expected to become a top priority across industries. This year will likely bring a greater focus to standardization for building cybersecurity, and we expect to see at least one framework emerge as a leading guide for securing a building's OT system.

New Approaches Needed to Ensure Connectivity for Everyone - An Overview

In today's digital era, the role of broadband – and the benefits of broadband connectivity – in driving and underpinning a country's progress have never been greater and have never been more clearly measurable: fixed and mobile broadband contribute to economic growth, which numerous studies have examined, including a recent study by ITU on the impact of broadband, digital transformation and the interplay of ICT regulation and national economies.

Connecting everyone as a precondition for an inclusive digital society

The Internet has the potential to positively impact and transform people's lives and bring benefits in a great number of areas, including health, education, financial services, transport, energy, agriculture, and more. As highlighted in the most recent UN Broadband Commission's "State of Broadband Report 2019"[1], in today's digital era, the role of broadband – and the benefits of broadband connectivity – in driving and underpinning a country's progress have never been greater and have never been more clearly measurable: fixed and mobile broadband contribute to economic growth, which numerous studies have examined,[2] including a recent study by ITU[3] on the impact of broadband, digital transformation and the interplay of ICT regulation and national economies. The study shows that an increase of 1 per cent in fixed broadband penetration yields an increase of 0.08 per cent in GDP, and an increase of 1 per cent in mobile broadband penetration yields an increase of 0.15 per cent.[4]

Imme Philbeck
Chief Economist and Director of Sector Development
SAMENA Telecommunications Council

[1] See: State of Broadband Report 2019: Geneva: International Telecommunication Union and United Nations Educational, Scientific and Cultural Organization, 2019. Licence: CC BY-NC-SA 3.0 IGO, https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROADBAND.20-2019-PDF-E.pdf
[2] See: https://broadbandcommission.org/Documents/publications/davos-discussion-paper-jan2016.pdf
[3] See: https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/FINAL_1d_18-00513_Broadband-and-Digital-Transformation-E.pdf
[4] The analysis also establishes, that generally mobile broadband appears to have a higher economic impact than fixed broadband, and that the impact is greater in less developed countries than in more developed countries.

Figure 1: Economic impact of broadband worldwide, 2010-2017
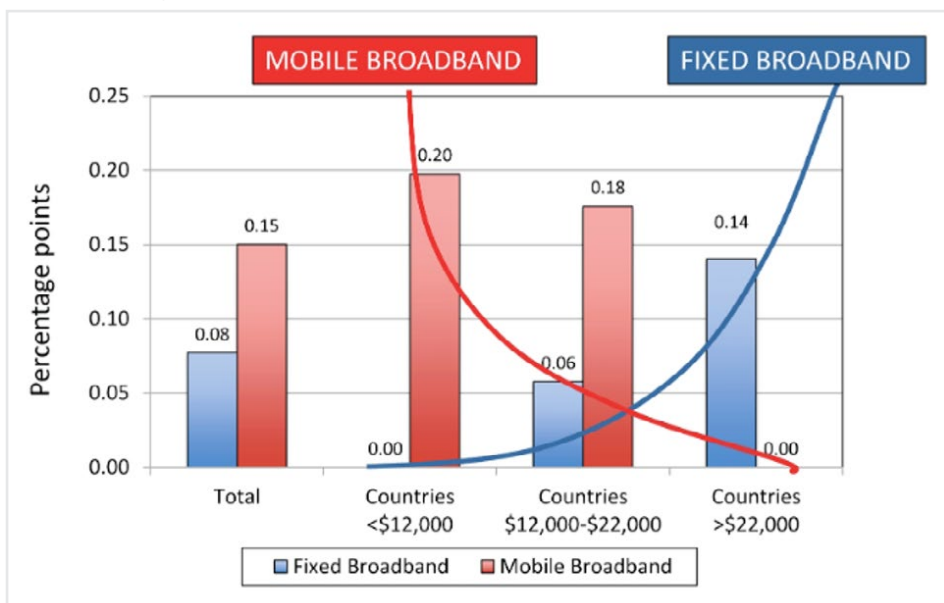
Note: Values expressed as impact on GDP of 1 per cent increase in broadband penetration
Source: ITU research

Network operators traditionally, and other industry players more recently have undertaken considerable efforts in expanding infrastructure and services. However, to date 47% of the world's population is still offline, with the majority located in Africa and Asia-Pacific, that cannot participate and share in the benefits that the digital revolution brings, thereby impeding digital transformation.

The reasons for being offline or for limited Internet use are manifold: about 1 billion still do not have access because they live in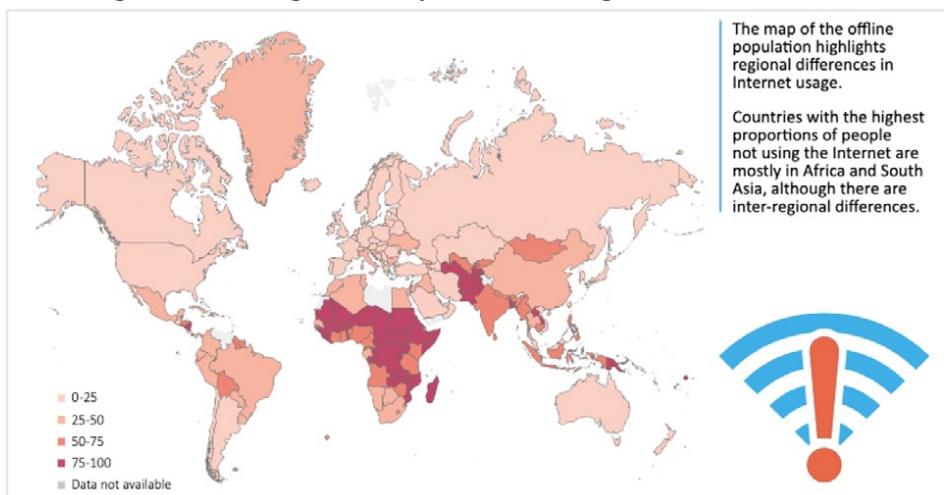 remote or difficult-to-reach areas that are uneconomical to cover with broadband and often other basic infrastructure such as electricity or transport. For these a funding gap exists. The common consensus is that the traditional business models of telecoms services, often limited to revenue-cost recovery, simply do not result in an economically viable opportunity to connect the unconnected. Moreover, consumer adoption, accessibility and affordability are still critical challenges, consequently impeding take-up of service, revenue generation and return on investments: About 2.7 billion that are within coverage range do not see the benefits of being connected, often because of limited awareness, cultural impediments or limited relevant digital content; or because they are illiterate and too poor to afford even the most basic of Internet packages and devices. Existing inequalities in terms of income and education, particularly prominent among women, and other factors exacerbate the problem. Thus, funding is a crucial issue to address – both in terms of infrastructure and in terms of meaningful engagement with the Internet and digital economy where coverage is available.

This article briefly looks at the rationale for broadband, why current funding and investment approaches are failing and why they cause tensions with new cross-border business models employed by different digital ecosystem stakeholders, and the need for new funding and investment approaches.

> *The common consensus is that the traditional business models of telecoms services, often limited to revenue-cost recovery, simply do not result in an economically viable opportunity to connect the unconnected.*

Broadband access and connectivity as the enabler of the economy
Broadband networks are an increasingly integral part of the economy, which, as the OECD termed it in its Final Report 2015 "Addressing the Tax Challenges of the Digital Economy", has become the digitalized economy that can no longer be ring-fenced. Broadband networks are the fundament that can facilitate the development of new inventions, new and improved goods and services, new processes, new business models, and increase competitiveness and flexibility in the economy. More generally, broadband networks and broadband connectivity can enable the scaling and improved performance of ICTs (and 4IR

Figure 2: Percentage of the Population not using the Internet 2019∗, ITU

The map of the offline population highlights regional differences in Internet usage.

Countries with the highest proportions of people not using the Internet are mostly in Africa and South Asia, although there are inter-regional differences.

Note: ∗ ITU estimate
Source: ITU

technologies), which are considered to be general-purpose technologies ("GPT") that fundamentally change how and where economic activity is organized. As technologies evolve and bandwidths increase, the scope for broadband to act as an enabler of structural change in the economy expands as it affects an increasing number of sectors and activities. It can therefore also be recognized as a cross-sectoral enabler, underpinning national efforts to develop knowledge economies, fostering digital transformation in government services and digital transition across all sectors, expanding opportunities for enterprises and providing greater value for citizens and consumers. This is evident in the number of national digital economy efforts linking broadband connectivity to sectoral initiatives, including the delivery of quality education, the promotion of social inclusion and the benefits that accrue specifically in rural and remote regions. Direct effects result from investments in the technology and from rolling out the infrastructure. Indirect effects come from broadband impact on factors driving growth, such as innovation, firm efficiency, competition and globalization.

As such, significant impacts on the economy can be expected from enhanced broadband development, by enabling organizational change and enhancing coordination to reap productivity gains from overall investments in ICTs. Furthermore, compared to other historical GPTs, such as railways and electricity, the impact of Broadband and ICT may be larger and materialize more rapidly due to scale and network effects. High speed, ubiquitous broadband internet connectivity therefore is the critical enabler for digital ecosystems that are necessary components of programmes aimed at development, economic transformation and income growth. It is the foundation and pre-condition for digital transformation of the economy and society and therefore may be considered as an essential utility, alongside other utilities such as road, water, electricity and gas. Moreover, the UN since July 2016 considers access to the Internet a basic human right.

What is Broadband?
The definition of broadband across countries continues to evolve as technologies improve, new generations emerge of wireline and wireless broadband and baseline expectations continue to be raised of what constitutes minimum download speeds for the optimal end-user experience. Therefore, as defined by the European Commission, the term "Broadband" does not refer to a particular technology used for Internet access but represents a term for a digital infrastructure that allows for high-speed internet access that is always on and that is faster than traditional dial-up access. The Commission defines three categories of download speeds as follows:

- 'Basic broadband' for speeds between 144 Kbps and 30 Mbps;
- 'Fast broadband' for speeds between 30 and 100 Mbps; and
- 'Ultra-fast broadband' for speeds higher than 100 Mbps.

A broadband network generally comprises three main elements, including the backbone or core network, the middle mile and the last mile. The World Bank also identifies an "invisible mile"[5], which includes the network components that are not visible, including the radio spectrum, network databases (for example, for numbering), cybersecurity, and so on, but can also include potential bottlenecks such as market concentration, multilayered taxation of activities, lack of access to rights-of-way, and inefficient regulations including transborder regulatory issues.
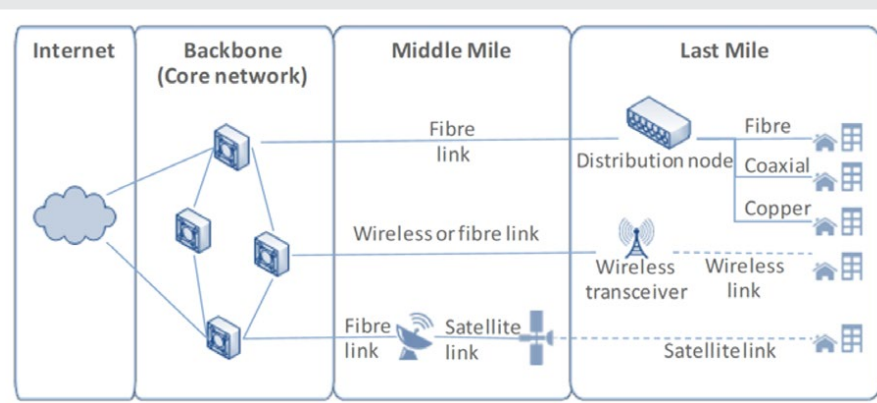
Source: Special Report No 12: Broadband in the EU Member States: despite progress, not all the Europe 2020 targets will be met, European Court of Auditors[6]

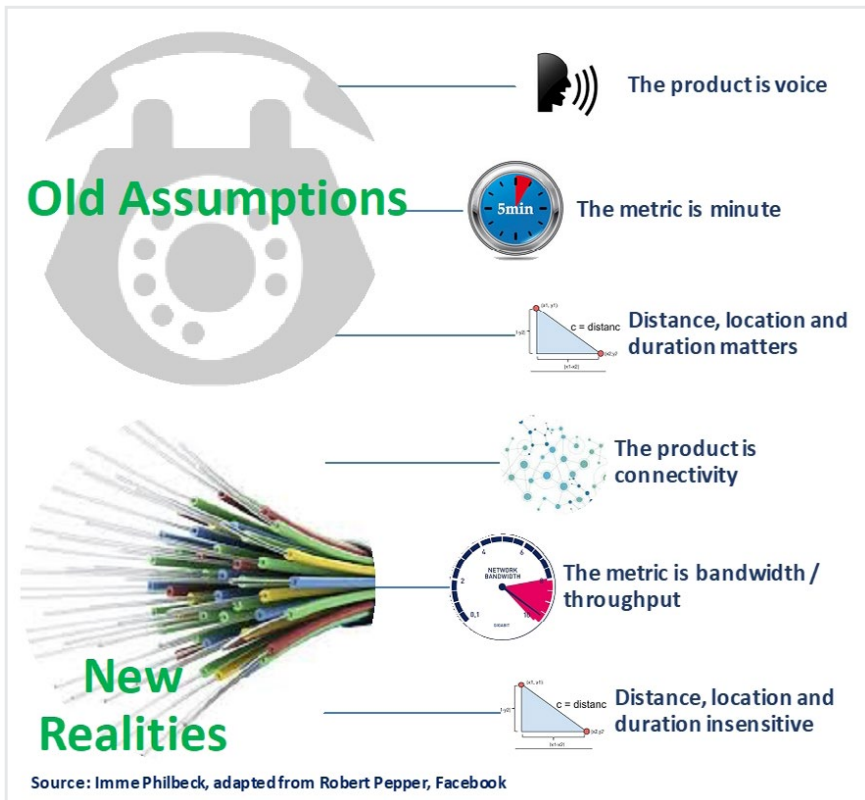**Why traditional funding and investment approaches are failing**
Network operators as well as governments and regulators in many parts of the world - keen to share in and realize the benefits of the digital revolution - are still grappling with adapting to an all-IP environment, which has brought great disruption to the old ecosystem of telecommunications and corresponding regulatory frameworks by uncoupling services from networks. Old assumptions of voice as the product, minutes as the metric, and the importance of distance, duration and location do no longer hold and have to make way for new realities, where the product is cross-border connectivity, the metric is bandwidth / throughput and where distance, time and location do not matter.

Customers no longer demand and buy dedicated telecommunication services from a dedicated telecommunications network and service provider. Instead, they buy an Internet connection from a national network operator that is regulated at the national level, to access a wide range of often perceived as «free» content, apps and services that have proliferated as a key means of local and cross-border communication (and more). These are offered by alternative, and often global internet platforms and companies mostly

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[5] See: UN Broadband Commission Working Group Report 2019 "Connecting Africa Through Broadband: A strategy for doubling connectivity by 2021 and reaching universal access by 2030"
[6] See: https://www.eurosai.org/en/databases/audits/Broadband-in-the-EU-Member-States-despite-progress-not-all-the-Europe-2020-targets-will-be-met/

Figure 3: Old Assumptions, new realities

Source: Imme Philbeck, adapted from Robert Pepper, Facebook

creating challenges and tensions in relation to current national regulatory frameworks within which national network operators operate, as well as creating implications for taxation, security and privacy. An added challenge arises in the context of developing countries, where many population segments have limited disposable income. Current business models and certain network operator practices in service pricing have been insufficient to provide the investment necessary to bring coverage to many of these populations. Moreover, Governments do not have the revenues, models, expertise or structures to fund 100% of the development of networks. In addition, international financial institutions such as the World Bank, which typically funds development projects, cannot close the funding gap for every ICT project. Furthermore, traditional USF models may not provide comprehensive solutions as these, by definition, are designed to take USF contributions only from nationally licensed network operators and issue grants to operators to build infrastructure in under-served areas. Such funding and existing means of distribution, however, are often grossly insufficient to fund this coverage gap. There is a need to examine ways to augment and expand on the current financing and investment models.

New approaches to funding and investment are required

Given the tensions between traditional financing, investment and corresponding business models and new digital cross-border market and supply practices, coupled with outdated regulatory models and the continuing prevalence of national borders and networks, new approaches

located outside of the consumption country. This has impacted network operators' revenues, coupled with intense price competition on data packages fueled by the perception of broadband as a utility and growing pressures to increase network capex spending to enable the delivery of more and increasingly complex and high-bandwidth content. A 2019 report by

Analysys Mason estimates that mobile capital intensity will only increase from 13.2% to 16.3% between 2018 and 2025.[7]
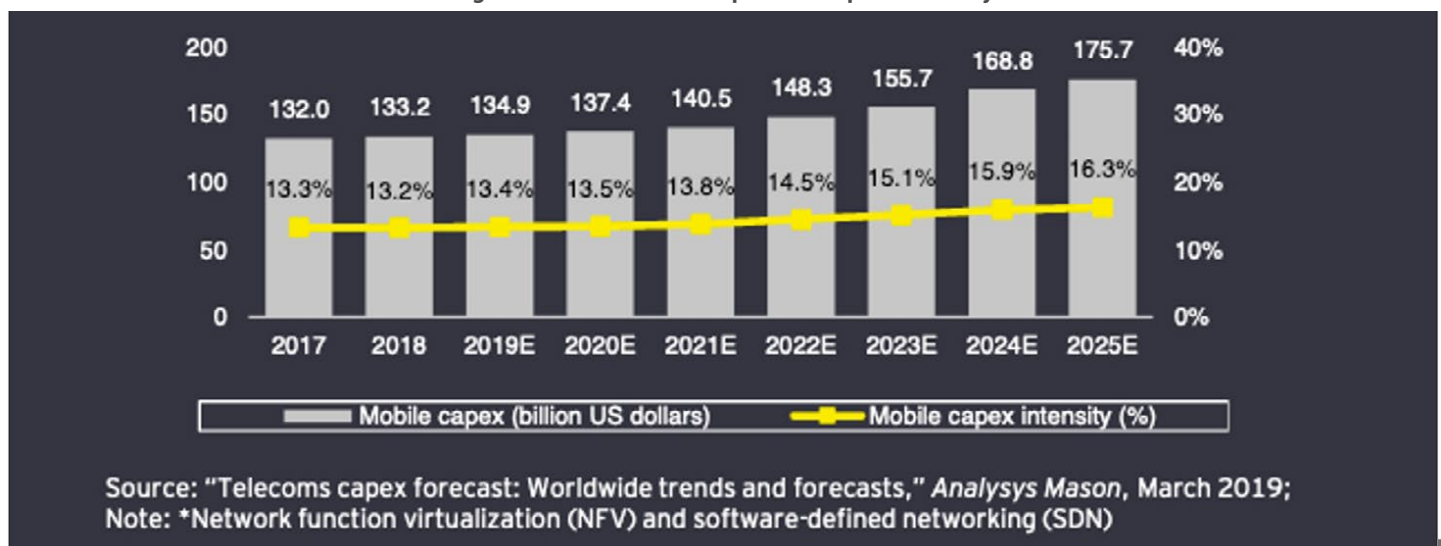
Digital transformation has also impacted governments and regulators who no longer have jurisdiction over communication service providers that have substituted local services,

Figure 4: Global mobile capex and capital intensity

Source: "Telecoms capex forecast: Worldwide trends and forecasts," *Analysys Mason*, March 2019;
Note: *Network function virtualization (NFV) and software-defined networking (SDN)

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[7] See: https://www.ey.com/Publication/vwLUAssets/ey-accelerating-the-intelligent-enterprise/$FILE/ey-accelerating-the-intelligent-enterprise.pdf and original source "Telecoms capex forecast: Worldwide trends and forecasts," AnalysysMason, March 2019

Broadband Technology Development
- **Hybrid internet solutions** combine the copper phone network and the 4G mobile network to increase speed to customers, using a specific gateway (a type of modem). This solution is already in use in Belgium and the Netherlands with speeds of 30 Mbps in previously under-served areas.
- **The satellite industry** is currently delivering the next-generation satellite broadband. Two recent innovations are the high-throughput satellites and the non-geostationary orbit satellites. By using these types of satellites, connections over 30 Mbps may be offered in the future to a larger number of rural or remote customers.
- **5G,** 5th generation mobile networks are the next wireless telecommunications standards. 5G planning aims at higher capacity than current 4G, allowing a higher density of mobile broadband users, and supporting device-to-device, more reliable, and massive machine-to-machine communications. 5G has three elements: (1) enhanced mobile broadband, (2) massive Internet of Things, (3) mission critical services (such as self-driving cars). 5G requires a middle mile infrastructure based on fibre making 5G a complement to, but not a replacement for, high speed broadband networks close to the end user.
- **Fixed Wireless Access in the 5G context** can be an efficient and more cost-effective means of connecting the unconnected also in those areas that are less economical and hard-to-reach. 5G FWA retains the key benefit of current FWA offerings in that it enables the establishment of a quick and cheap broadband service, even in areas that don't have ready access to fixed line home broadband. 5G FWA doesn't require any engineering works at the customer end - just the provision of so-called Customer Premise Equipment (CPEs), which can be readily self-installed by the subscriber. The Market Insights Report[8] estimates that 5G FWA will reduce the initial cost of establishing 'last-mile' connectivity by as much as 40% compared to a physical fibre line approach.

to funding and investment are required that ultimately enable inclusive and local value-enhancing digital transformation and strike a better balance between different digital ecosystem stakeholders benefiting from advanced network infrastructure.

Different options are being put forward by various stakeholders, ranging from spot approaches of infrastructure roll-out, including community, privately run municipality and operators subsidy broadband models; technology-based solutions such as building multi-operator shared core- and access networks; the creation of Special Purpose Vehicles or introduction of digital taxes, which a number of countries are unilaterally considering or implementing in the absence of an internationally agreed solution (see InfoBox 3); the establishment of dedicated ICT Funds into which companies that provide digital services in a jurisdiction are obliged to contribute; review and repurposing of USFs; to a "Pay and Play" model where recognition would be given for investments in network infrastructure to recognize and incentivize partnerships and innovative approaches developed by digital economy players, and many more. Which type of approach is suitable will significantly differ, depending on local economic and socio-economic contexts and circumstances, the degree of regional integration, as well as country size/scale and system in place. One immediate measure, however, which has been put forward by numerous stakeholders and to which the approach

in different countries might take a similar shape could be reviewing or re-purposing USFs – across Africa, 37 USFs are not disbursed, amounting to an estimated US$480 million. This could be a good start to freeing already earmarked funds towards the building and development of broadband infrastructure.

The debate about the need for new approaches to funding and financing of broadband development is an ongoing one, most recently the central topic of the UN Broadband Commission's Working Group "Broadband for All: A Digital Moonshot Infrastructure for Africa" that examined in detail the investments required for doubling connectivity by 2021 and reaching universal access by 2030. The Working Group found that to double broadband connectivity by 2021, nearly 220 million new people must come online and an estimated $9 billion in investment is required. Moreover, nearly 1.1 billion new unique users must be connected to achieve universal, affordable, and good quality broadband internet access by 2030, and an estimated additional $100 billion would be needed to reach this goal over the next decade.

The Report puts forward a number of proposals with regards to different financing mechanisms, stressing the importance for each ecosystem partner to play a role in mobilizing necessary resources and making contributions to infrastructure funding, financing and investment. It identifies a cost sharing percentage of two-thirds to be funded

Figure 5: Overview of different options for Broadband Funding

8 See: https://www.marketinsightsreports.com/reports/091915307/5g-for-fwa-fixed-wireless-access-2017-2030-opportunities-challenges-strategies-forecasts

Info Box 3: Digital Services Tax

France: On 11 July 2019, the French Senate adopted a law creating a "Tax on certain services provided by large companies in the digital sector", also termed the "GAFA tax" or "Digital Services Tax ("DST"), which was signed by President Macron on 24 July 2019. The DST at a rate of 3% is imposed on the gross revenues that companies derive from digital activities of which French "users" are deemed to play a major role in value creation. It applies retroactively from 1 January 2019 and should be temporary, while waiting for a long-term and coordinated solution by OECD members. According to the French government, there has been a mismatch between the location (and manner) of taxing profits resulting from certain digital activities and when and how the corresponding value is effectively generated. The DST is levied on two types of digital services, to which a specific set of rules applies. These services include (1) the provision of a digital interface enabling users to enter into contacts and to interact with others ("intermediary services") and (2) the provision of services to advertisers that aim at placing targeted advertising messages on a digital interface based on data collected about users and generated upon the consultation of such interface.

The DST sets out in detail which and how entities are affected by the tax and their obligations under the tax. Firstly, as regards applicability, the DST sets out two key thresholds, both of which must be met by French and foreign businesses for the tax to apply: €750 million annual worldwide turnover for digital services, and €25 million domestic turnover on digital services localized in France. Secondly, services must be supplied in France, determined by the user's IP address. As concerns the taxable basis, it applies on the percentage representing the portion of taxable services related to France after application of the "French digital presence" ratios to the corresponding worldwide receipts. As regards the process of payment, for any given calendar year, the digital service tax is due in April of the following year. For 2019, there are transitional rules that detail only one instalment due in November 2019, based on 100% of sums received from in-scope activities in 2018.

Overall, the DST will affect an estimated 30 multinationals, of which 17 alone are located in the US. Companies established outside the EU (or certain EEA Member States) must appoint a tax representative. In terms of the compliance burden on impacted business, the administrative reporting and compliance framework of the DST tax is aligned with the existing VAT framework. Furthermore, there is an obligation for DST taxpayers to keep all relevant data collected and details of computation for a period of 6 years to enable the taxpayer to satisfy its obligation to provide these records to the tax authorities upon request. Administrative guidelines were released in November 2019, outlining the details of this new tax. In terms of backlash, French tax professionals have expressed concerns about the digital services tax in respect of its conformity to the French constitution, to EU law, and with regard to provisions under applicable income tax treaties. Some believe that there will be taxpayers that decide to challenge the tax after they pay the first instalment. Recently, US President Trump had indicated that there would be retaliatory action on a number of luxury imports if the French DST were implemented. On the sidelines of the WEF's Annual Meeting 2020, France and the US agreed to put the Digital Tax on hold until the end of 2020.

International activities: To address the high-level tax challenges relating to the international tax framework, the OECD has been working to drive the development of an international solution to digital economy taxation issues, with the focus on "nexus" (namely, addressing the disconnect between tax jurisdiction and the location of value creation by expanding the definition of PE to encompass "digital presence" as determined by the location of a service's users), and reallocating profits (namely, reallocating taxing rights among the "countries of residence", the tax havens, and the "countries of consumption" by modifying the formulas for allocating taxable income with the users' contribution in mind (boosting the share taxable by the countries of consumption)).

The EU's efforts to reach an EU-wide consensus on a Digital Services Tax are on hold. In the meantime, a number of countries do not want to wait, pending globally or regionally agreed solutions, and are considering or moving forward with short-term gap-stop measures, including the UK, Australia, Italy, Slowakia, India, Poland, Hungary, the Czech Republic, Austria, Spain, Belgium, Slovenia and many others. While the UK government remains committed to reform of the international corporate tax framework for digital businesses, pending global reform, it is undertaking interim action, to ensure that digital businesses pay tax that reflects the value they derive from UK users. The UK government has therefore announced that it will introduce a Digital Services Tax (DST) from April 2020 of 2% on the revenues of search engines, social media platforms and online marketplaces which derive value from UK users, and which is estimated to raise £1.5 billion over four years. Other examples of unilateral action include Italy, which established a 3% web tax on digital transactions, effective January 1, 2020 ; Slovakia, which revised the tax legislation to oblige foreign digital platforms that provide transport and accommodation services such as AirBnB, Uber and Booking.com to register and create permanent establishments and pay 21 percent corporate tax ; Hungary, which proposed an internet tax in October 2017 and has implemented a 7.5% tax on digital advertising revenue of media content providers with a global tax revenue of €305,326; and India, which introduced an equalization levy of 6% on online advertising revenue in 2016 and a revised permanent establishment concept ("Significant Economic Presence" or SEP) in 2018.
(For further information see: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/FlagPost/2019/August/Digital_Services_Taxation)

by the private sector and one-third by the public sector.

While governments and public investment agencies are called upon to take an increasing role as investors in public ICT infrastructure, by e.g. reviewing the sources of USAF funds and develop innovative models to ensure the contribution base is broadened to encompass all those who derive economic benefit from the investment, sector regulators are pushed to play a key role both in establishing a level playing field in the market, but also in the implementation of key policies and regulation aiming at achieving universal, affordable, and good quality broadband. Lending institutions and development banks are called upon to increase their commitment and earmark increased budgets for infrastructure development and the private sector is urged to continue their commitment to expand networks also beyond urban population centres, including the requirement of contributions from non-network operators on a direct or indirect basis.[9] To further study in a global context what options there are for consideration to foster innovative funding, financing and investment strategies that can enable and empower existing and new business models to achieve the Broadband Commission's targets for broadband connectivity and adoption, the Broadband Commission's Working Group "21 Century Financing Models for Sustainable Broadband Development" is in the process of kicking off its work. The topic was also central to the Broadband Commission's joint meeting

Figure 6: Investment Needed to Achieve Universal Access to Broadband Connectivity by 2030 across Africa
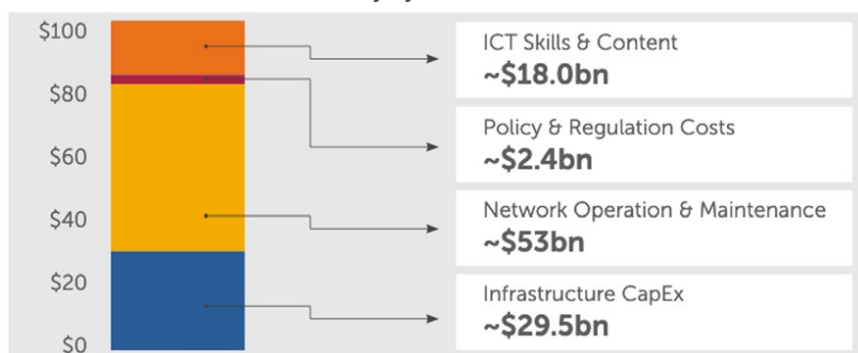
Source: Working Group Report "Connecting Africa through Broadband – a strategy for doubling connectivity by 2021 and reaching universal access by 2030", 2019, https://www.broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf

with the World Economic Forum on the sidelines of the WEF's Annual Meeting in Davos on 21 January 2020. The meeting called for increased efforts to lower the cost of broadband, as well as innovative policies to finance the rollout of broadband infrastructure to unconnected populations. Collaboration among and contribution by diverse stakeholders were highlighted as key to making universal and meaningful connectivity a reality for all.[10]

In conclusion it can be summarized that there is recognition that current ways of regulating, funding, financing and investing into broadband, which has evolved from a luxury good to a basic human right with utility character and which is the conduit of a data-driven economy, are failing to bring the last 47% of the offline population online. To ensure that digital transformation is inclusive and generates equitable outcomes, all stakeholders need to contribute in a more institutionalized way. More efforts need to be undertaken jointly by all digital stakeholders to identify and develop new approaches that drive local value-creation. Depending on the national and local context, any one solution may significantly differ in regard to its nature and impact and there will not be a one-fit-all solution.
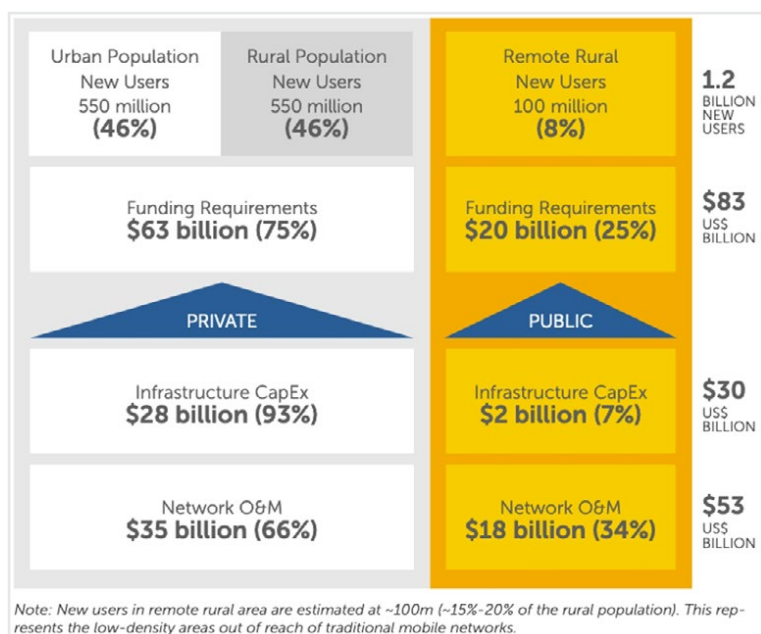
Figure 7: MFD Indicative Distribution of Cost Sharing

Source: Working Group Report "Connecting Africa through Broadband – a strategy for doubling connectivity by 2021 and reaching universal access by 2030", 2019, https://www.broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf

[9] https://www.broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf, pp. 109-111

[10] https://www.itu.int/en/mediacentre/Pages/PR01-2020-Broadband-Commission-Meaningful-Universal-Connectivity.aspx

SATELLITE NEWS

UAE Space Agency Launches NewSpace Innovation Program

The UAE Space Agency has announced its collaboration with the Abu Dhabi-based global innovation hub, Krypto Labs, to launch the UAE NewSpace Innovation Program. The program aims to maximize the growth of space technology start-ups in NewSpace, the rising private spaceflight industry. The program comes as part of the UAE Space Agency's efforts to accelerate the growth of technology start-ups in the field of space sciences. The program falls under the National Space Investment Promotion Plan which aims to heighten the role of the space industry in contributing to the economy of the UAE, while encouraging a culture of interest in the space sector, in efforts to establish a knowledge-based competitive national economy built on innovation and the latest technologies. The NewSpace Innovation Program is one of the main and most important initiatives launched by the National Space Investment Promotion Plan, initiated by the UAE Space Agency in the first quarter of 2019. The program also falls under a MoU signed between the UAE Space Agency and Krypto Labs, which aims to increase innovation and investment in the space sector, drive a diversified UAE economy, and promote awareness through specialized initiatives that support space technology entrepreneurship. Selected applicants will take part in a 3-month incubation program at Krypto Labs' headquarters in Abu Dhabi with access to the hub's facilities. They will also have access to the innovation hub's local and global network of investors, receive mentorship from global space experts, and develop their skills in business creation, marketing, and sales, among others. Applicants will have a chance to secure funds to ensure their start-up investment is ready to enter the market. Eligible applicants must present an innovative and original idea with a clear technical approach, which generates a feasible and scalable product. Applying teams must have at least one Emirati team member. Dr. Eng Mohammed

Nasser Al Ahbabi, Director General of the UAE Space Agency, said: "We are pleased to be collaborating with Krypto Labs to inspire young entrepreneurs to present their ground-breaking start-up ideas and contribute to the growth of the space industry in the UAE, along with promoting a diverse economy in the country. The UAE NewSpace Innovation Program invites students, entrepreneurs, and start-ups to share their ground-breaking ideas and transform them into viable commercial products. This supports developing space technology as part of the UAE's private spaceflight NewSpace sector, which aims to make space more accessible, affordable and commercial." "This initiative comes in line with the UAE Space Strategy 2030 and National Space Investment Promotion Plan, which seeks to encourage investment in the UAE's emerging space sector. We always encourage the development and implementation of space science and technology in the UAE, as part of the UAE Space Agency's objectives," Dr. Eng Al Ahbabi added. Dr. Saleh Al Hashemi, Managing Director of Krypto Labs, said: "We are committed to promoting and building the capabilities of local youth in space tech under the National Space Strategy 2030, and it is the UAE Space Agency's persistent support that pushes us forward in achieving this mission. By supporting innovators and young entrepreneurs, we aim to foster a spirit of originality and zest within startups to solve global challenges that keep the UAE on the frontier of the innovation map and elevate its position as a leader for innovation-focused businesses." Commenting on the program, Eng. Naser Al Rashedi, Director of the Space Policy and Legislation Department in the UAE Space Agency and Project Manager said: "This program is the first of its kind locally and regionally, as it has been planned for under the highest standards and best international practices. The program aims to successfully establish collaboration and partnership between

stakeholders from academia, research and development, space investment, and more who would benefit from space technology, incubators, and accelerators in the country." He added: "The program aims to incubate and accelerate the growth of four start-ups who will play a major role in fostering a culture of interest for the space sciences in the UAE. This comes in line with the Ghadan 21 development accelerator program, which aims to transform the emirate of Abu Dhabi into a global innovation hub. The NewSpace Innovation Program also aligns with the UAE Strategy for the Fourth Industrial Revolution which aims to strengthen the country's global position as a hub for the technological advances of the fourth industrial revolution. By February 2020, we aim to select high-skilled teams whose exceptional ideas will carry the potential to push forward our vision towards a diversified economy." "The UAE NewSpace Innovation Program seeks innovative ideas in three categories: Innovations in Space Sciences, which includes energy storage, software and applications, robotics and autonomous systems, modeling, IT and processing, science instruments, and observatories and sensor systems; Extending Human Presence in Deep Space, which includes habitation systems, life support, human exploration destination systems, space entry and landing, and life and physical sciences; and Exploration and Communications in Space, which includes thermal management systems and ground station systems, and ground and launch systems processing," explained Al Rashedi. He added: "The program is accepting applications from university students, professors, innovators, engineers, start-ups, and entrepreneurs until February 2020. As part of the program, there will be a nation-wide university roadshow. This will be followed by a competition held to select the top candidates, who will then pitch their ideas to a renowned and global panel of judges."

Space Development Agency to Start Building Its First Constellation of Surveillance Satellites

The Pentagon's Space Development Agency is soliciting pitches for technologies that will be used to build a network of satellites in low Earth orbit that would help the military find targets on the ground and track enemy missiles in flight. By late 2022, the agency wants to have several dozen satellites in orbit "to show that we can operate a proliferated constellation and that the constellation can talk to weapon systems," SDA Director Derek Tournear said Jan. 21 at a Pentagon news conference. The agency issued a broad area announcement (BAA) on Jan. 21 titled "National Defense Space Architecture Systems, Technologies and Emerging Capabilities." A BAA is an open call for ideas. Tournear was named director of the SDA in October. The agency was established in March and sits under the office of Undersecretary of Defense for Research and Engineering Mike Griffin. Congress in the 2020 National Defense Authorization Act directed that the SDA be moved to the U.S. Space Force no later than 2022. Congress in fiscal year 2020 appropriated $30.5 million for SDA operations and maintenance, $20 million for research and development, and $75 million for technology prototyping. With

funding in hand, the SDA wants to start building its first constellation — called a transport layer — that will serve two primary goals: locate targets on the ground and at sea, and track advanced missiles such as hypersonic glide vehicles. The constellation will have a mix of sensing and communications satellites so data collected by the sensors can be passed to the communications satellites, sent down to commanders on the ground or used to directly tip and cue a missile interceptor. The plan is to expand the constellation over time. By 2024 it would have hundreds of satellites to provide regional coverage. By 2026, there would be enough satellites for global coverage. The SDA intends to ultimately deploy multiple constellations that collectively could amount to thousands of satellites. In addition to the transport layer there will be a battle management layer, a tracking layer, a custody layer, a navigation layer, a deterrence layer and a support layer. Tournear said the SDA will deploy satellites faster than traditional military programs. The agency last year issued a request for industry ideas that generated 150 responses, said Tournear. Based on the information received, the SDA decided that its constellations will

operate in LEO but at higher altitudes, from 800 kilometers to 1,200 kilometers above Earth. The agency believes that there is a mature enough industrial base to support building the initial transport layer over the next two years and then start delivering one satellite a week to support the other layers. Satellites will be small to medium, in the several-hundred-kilogram category. They would have an operational life of about five years and cost around $10 million each. A solicitation specifically for the transport layer will come out this spring and contracts could be awarded as early as this summer, said Tournear. The tracking and communications satellites in the transport layer will have optical links so they can talk to each other. In a recent request for information SDA asked for pitches on optical inter-satellite link standards to inform the upcoming solicitation. The communications satellites will have tactical data links such as Link 16. The tracking satellites will have infrared sensors and will share data with the transport satellites. Tournear noted that SDA does not plan to develop a traditional communications satellite network but one designed specifically to share tactical data over a secure communications protocol.

Gilat Satellite Approaching NIS 2 Billion Acquisition by Unnamed Multinational

Nasdaq and Tel Aviv-listed satellite telecommunications company Gilat Satellite Networks Ltd. is in advanced talks to be acquired for NIS 2 billion (approximately $579 million), according to two people familiar with the matter who spoke to Calcalist on condition of anonymity. A large multinational is in advanced negotiations with Gilat, these people said. The deal's value reflects a 25% premium on Gilat's market capitalization on market open. Gilat's largest shareholder is Israel-based private equity firm FIMI Opportunity Funds, which holds a 34% stake, followed by Mivtach-Shamir Holdings with a 9.7% stake. FIMI first entered as an investor in 2012 when it bought 11% of Gilat for NIS 63 million (approximately $17 million), which at that time reflected a 7% premium. In February 2014, FIMI bought an additional 15% stake from York Capital for $10.5 million, and in October of that year it acquired an additional 10% in a tender offer for $25 million. In 2016, FIMI bought an additional 11% as part of an option allocation, reaching a 45% share FIMI has since sold 10% of its shares.

Egypt Is Set to Launch a Program for the Manufacturing of Small Satellites in Universities

Egypt is Set to launch a program for the manufacturing of small satellites in universities across the country in a collaborative effort led the Egyptian Space Agency (EgSA), the Academy for Scientific Research and Technology (ASR) and the Supreme Council of Universities. The program is one of the pillars contained in the National Strategy for Science, Technology and Innovation 2030 which was released in December by Egypt's Higher Education and Scientific Research aimed at improving the country's competitiveness in science research and development of indigenous technologies. The strategy document, obtained by Space in Africa, outlined the Ministry's intention to "establish a

laboratory for educational satellites, electronic tests and space photographs processing." Egypt's Higher Education and Scientific Research Minister Khaled Abdel-Ghafar yesterday confirmed plans for the launch of the program while chairing the maiden meeting of the Egyptian Space Agency board alongside Mohamed El-Qosi, EgSA Chief Executive Officer. Abdel-Ghafar further disclosed that the ministry will welcome a delegation from the French Space Agency to discuss space cooperation between both countries. Both parties will be looking to sign a memorandum of understanding on space cooperation. The program for the manufacturing of small satellites in universities across Egypt is a reflection of the country's recent drive to revitalize its space sector and its ambition to become a space power in the Middle East and Africa. Last year, Egypt launched four satellites into space, of which two were developed locally by Egyptian engineers at the National Authority for Remote Sensing and Space Sciences (now the Egyptian Space Agency). With a record nine satellites launched into space from 1998 to 2019 by Egypt's Nilesat and the Egyptian government, Egypt currently tops the chart for the highest number of satellites launched by an African nation. The North African country is also investing in other space infrastructure including a satellite assembly, integration and testing (AIT) center, ground station facilities and the China-funded MisrSat II Earth observation satellite in collaboration with the Chinese government. Located in the iconic Egyptian Space City near the New Administrative Capital in Cairo, the space facilities, when completed, will boost Egypt's competitiveness in space science research and technology development.

Hispasat Buys GEO Satellite from Thales Alenia Space

Hispasat purchased a satellite from Thales Alenia Space Jan. 10, marking the operator's first satellite order since being acquired by Spanish power company Red Eléctrica last year. Thales Alenia Space will build a new satellite called Amazonas Nexus, designed with Ku-band coverage over both American continents, plus Greenland and North Atlantic transportation routes. Hispasat and Thales Alenia Space signed the manufacturing contract in Madrid. Amazonas Nexus will replace Hispasat's Amazonas-2, an 11-year-old satellite located at 61-degrees west that provides C- and Ku-band coverage of Pan-America. Satellite operators have increasingly pushed manufacturers to not build satellites with frozen coverage patterns, but with

flexibility to change the location, power and even shape of their communications beams. Hispasat is no exception. Thales Alenia Space said Amazonas Nexus will feature a new digital transparent processor that will allow Hispasat to reassign the satellite's capacity as markets change. Hispasat Chief Executive Miguel Ángel Panduro said Amazonas Nexus will be "the most dynamic and advanced satellite in our fleet" after it launches in the second half of 2022. A launch provider has not been announced. Amazonas Nexus will have Ka-band feeder links for telemetry and control, a feature Hispasat said will optimize communications with gateway ground stations and free up more onboard capacity for commercial applications. Amazonas Nexus has a projected mass of

4,500 kilograms, 20 kilowatts of onboard power, all-electric propulsion, and a design life of 15 years. Commercial customers have signed long-term leases for close to 30% of the satellite's capacity prior to launch, Hispasat said, providing anchor customers to validate the operator's business plan for the satellite. Though based in Spain, more than 65% of Hispasat's revenue comes from the Americas, mainly Latin America. Hispasat, citing research firm Euroconsult, said demand for geostationary data capacity is expected to grow fivefold in "the American continent" over the next 10 years. Amazonas Nexus is designed to capitalize on that projected growth, particularly for broadband to aircraft, ships and government end users.

New Iran Made Satellite Ready for Launch

President of Iran's University of Science and Technology Jabbar Ali Zakeri said that the IUST has delivered the home-made Zafar satellite to the country's Space Agency (ISA) to be launched into the orbit soon. "Zafar satellite has been delivered to the ISA and the launch procedures are underway at the organization," Zakeri told FNA. He added that the satellite will be the first spacecraft which will be launched by Iran into the orbit in the next three months. Zakeri had told FNA in May that Zafar is designed by experts at research center of the university and it weighs 90 kilograms, is equipped with color cameras and can survey the oil reserves, mines, jungles, and natural disasters. Iran launched its first satellite, called Omid (Hope), in February 2009. The Rasad (Observation) satellite was also sent into orbit in June 2011. In February 2012, Iran successfully put its third domestically manufactured satellite, named the Navid (Promise), into orbit. On February 8, 2012, Iran received the first image sent by the Navid satellite. Earlier, Head of the Iranian Space Agency (ISA) Morteza Barari said that experts and scientists at the Tehran-based Amirkabir University of Technology will start the development project of a telecommunication satellite dubbed 'Payam 2' by late May. Barari said that three development plans for building Payam 2 are being reviewed and the production operation will commence within three weeks, once the best plan is selected. Building the device will take up to four years, he added. The move comes after an earlier version of the satellite, dubbed Payam, was successfully launched into space in January, but the technical problems that occurred during the final stage of the launch prevented the spacecraft from reaching orbit. Following the incident, Minister of Communications and Information Technology Mohammad Javad Azari Jahromi said that Iran failed to orbit Payam satellite successfully. The rocket carrying the Payam satellite failed to reach the "necessary speed" in the third stage of its launch, Azari Jahromi said at the time. According to him, the rocket had successfully passed its first and second stages before developing problems in the third. He did not elaborate on what caused the rocket failure. President of Amir Kabir University of Technology Seyed Ahmad Motamedi underlined in February Iran's capability to orbit high-quality satellites in an altitude 500km above the Earth. "We are able to send satellites to the 500-km altitude and we can design satellites based on international standards," Motamedi said. Iran is one of the 9 superior states in building satellites beside the US, Russia, Europe and Canada. Barari had announced in December 2018 that Iran was planning to manufacture a home-made telecommunication satellite in the next few years. "Building an indigenized telecommunication satellite within the next 7 years is atop the ISA's plans," Barari said. He added that the preliminary steps had already been taken by Iran to manufacture a telecommunication satellite by building Nahid 1 and Nahid 2 satellites. Barari underlined that Iran also planned to build a sensing satellite with a 1-meter precision power in 7 years. Barari had also announced in October 2018 that his country was standing among the 9 top world countries in developing satellites. He also added that Iran ranked first in the region in the aerospace sector, explaining that Iran ranked 14th in the world in 2016 but it jumped three grades and ranked 11th in the world in 2017.
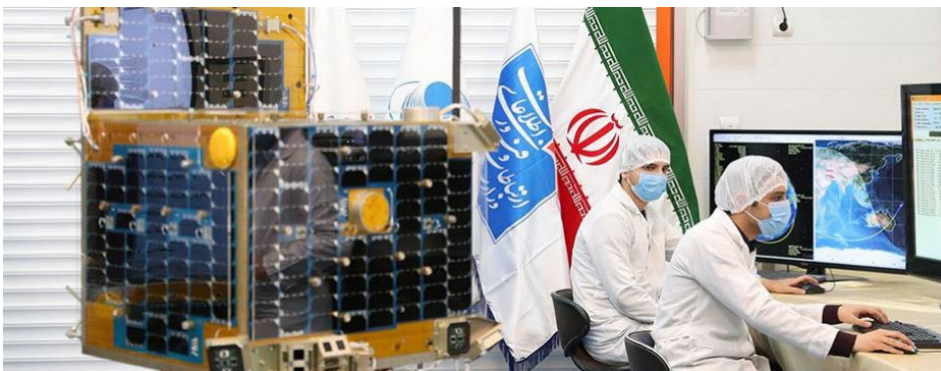
Blue Canyon Technologies to Build Spacecraft Bus for MethaneSAT

MethaneSAT has selected Blue Canyon Technologies (BCT) to develop and build the spacecraft bus for its first mission, which is scheduled to launch in 2022. The donor-funded mission aims to provide global, high-resolution detection and quantification of methane emissions from oil and gas facilities, as well as measure emissions from other human-generated methane sources. The satellite will be designed using BCT's newest X-SAT line of spacecraft, specifically the X-SAT Saturn-Class, which it says can carry payloads up to 200 kg. The X-SAT Saturn-Class's compact profile is intended to maximize the volume, mass and power available for the methane measuring instrument. BCT says it is currently building more than 60 spacecraft for government, commercial and academic missions. "Reducing methane emissions is critical to slowing the pace of climate change, and we're proud that our small-satellite technology will help MethaneSAT and the Environmental Defense Fund with this important mission," George Stafford, President and CEO of Blue Canyon Technologies said. "Our technology will make it less expensive and quicker to launch, allowing them to collect more data sooner."

First Spacebus Neo Satellite Set for Launch

The first satellite developed under an initiative to help European industry deliver competitive satellites for the commercial telecommunications market has entered its final phase before launch. Konnect will provide broadband services for Europe and Africa, and was built by Thales Alenia Space for Eutelsat, its commercial operator, under an ESA Partnership Project. After a long flight on board an Antonov cargo plane from Nice airport in France, the satellite was delivered to the launch site in French Guiana inside its large transport container. The satellite has completed its short and efficient launch campaign. Teams at the launch site have conducted all tests and inspections, and confirmed that sub-systems are flight ready. The satellite was placed on the upper position of the secondary payload adapter and then within the fairing. These assembled parts have now been fitted on top of the launcher, during the last major step of the mechanical integration of the Ariane 5 rocket. The satellite is now ready to be launched on 16 January, for the first Ariane launch of 2020, flight VA251. After the launch of Konnect, the Spacebus Neo program will continue to introduce further innovative technologies to the next satellites to be launched. So far Thales Alenia Space has sold seven Spacebus Neo satellites. The next six missions will be: the French government's Syracuse-4; SES-17; another two Eutelsat missions called Konnect Very High Throughput Satellite and Eutelsat 10B, which will provide connectivity services for aviation and maritime transport; Satria, which will be operated by the Indonesian operator Pasifik Satelit Nusantara; and Amazonas Nexus for Hispasat, a Spanish operator, which will deliver high-capacity mobility services for aviation and maritime transport.

The Spacebus Neo product line is developed in the frame of ESA's program of Advanced Research in Telecommunications Systems (ARTES) and the French PIA ("Programme d'Investissement d'Avenir"), in cooperation with ESA Member States, and managed jointly by ESA and the French Space Agency, CNES. It has generated an exceptional return on investment to European industry and ESA Member States. The Neosat program comprises both Spacebus Neo by Thales Alenia Space and Eurostar Neo by Airbus. It includes development and in-orbit validation of the new satellite product lines for both companies, allowing the two European satellite prime integrators to deliver competitive satellites for the commercial market.

Broadband Satellite Put Into Orbit

A broadband communication satellite, developed by a Beijing-based company, was launched from the Jiuquan Satellite Launch Center in northwest China. The satellite, the first of many from Beijing-based GalaxySpace, was sent into its planned orbit by a Kuaizhou-1A carrier rocket. Deployed in low-Earth orbit, the satellite has a communication capacity of up to 10Gbps. Relative technological tests will be conducted on the satellite. GalaxySpace aims to build a LEO broadband satellite constellation and create a global 5G communication network. KZ-1A is a low-cost solid-fuel carrier rocket with high reliability and a short preparation period. The rocket, developed by a company under the China Aerospace Science and Industry Corp, is mainly used to launch LEO small satellites.

SADC Countries to Implement Satellite Sharing System

The implementation of a satellite sharing system would boost the sustainable development of the African continent, Angola's Secretary of State for Telecommunications Mario Oliveira said at a seminar of the Southern African Development Community (SADC). The system would enable African people to have quicker access to information, Oliveira said, adding that it would mark an important step for SADC members to enter the space industry. Oliveira also said Angola plans to resend a national satellite into orbit in the future, despite the failed launch of its first geostationary satellite the Angosat-1 in 2017. George Ah-Thew, SADC senior coordinator for science, technology and information, said SADC countries are drafting the policies for the satellite sharing system. SADC is a regional economic group established in 1992 made up of 16 member states, whose goal is to reduce poverty in and develop the economy of the southern Africa region.

China Successfully Launches Its Heaviest Communications Satellite

China has launched its heaviest and most advanced communications satellite on the country's largest new carrier rocket Long March-5 that will lay the foundation for the development of highly sensitive space probes. Aboard the third Long March-5 rocket, Shijian-20, a new technology test and verification satellite, successfully entered its orbit Friday night, state-run Xinhua news agency reported. Launched from the Wenchang Space Launch Centre in south China's Hainan Province, Shijian-20, weighing more than eight tones, is the country's heaviest and most advanced communications satellite in geosynchronous orbit, according to its maker, the China Academy of Space Technology (CAST) under the China Aerospace Science and Technology Corporation (CASC). The Long March-5, China's most powerful rocket and a critical ingredient in the nation's ambitious space program, can carry a maximum payload of 25 tones into low Earth orbit and 14 tones into geosynchronous orbit. The successful launch is a major step forward for its planned mission to Mars in 2020. The satellite will carry out orbit experiments for a series of key technologies, the CAST said in a press release. It will demonstrate in orbit its heat transfer technology

based on cryogenic loop heat pipes, an efficient thermal control device for space applications, to lay the foundation for the development of highly sensitive space probes. The satellite will test the controllable deformation of shape memory polymers, a type of smart material that can switch between temporary shapes, to pave the way for the development of large variable space structures. It will also carry out satellite-ground communication tests using Q/V bands, which lie between 33-75 GHz, within the extremely high frequency (EHF) area of the radio spectrum. These

frequencies are used mainly for satellite communications. "The major way to improve the satellite communication capacity is to expand the bandwidth of the available frequency bands. If we liken the geostationary orbit to an expressway, which is now the most crowded in space, the use of Q/V bands will help to widen the expressway by four to five times," said Li Feng, chief designer of the satellite with the CAST. The test is key to the development of the next generation of high throughput satellites capable of delivering 1Tbps bandwidth for ultrafast speeds, he said.

Inmarsat's GX5 Satellite to Offer Broadband Coverage over Middle East, Europe

Rebecca Cowen-Hirsch, Senior Vice President of Government Strategy and Policy at Inmarsat, said the company added a satellite to the Global Xpress constellation to address a demand for commercial broadband services in the Middle East and Europe. Cowen-Hirsch noted that military organizations seek commercial Ka-band satellite connectivity that works to complement the Wideband Global SATCOM system. The Global Xpress 5 satellite was launched on Nov.

26 and is slated to join the fleet early next year. "GX5, adding to that mix, looks at an area where we've got increased and significant demand," Cowen-Hirsch was quoted as saying. "It is a very, very dense environment for commercial as well as military. So we've got a satellite that was specifically put to cover that particular region." About Executive Mosaic: Founded in 2002, Executive Mosaic is a leadership organization and media company. It provides its members an opportunity

to learn from peer business executives and government thought leaders while providing an interactive forum to develop key business and partnering relationships. Executive Mosaic offers highly coveted executive events, breaking business news on the Government Contracting industry, and delivers robust and reliable content through seven influential websites and four consequential E-newswires. Executive Mosaic is headquartered in Tysons Corner, VA.

Capella Unveils Radar Satellite Design

Capella Space unveiled the new design Jan. 21 for its Whitney constellation of seven synthetic aperture radar satellites scheduled to launch in 2020. Weighing in at 100 kilograms, the new satellites are about twice the size of Denali, Capella's 48-kilogram technology demonstration spacecraft launched in December 2018. "We spent a lot of time talking to key customers and end users and the message we received was very clear," Christian Lenz, Capella vice president of engineering, told SpaceNews. "A high-performance, low-latency, excellent user experience system was needed." To achieve that vision, Capella made significant changes to the Denali design. The firm doubled the size of solar arrays,

added a second star tracker, opted for larger reaction wheels and redesigned the reflector antenna for its Whitney constellation. Capella's new 3.5-meter aperture deployed mesh-based reflector antenna is designed to deliver high-contrast, low-noise imagery with resolution better than 50 centimeters. "Implementing all of these improvements, however, did require making difficult choices," Payam Banazadeh, Capella founder and CEO, said in a Jan. 21 blog. "We delayed commencement of service by eight months to complete and validate Sequoia's evolved design." In addition to redesigning satellites, Capella worked on streamlining processes for accepting orders, tasking satellites and delivering imagery. Capella customers will request imagery electronically. The firm will then uplink requests to its constellation through Inmarsat communications satellites. On the back end, Capella will rely on Amazon Web Services and Amazon Ground Stations to reduce the time it takes to get imagery and data from the satellite to the ground, process it and get it to the user, Lenz said. Sequoia, Capella's first operational satellite, is scheduled to launch in late March on a SpaceX Falcon 9 rocket alongside Argentina's Saocom-1B synthetic aperture radar satellite. Capella plans to launch three additional radar satellites in mid-2020 and three more by the end of the year, Lenz said. Capella customers include the U.S. Air Force, which awarded the firm a contract in November after Space Pitch Day, and the National Reconnaissance Office, which awarded the firm a study contract in December.

Arianespace Launches Eutelsat, ISRO Satellites on First 2020 Mission

European launch provider Arianespace completed its first launch of the year Jan. 16, sending two communications satellites into geostationary transfer orbits. The Ariane 5 rocket lifted off from the Guiana Space Center at 4:05 p.m. Eastern with the 3,600-kilogram Eutelsat Konnect satellite and the 3,400-kilogram GSAT-30 satellite. Eutelsat Konnect separated from the rocket's upper stage about 28 minutes later, followed by the Indian space agency ISRO's GSAT-30 satellite after another 10 minutes. Eutelsat Konnect is both a technology milestone for Europe and a tactical gambit for Eutelsat after the company abandoned plans to invest in a Viasat satellite two years ago. The European and French space agencies helped fund the satellite because it uses a new Neosat satellite platform intended to lower the cost of manufacturing. The goal of the Neosat program is to give European manufacturers an edge over competitors in the U.S. and Asia. Thales

Alenia Space built the all-electric satellite on its Neosat bus, which it brands Spacebus Neo. Eutelsat Konnect took four years to produce, Yohann Leroy, Eutelsat's deputy CEO, said in a post-launch speech. "Beyond Eutelsat, this is the success of a European dream team," Leroy said. Eutelsat then split Konnect's capacity to cover Western Europe and get a head start over Viasat, whose Europe, Middle East and Africa-focused ViaSat-3 satellite isn't expected to launch until mid-to-late 2021. Peter Newell, Eutelsat's program manager for Konnect, said the Ka-band satellite will initially cover 15 countries in Europe and 45 countries in Africa. The satellite's coverage can later be reallocated fully to Africa, he said. Eutelsat has a larger very high-throughput satellite called Konnect VHTS planned for launch in 2022. The 500 gigabits per second Konnect VHTS satellite is fully dedicated to European broadband. Thales Alenia Space is building Konnect VHTS as well, also using a Spacebus Neo

platform. Leroy said Eutelsat Konnect should reach its orbital location this summer, and begin commercial service in the fall. General Dynamics and Hughes Network Systems are building the ground infrastructure for the satellite, he said. Thales Alenia Space has sold seven Spacebus Neo satellites since the program began in 2015. Airbus Defence and Space, which also has a Neosat platform it brands Eurostar Neo, has sold four. Jan Woerner, director general of the European Space Agency, hailed the success of the Neosat program. "Now we are in 2020 and 11 of these satellites are already sold," he said. "This is a tremendous success." Magali Vaissiere, the departing director of ESA's Telecommunications and Integrated Applications division, spearheaded the Neosat program, Woerner said. Woerner said 17 countries contributed to the Neosat program.

ARTICLE

The Journey to Digital Operations Management

> *When it comes to digital services, the moves are all about disrupting how our business works today and the necessity of putting in place a next-generation operating model that can sustain new levels of speed, agility, efficiency, and precision.*

In today's fast paced era, customer expectations change quickly, in turn radically shifting Business and IT Strategies. IT teams today are facing an increasingly complex landscape of technologies, methodologies with both regulatory and compliance pressures to ensure that new processes are standardized and traceable.

It is a well-known fact that we live in a connected, always-on world where seconds matter when it comes to customer delight. It is not always about just the incident management process rather it is important to consider the bigger picture beyond basic alerting and incident response.

Today, everyone is looking at shifting from Traditional Operations to Digital Operations Management. Digital Operations Management brings together machine learning, automation, and DevOps-centric workflows to mobilize teams where it matters the most. When it comes to digital services, the moves are all about disrupting how our business works today and the necessity of putting in place a next-generation operating model that can sustain new levels of speed, agility, efficiency, and precision.

Accepting this new reality means overcoming some challenges. There is a need to have a digital operations management platform that addresses operational pain—but the platform also should set up teams and larger organizations with the ability to proactively take advantage of opportunities to deliver innovation and delight customers as opposed to simply reacting to incidents.

At the end, digital operations means quicker turnaround time with a digital connected workforce having analytics driven insights with various digital platforms for smoother operations and delivery. Having a digital operations center with best in class reporting and dashboard renders a 360-degree view of every measurable facet of the user experience.

Sudesh
VP, Delivery Head – Infrastructure & Cloud Services MEA
Tech Mahindra

Tech Mahindra

Digital Operations Management is a combination of

1. **Analytics:** Predictive Analytics and Real time Dashboards help operational team to get online data, which is churned into dashboards and helps the team to look around and see what is coming and respond before the actual issue hits the environment thereby reducing business outages.

2. **DevOps:** Modern Businesses are moving at the speed of cloud and DevOps is essential for any business aspiring to be lean, agile, respond rapidly to changing needs. DevOps is a set of practices that combines development and operations to shorten the lifecycle thereby improve collaboration between all stakeholders from planning through delivery

3. **AI Ops:** AIOps is the application of artificial intelligence for IT Operations combining algorithmic and human intelligence to provide visibility into performance of IT Systems. A mathematical model processes data from multiple sources, identifies significant events without the requirement of manual intervention, and enables workflows to be triggered for remedial actions.

4. **Digital Operations Centre:** Digital Operations Center transforms IT and ops teams from performing a traditional and sequential delivery model for ops into a new age, agility-driven, nonlinear service delivery model. The solution incorporates best practices framework and best of breed technologies that focus on collaboration, rich service experiences, extreme automation, and agility, to enable outcome-driven solutions for our customers. The Digital Operations Center breaks down organizational siloes and offers agile, out-of-the-box, cost-effective, and value-driven solutions that enable our customers. The core benefits which comes from Digital Operations will focus on
   • Speedy creation, launch, and monetization of new services

> *We leverage in-house IP/tools/accelerators to implement a service automation platform for productivity improvements. TechM documents a list of all workflows and tasks of various service lines to be automated and uses its service automation platform tools to automate in a phase-wise manner based on the ease of implementation.*

   • Optimization of tools and assets
   • Automation and Runbook Automation
   • Better resource utilization and work scheduling
   • Faster resolution through ticketless service desk and AI/ML/Bots

5. **Leverage latest tools and technology:** We leverage in-house IP/tools/accelerators to implement a service automation platform for productivity improvements. TechM documents a list of all workflows and tasks of various service lines to be automated and uses its service automation platform tools to automate in a phase-wise manner based on the ease of implementation. The list of workflows and tasks are tracked as a CI Key Performance Indicator (KPI) on monthly basis to ensure a high percentage of service support and delivery activities are automated. Examples of workflows and task automation activities in services include the following:
   • System and application shutdown task
   • Patch management workflow and automated procedures to apply patches

   • System installation and image deployment workflow and procedure
   • User management
   • System recovery workflow and procedures

6. **Digitally connected workforce:** This means the workforce needs to adapt to change and increase their knowledge from basic technologies to more niche areas and move the mundane repetitive jobs to be done through automation. This in turn will reduce the human errors due to repetitive tasks and increase job satisfaction among the resources by enabling them to make higher-level contributions. The connected workforce is about resources communicating via all kinds of tools. It's also about enabling remote working and the accessibility of documents, applications and systems. At a more advanced level, however, the connected workforce is about more than just practicalities. The power of the connected workforce lies in its potential to connect various elements of a business ecosystem, including data, computing devices, applications, solutions and stakeholders.

> *As technologies and customer expectations continue to evolve, it is high time that enterprises look to digital operations as a means to deliver desired value to customers or risk being left behind.*

Finally, the aim is to deliver the right model for customers at the first opportunity in order to enhance customer experience and in turn increase profitability. As technologies and customer expectations continue to evolve, it is high time that enterprises look to digital operations as a means to deliver desired value to customers or risk being left behind.

Connecting and protecting what matters most

It's what we do – by focusing on people, partners, applications, devices, and data.

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WHOLESALE NEWS

Liquid Telecom to Start Wholesale 5G Network in South Africa

African wholesale operator Liquid Telecom is adding a 5G wireless network to its existing fiber offering in South Africa. The company says the service, which will operate on 3.5GHz, will be available "in all major South African cities" and will be aimed at all service providers. "This breakthrough 5G wholesale service will create innovation in every aspect of South African society and industry," said Liquid Telecom chairman Strive Masiyiwa. "For the first time, mobile network operators and ISPs will have open access to Liquid Telecom's new 5G mobile network. The launch of the service also underscores Liquid Telecom's vision to bring high-speed connectivity to everyone." South African IT-based web news service Techcentral reported last year that Vodacom, the African subsidiary of Vodafone, has already signed a deal to use Liquid's 3.5GHz spectrum for 5G services, beating the South African government's plan to license 5G spectrum later in 2020. Liquid has 56MHz worth of spectrum in the 3.5GHz band, says Techcentral. Group CEO Nic Rudnick called the decision to l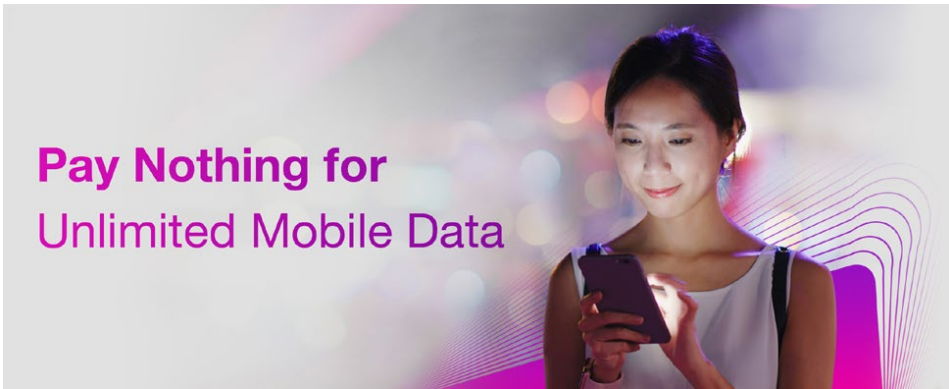aunch a wholesale wireless service "a milestone moment" for the company. "Our wholesale operating partners can exploit our new ultra-fast 5G roaming network to build the next generation of communications and make innovation possible, anytime, anywhere. 5G will facilitate real-time remote collaboration, improved business efficiency and lower costs – ultimately driving growth in the South African economy." Liquid has not given a launch date for the wireless service, but says it will be "available from early 2020".

TPG Extends Free Trial, but Suspends Data Roaming in Malaysia and Indonesia

Singapore's new fourth telco TPG (Singapore), which is owned by Australia's TPG Telecom, has announced the extension of its free mobile trial – for some 300,000 subscribers – as it strives to smooth out coverage and performance issues of its fledgling 4G network. Vulcan Post notes, however, that TPG also revealed it is temporarily suspending its free unlimited data roaming in Malaysia and Indonesia, first introduced in July 2019. 'These two countries are two of the top travel destinations for Singaporeans due to their proximity, so many of our customers (can) save and break away from existing high roaming charges,' said TPG executive chairman David Teoh. In an email to users dated 14 January, however, TPG thanked them for their 'ongoing support' of the trial before updating them that: 'Based on subscriber feedback on the trial roaming services to Malaysia and Indonesia, we have decided to suspend … roaming from 16 January 2020 temporarily. We are reviewing options to provide better quality and coverage and expect to resume roaming services to these destinations shortly.' In addition to the news of this temporary suspension, TPG said that it will be offering free trial roaming to the Philippines from 31 January 2020.

SNCF Planning to Provide Wholesale Access to Its Fiber Network from 2H20

France's state-owned railway company SNCF is mulling an entry into the wholesale fiber market in direct competition with established players Orange France and Altice France, local news source Les Echos writes. According to unnamed sources, the company is planning to start selling wholesale fiber access to small regional business-oriented telecoms providers from the second half of 2020. SNCF currently owns a fiber network spanning 20,000km.

Wholesale Carriers Terminated Approximately 327 Billion Minutes in 2018

Many retail service providers, such as mobile operators, MVNOs, and cable broadband providers, rely heavily on wholesale carriers to transport and terminate their customers' international calls. Wholesale carriers terminated approximately 327 billion minutes of traffic in 2018, down 3% from 2017. While wholesale traffic declined in 2018, over the last 10 years it has seen a compounded annual growth rate of 3%. Consequently, the ratio of international traffic terminated by wholesale carriers increased from 59% in 2008 to 72% in 2018. Traffic to mobile phones in emerging markets has historically spurred expansion of the wholesale market, and that demand continues to drive wholesale's relative growth. In 2018 wholesale carriers terminated 86% of traffic to Sub-Saharan Africa, Central Asia, and South America, but only 54% of traffic to Western Europe. Revenues on calls to sub-Saharan Africa grew 26% between 2011 and 2018, $2.4 billion to $3.0 billion. Conversely, revenues on calls to Western Europe fell substantially from $1.2 billion to $900 million. Consequently, the ratio of international traffic terminated by wholesale carriers increased from 59% in 2008 to 72% in 2018. Traffic to mobile phones in emerging markets has historically spurred expansion of the wholesale market, and that demand

continues to drive wholesale's relative growth. Declining wholesale prices stabilized in 2015 and have inched up ever since. This had resulted in a modest increase in wholesale revenues between 2016 and 2017. But 2018's drop in wholesale volumes wiped away that gain. As a result, revenues dropped last year to $13 billion, below the 2014 peak of $14.4 billion. Wholesale operators make the bulk of their revenues in only a handful of regional markets. Africa, for example, received 9% of the world's wholesale traffic, but accounted for 34% of wholesale revenues ($4.4 billion.) Countries in the Middle East accounted for 6% of world

wholesale traffic, but 12% of wholesale revenues ($1.6 billion). Wholesale revenues are bolstered by a select set of low-traffic routes with stubbornly high prices. Wholesale revenues are bolstered by a select set of low-traffic routes with stubbornly high prices. For example, the France to Tunisia route accounts for just 0.3% of international traffic, but, at $0.37 per minute, it provides 3% of all revenues. Thanks to low termination prices in Mexico, the U.S.-Mexico route serves as a converse example: that massive route represents 7% of all international traffic in the world, but only 0.4% of wholesale carrier revenues.
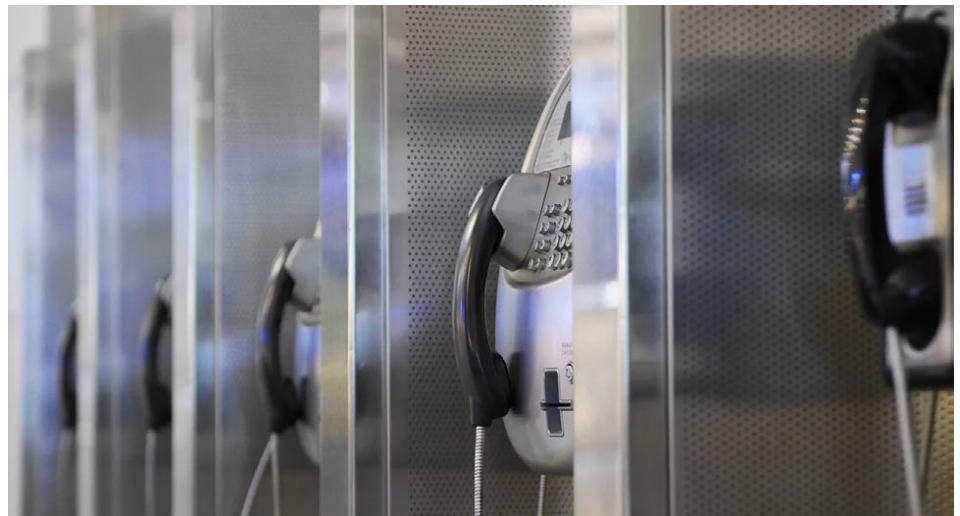
Three New Trends in Voice Pricing

Until 2015, international carrier voice traffic had increased in each of the previous 60 years. But for the past four years, paid

call volumes have slumped with no end in sight. International carriers had already suffered from revenue stagnation due to slow traffic growth and falling prices. The unprecedented occasion of outright traffic decline, however, marked a new and depressing turning point. In reviewing developments from the past year for our freshly-updated TeleGeography Report and Database, three major pricing trends stand out:

· Retail international call revenues peaked in 2012, and have been on the decline ever since. Retail revenues have

decreased from $99 billion in 2012 to $70 billion in 2018.

· Retail prices were essentially unchanged in 2018, at about $0.15 per minute. Unfortunately, we anticipate that traffic loss will overwhelm this recent price stabilization, and that revenues will decline by a forecasted 9% in 2019.

· At current run rates, international service revenues will fall to $50 billion by 2024. If that trend holds true, revenues will have declined by nearly half of the $99 billion total in the 10 years after 2012.

Connectivity for Everyone: New Funding and Financing Approaches

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Principal
Arthur D. Little

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> *Governments in Middle East have demonstrated a strong interest in development of telecom/ ICT infrastructure, considering that the sector shall be a key pillar in achievement of their ambitious national strategies.*

Ubiquitous gigabit connectivity will be the backbone of our future economies and societies. The generation and consumption of data is increasing exponentially and will continue to do so, driven by consumer trends such as increased usage of mobile devices, rising video/ streaming demand, and advent of new data-intensive applications enabled by Virtual Reality/ Augmented Reality etc. as well as industrial/ governmental applications such as Industry 4.0, smart communities/ cities etc. enabled by technologies such as Internet of Things (IoT), Artificial Intelligence and Edge computing. These technologies will form basis for new/ innovative services and applications that require networks with enough capacity, quality and reliability to eventually support throughput requirements as high as potentially 1Gbps.

For realization of these Gigabit societies/ economies, both fixed and mobile networks will need to be upgraded. 5G will be a crucial connectivity enabler to facilitate transportation of such large volumes of data and reduce response time/ latency. According to Ericsson, 5G is expected to carry 35% of global mobile data traffic by 2024. The GSM Association (GSMA) forecasts that meeting such rapidly increasing mobile traffic demand in the world's main cities by 2025 will require network operators to at least double, and in some cases triple, their capital and operating expenditures. At a cumulative level, estimates suggest 5G to require an investment to the tune of USD 1 trillion by 2025.

Historically, financing for information and communications technology (ICT) infrastructure has primarily come from private sector industry players such as telecom operators, Internet Service Providers (ISPs) and tower companies. However, under the current situation of declining telecom ARPUs and reducing margins given increased direct competition from internet players, telecom operators are becoming increasingly disincentivized to invest in new ICT infrastructure deployment. Public entities and other private players have also

traditionally engaged in financing telecom infrastructure however in a limited manner.

Given the criticality of telecom/ ICT infrastructure for development of gigabit society/ economy and the benefits that such a society/ economy would unlock for various stakeholders, that is, the government, private sector enterprises as well as individuals, there is an increase in the number of entities keen to fund this telecom/ ICT infrastructure deployment. Governmental entities in some markets are already making regulatory changes to promote investment, and are even taking an active role as direct investors in some instances. Financial players and technology companies are also joining in. Given their ability to have longer-term investment horizons and their acceptance of relatively lower return expectations for a lower risk infrastructure business, vis-à-vis fully integrated telecom operators, they are expected to become formidable players in the game going forward.

In addition to "who funds it?", there is also an increase in the types of assets, that is, "what is being funded?" and in the ways these investments are structured, that is, "how is it funded?".

One example of the type of assets ("what") is asset bundling, an asset class that has been widely used in transportation and civil infrastructure projects and is now entering the telecom/ ICT space. This product spreads the risk of small unattractive ICT infrastructure projects by bundling them with larger projects that expect strong potential financial returns. The portfolio of projects is offered under a single procurement contract and can cover

projects across geographies and technologies. Beyond risk diversification, project bundling also allows the investor deploying the infrastructure to exploit economies of scale and to achieve contracting efficiencies, there reducing overall cost. As an example, the state of Kentucky in United States awarded in 2018, a bundled contract to develop several fiber optic infrastructure projects that totaled a network of approximately 3,000 miles. Another formula, that involves support of public entities or development banks, consists of backing a project with a credit guarantee. A guarantee diminishes risk not by reducing the probability of default, but by altering the exposure to losses ensuring either complete or partial compensation. Guarantees are generally granted to projects that observe high risks but present high potential socio-economic returns for a location. In 2017, the World Bank through its Multilateral Investment Guarantee Agency (MIGA) offered ~USD 115 million guarantee to the Second HyalRoute Fiber Optic Cable Network Project of 4,500 km in Myanmar to the Industrial and Commercial Bank of China that was funding the project. To limit the risk and attract even more risk-averse investors, additional levers can be introduced around structuring of investments ("how"). Identifying different investors and aligning on their contributions towards telecom/ ICT infrastructure projects can be a challenging task. To overcome the complexity associated with this process, innovative approaches are becoming more mainstream to ensure that projects are paired with operators and adequate financing opportunities. For example, the establishment of infrastructure marketplaces is becoming more popular

in developing countries, bringing together ICT infrastructure project owners with investors, public sector players and other stakeholders to understand the project in detail, discuss potential investments and arrive at combined funding arrangements. A simpler solution beyond marketplaces entails setting up organizations funded by governments, development banks or NGOs that support telecom operators to solicit funds from other players towards expansion or upgrade of infrastructure. A case in point is the 'Mobile Solutions Technical Assistance and Research project' funded by the U.S. Agency for International Development (USAID) that offers a service where it supports telecom operators to attract project-based co-investment from other private entities beyond the telecom industry.

The financing model to prevail in the future shall depend on multiple factors, including investment amount required, risk associated with the project and competitive landscape of telecom market in the country. Governments in Middle East have demonstrated a strong interest in development of telecom/ ICT infrastructure, considering that the sector shall be a key pillar in achievement of their ambitious national strategies. For example, In Bahrain, Telecommunications Regulatory Authority (TRA) is the primary driver behind many ongoing developments that shall improve both telecom infrastructure and services. Additionally, favorable regulatory environments are being promoted in an attempt to attract and localize investments in the sector, as is the case with Communication and Information Technology Commission (CITC) in Saudi Arabia. In addition to the public sector, private players have also shown interest in investing in the region. In October 2019, the German development finance institution DEG (Deutsche Investitions- und Entwicklungsgesellschaft) together with the EIB (European Investment Bank) announced a co-investment in modernization of infrastructure for the telecom industry in Lebanon. In summary, it is clear that co-investment shall be a key funding approach for these critical projects going forward, and that the telecom operators shall have access to an active ecosystem of players willing to partner with them in this journey.
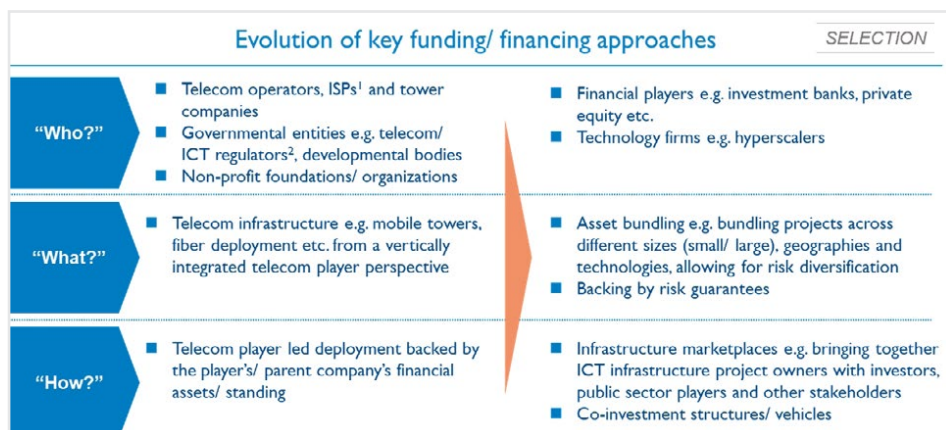

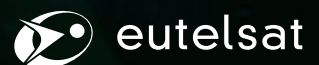
Figure 1: Evolution of key funding/ financing approaches

TECHNOLOGY NEWS

SK Telecom Achieves Standalone 5G Data Session

South Korea's SK Telecom (SKT) claims to have successfully conducted the world's first standalone (SA) 5G data session on its multi-vendor commercial fifth-generation network. In a press release announcing the development, the mobile network operator (MNO) said that as a result of what it called the 'major breakthrough in 5G', it was now fully set to provide SA services on the network. In line with this, the MNO now plans to launch a 5G SA service in the first half of this year. SKT's standalone 5G data call took place on 16 January 2020 in Busan, the second largest city in Korea, using the operator's commercial 5G network deployed in that region. To achieve the milestone, the cellco applied SA New Radio (NR) software to its existing non-standalone (NSA) 5G base stations, while completing multi-vendor interoperability between network equipment provided by Ericsson and Samsung. SKT noted that it has also applied key 5G technologies such as network slicing and mobile edge computing (MEC) in an SA environment.

Commenting on the development, Park Jong-kwan, SKT's Vice President and Head of 5GX Labs, was cited as saying: 'With the successful standalone 5G data call on our multi-vendor commercial 5G network, we are now standing on the threshold of launching standalone 5G service, a key enabler of revolutionary changes and innovations in all industries … SK Telecom will offer the best 5G networks and services to realize a whole new level of customer experience in the 5G era.'

Liquid Telecom SA Planning to Launch 5G in Early 2020

Liquid Telecom South Africa has confirmed its plans to launch a 5G wholesale network in early 2020, after inking an agreement with Vodacom to utilise Liquid's 3.5GHz spectrum in December 2019, TechCentral writes. Liquid said in a press release: 'Available from early 2020 in all major South African cities, this fifth-generation of mobile internet connectivity will enable wholesale operators to create innovative, ultrafast and scalable digital services for their customers.' Liquid has 56MHz of spectrum in the 3.5GHz band; the only other operators with access to the band are Telkom and Rain. While Rain launched a commercial fixed-wireless 5G network in September 2019, Telkom is yet to reveal its plans regarding the technology.

Ready to Play: Another Polish Cellco Close to 5G Launch

Polish cellco P4, which operates under the name Play, says it has deployed 5G equipment covering the entire city of Gdynia in the north of the country. The firm says its network will utilize 2100MHz spectrum and its commercial launch is just waiting for clearance from the telecoms regulator, the Office of Electronic Communications (Urzad Komunikacji Elektronicznej, UKE). Reuters cites Play's CEO Jean-Marc Harion as saying: 'Technically, we're waiting for UKE to provide us with the authorization to operate spectrum commercially, but this is a real life rollout of 5G. The entire city is covered.' Play was cleared to begin 2100MHz 5G trials in the tri-city area of Gdansk, Gdynia and Sopot by UKE last month. Earlier this week rival operator Polkomtel/Plus announced plans to launch 5G networks in seven cities by the end of March.

Telstra Reaches Milestone for Number of Connected 5G Devices

Australia's Telstra has provided an update on its 5G rollout, ZDNet reports, with the mobile network operator (MNO) revealing at the at CES 2020 trade show that it now has a total of 100,000 5G devices connected to its network. Meanwhile, the MNO was also said to have confirmed that it currently has 800 5G-capable sites, while noting that it is still aiming to extend 5G connectivity to a total of 35 cities by mid-2020. As previously reported by CommsUpdate, Telstra began activating 5G sites in August 2018 but commercial services were not available at the time due to the lack of compatible devices for end-users. Indeed, it was not until May 2019 that the operator announced it had begun selling its first 5G-capable devices for consumers.

DOCOMO, MobiledgeX to Conduct PoC Trials to Verify Worldwide Distribution of 5G Applications

Japan's leading mobile operator by subscribers, NTT DOCOMO, is teaming up with US-based MobiledgeX to conduct a joint proof of concept (PoC) trial in Tokyo to test a solution that 'leverages multi-access edge computing (MEC) for the worldwide distribution of applications'. With the cellco aiming to launch its 5G network this year, DOCOMO will collaborate with MobiledgeX to help a variety of partners distribute innovative 5G solutions worldwide, it said. In a press release, the two parties confirmed that 'MobiledgeX's solution offers a developer portal site for distributing applications to MEC infrastructure, such as servers and storage systems, located on the edges of mobile operator networks that are close to customers in markets overseas. Developers, device manufacturers and other technology partners with stringent performance and data-governance needs will be able to distribute their applications quickly and easily worldwide, without having to confirm usage conditions or system availability in each operator's MEC infrastructure respectively.' Further, the PoC trials will include an augmented-reality (AR) application based on the 'Edge Realities' platform supplied by Poland-based software studio '1000 realities', distributed to the MEC platform, DOCOMO Open Innovation Cloud, connected to 5G and LTE networks operated by DOCOMO in Japan. Edge Realities uses space-recognition technology to superimpose AR content on real objects and large spaces without using place markers. The MEC platform will enable the content to be positioned in space and displayed, without any time lag. Finally, the partners note that Tanseisha and DOCOMO Innovations will support the PoC.

India Operators Select Vendors for 5G Trials

The three major mobile operators in India and state-run BSNL applied to the Department of Telecommunications to conduct 5G trials, with Vodafone Idea and Bharti Airtel opting to use Huawei gear in the tests, The Economic Times reported. Reliance Jio, with a 35 per cent market share by subscribers, is sticking with its existing supplier Samsung, which deployed its 4G network. Second- and third-ranked Vodafone Idea and Airtel will also team with Ericsson, Nokia and ZTE, while BSNL will work only with ZTE, the newspaper stated. In early January, the government gave the green light for all equipment suppliers, including Huawei, to participate in the trials. The country faced continued US pressure to ban Huawei's kit. In June 2019, the Indian government set up a committee to review Huawei's network security and previously expressed reluctance to allow the vendor to deploy its 5G gear, due to fears over back-doors which could allow the Chinese government to spy on users. India plans to hold 5G spectrum auctions by the end of Q1.

TM Completes SA Dedicated 5G Network Mode Test using 700MHz/3.5GHz Spectrum

Telekom Malaysia has announced what it claims is the world's first successful standalone (SA) dedicated 5G network mode test using 700MHz and 3.5GHz (C-band) spectrum simultaneously on a converged 5G core network. In a press release regarding the matter, TM said this latest development followed on from a number of other recent notable achievements, including: the updating of its Radio Access Network (RAN) nodes and devices to support 700MHz SA dedicated 5G network; the deployment of a 700MHz 5G SA dedicated network; and the recording of downlink speeds of 1.5Gbps in tests conducted within its 5G use cases sites. Commenting on the matter, TM's Chief Executive Dato' Noor Kamarul Anuar Nuruddin, said: 'SA is the eventual state of 5G network architecture, brings new 5G capabilities such as ultra-low latency and advanced network-slicing functions, which will open up many new use cases especially for the enterprises. Coupled with 700MHz spectrum, this can ensure increased coverage nationwide, where many new 5G services can be further delivered; thus enabling greater reach to the population towards addressing the digital divide. 700MHz spectrum will enable fast and wide 5G deployment and together with the C-band spectrum, the network will be ready to take on the traffic of multiple network operators, on top of enterprise verticals; living up to our aim to

become the nation's 5G network infrastructure provider.' TM is currently participating in the 5G Demonstration Project (5GDP) being undertaken by Malaysia Communications and Multimedia Commission (MCMC). The telco has already reportedly embarked on a total of eleven use cases in Langkawi, while it has also deployed the operations of an Integrated Operations Command Centre (IOCC), also known as 5G Command Centre (5GCC), in that same district.

Viettel to Launch 5G this Year Using Own Network Equipment

Vietnamese telecoms operator Viettel plans to introduce 5G services in June this year, using network equipment and software developed by itself. The military-run company made the first trial video call using its own equipment last week, stating that it aims

to become the sixth supplier of 5G systems in the world, after Ericsson, Nokia, Huawei, Samsung and ZTE. Following an initial commercial launch expected by June this year, Viettel aims to enable 5G across its mobile network within twelve months.

Jazz Completes 5G Test

Jazz, Pakistan's largest cellco by subscribers, has successfully tested 5G technology, the company has confirmed via posts on social media. The tests were conducted in partnership with Chinese vendor Huawei and reportedly achieved downlink speeds of 1.4Gbps. No further details were disclosed by the operator, however. As previously reported by TeleGeography's CommsUpdate, sector regulator the Pakistan Telecommunication Authority (PTA) published guidelines in July 2019 for the allocation of temporary licenses and spectrum for testing technologies such as 5G.

Polkomtel Plans First Quarter 5G Launch in Seven Cities

Polish cellco Polkomtel, which operates under the Plus brand, has begun rolling out its commercial 5G network, with a launched planned by the end of March this year. The operator, which is part of the Cyfrowy Polsat group, is rolling out 5G equipment using 2600MHz TDD spectrum in seven cities initially: Warsaw, Gdansk, Katowice, Lodz, Poznan, Szczecin and Wroclaw. MIMO 4×4 and QAM256 technologies will be used to provide download speeds in

excess of 500Mbps via approximately 100 base stations at launch. Equipment is being supplied by Ericsson and Nokia. Miroslaw Blaszczyk, President of the Management Board of Cyfrowy Polsat and Polkomtel, commented: 'We have finished preparations and are beginning to build the first 5G network in Poland. These will no longer be tests or trials – they will be commercial services available like all others in our offer.'

Unlocking New Revenue Potential and Reducing Churn for Telecom Operators through Cross-Border Mobile Top-ups with DT One

Thierry Siminger
Chief Commercial Officer
DT One

DT One, a technology company that operates a B2B platform for mobile top-up solutions, bill payments and mobile rewards, helps telcos tap into the booming demand for mobile data in emerging markets.

An increasingly global workforce offers new opportunities for telcos to meet customer demand and increase revenue. For the 250 million migrant workers living outside their home country, staying connected with the families they left behind is vital and the growth in cross-border mobile top-ups – buying airtime or data for a phone in another country – reflects this need.

How telcos are tapping into the mobile data boom in emerging markets
The vast majority of adults in emerging and developing countries either own or have access to a mobile phone, and it's estimated that by 2025, 5.8 billion individuals will be online and many will exclusively use their mobile devices to access the internet. It's no surprise then that customers across the globe are deriving real value from telcos that make buying data or call time for family and friends easy.

DT One, a technology company that operates a B2B platform for mobile top-up solutions, bill payments and mobile rewards, helps telcos tap into the booming demand for mobile data in emerging markets.

Telecom operators who use DT One's platform, make it possible for customers to buy call time or data for family and friends anywhere in the world and send it back instantly. For migrant workers in particular, this is an affordable way to transfer a valuable resource to their families at home and stay connected on instant messaging and social media apps.

For the father working in the Middle East, sending airtime to his son at university in the Philippines means daily voice chats. For the mother

working in the United States, it means the ability to send pictures of the grandkids to her parents in Mexico, and it also means that they can stay connected to their social networks, games and favourite series for longer.

Globally, there is a growing flow in mobile top ups, usually from wealthier countries to emerging markets. Popular corridors include the, UAE to Pakistan and India, Malaysia to Indonesia, South Africa to Zimbabwe and from the UK to Ghana and Nigeria.

Cross-border top-ups offer high margins and churn reduction

One of DT One's key product offerings is phone-to-phone (P2P) cross-border top ups - which give telco customers the option to buy data, call time or text time for anyone in any country instantly as a value-added service. Top-ups can be completed by even the simplest feature phone via text message or dialling short codes, which is particularly convenient for users without internet access. In certain markets, it's also possible for receivers to request top

ups when they need it - ideal for children and family members, when they run out of credit.

For telcos, the benefits are clear. Analysing more than 100 million cross-border transactions facilitated by DT One, typical values per transaction range from US$1-US$20, with most users completing up to four transactions each month. Telcos can decide on a margin that works for their business and is in line with their revenue strategy. For many, mobile cross-border top-ups open a completely untapped revenue stream which is effective at driving engagement with customers and provides a convenient service to users. P2P cross-border top-ups offer a cost-effective service to customers and a unique differentiator for telcos looking to provide additional value to their customer base which has historically been underserved.

However, one of the challenges facing telcos wanting to offer services like this is the complexity of integrating with multiple providers in vastly different countries. This is where networks like DT One's become

P2P cross-border top-ups offer a cost-effective service to customers and a unique differentiator for telcos looking to provide additional value to their customer base which has historically been underserved.

attractive. Rather than having to set up different contracts and agreements, telcos can use DT One as a single point of contact, making integration simple with no licenses or complex set up required.

The simple setup and instant access to an enormous pool of potential users through DT One's network makes cross-border top-ups an attractive value-added service for telcos, answering a practical need for the millions of people living away from their home countries.

Thierry joined DT One in May 2017 as the Chief Commercial Officer to lead the company's global sales operations. Prior to DT One, he worked at SIGFOX where he held the position of Middle East, Africa President and EXCO member. Thierry also holds an MBA from ESACI, and is fluent in English, French, and Spanish.

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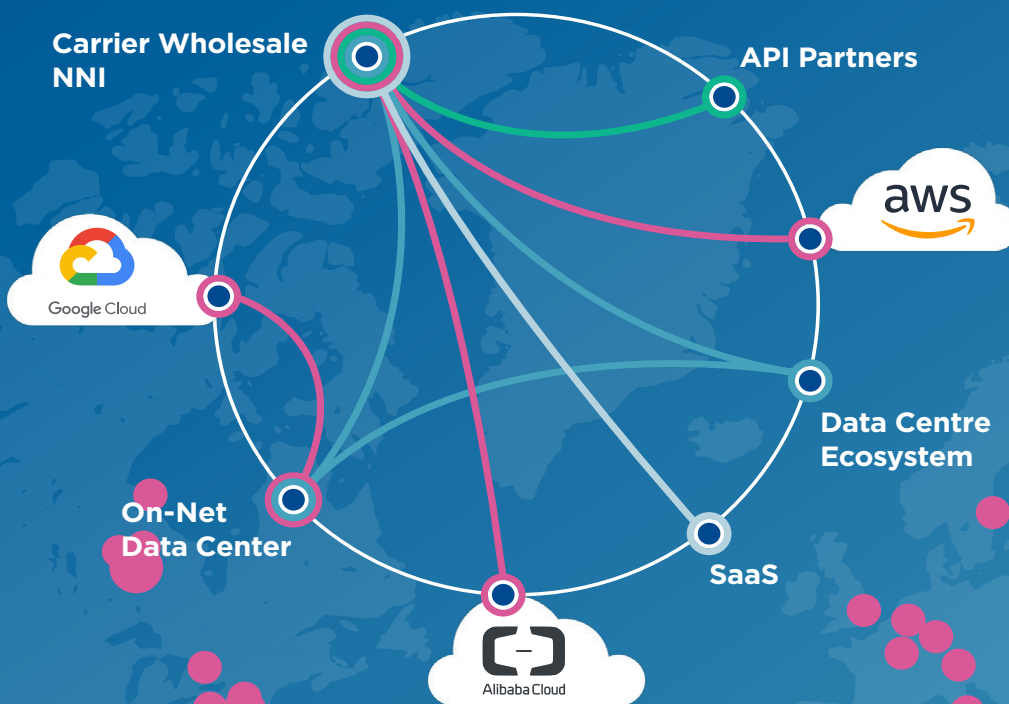
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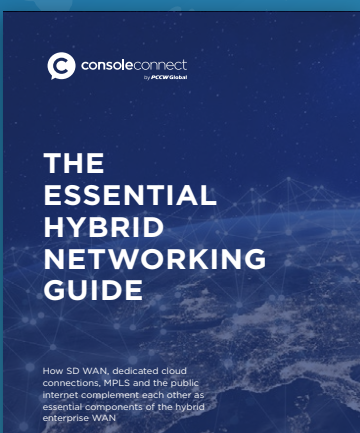
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REGULATORY NEWS

UN Broadband Commission Advocates for Financing Inclusive Meaningful Connectivity for Sustainable Impact

The ITU UNESCO Broadband Commission for Sustainable Development examined new financing models that would help accelerate 'meaningful universal connectivity' on the sidelines of the Annual Meeting of the World Economic Forum in Davos, Switzerland. Today, an estimated 3.6 billion people remain offline. The majority of the unconnected live in least developed countries, where an average of just two out of every ten people are online. The Commissioners agreed that targeted efforts are needed to lower the cost of broadband, as well as innovative policies to finance the rollout of broadband infrastructure to unconnected populations. Collaboration among diverse stakeholders will be key to making universal and meaningful connectivity a reality for all. "We are on the verge of a new era that requires quick, effective and innovative financing instruments to connect the remaining unconnected. The old ways can no longer work in this era and we can no longer afford having anyone left behind," said Paula Ingabire, Minister of ICT and Innovation, Republic of Rwanda, representing President Paul Kagame, who Co-Chairs the Commission. "Expanding avenues for investment in information and communication technology (ICT) infrastructure has always been one of my priorities," said ITU Secretary-General Houlin Zhao. "As we enter a new decade, the last decade to achieve the United Nations Sustainable Development Goals, we need new incentives and financing solutions to create environments that are conducive to investment in ICT. 'Meaningful universal connectivity' encompasses broadband that is available, accessible, relevant and affordable, but also that is safe, trusted, user-empowering and leads to positive impact. It also advocates the need to go beyond 'business as usual' policy prescriptions and projects, and towards more collaborative models based on resource sharing and

holistic approaches. Commissioners and participants also examined ways to address the digital investment gap, policies and incentives for investors and other digital industry stakeholders, and what innovative financing models can be scaled up to expand infrastructure. Among the models highlighted is the ITU UNICEF School Connectivity project, also known as the 'GIGA' initiative. It aims at bringing connectivity to every school in every village around the world to empower young people with the digital skills they need to flourish in the digital economy. The GIGA initiative is anchored in the Secretary-General's High-level Panel on Digital Cooperation's findings which state, that by "2030 every adult should have affordable access to digital networks" and calls for "a broad, multi-stakeholder alliance, involving the UN to create a platform for sharing digital public goods."

The GIGA initiative has four pillars:

- Map connectivity of every school and use it to show where connectivity demand is, and use new technologies

like artificial intelligence (AI) to create a real-time map of school locations and their connectivity level.
- Finance a Common Bid that aggregates connectivity demand in schools (pooled across multiple countries) and creates a cost-forecasting model to make connectivity more affordable.
- Connect every school to the Internet and create a monitoring system to oversee the level and quality of connectivity delivered by internet service providers.
- Empower young people with skills by investing in, and scaling up, open source solutions that – with connectivity – will be available to children, teachers and administrators.

"Digital technologies can dramatically improve the lives of people and communities and deliver on the promise of the United Nations Agenda 2030 to leave no one behind," said Doreen Bogdan-Martin, Director ITU Telecommunication Development Bureau. "Multi-stakeholder collaboration and partnership will be key to connecting the 3.6 billion people still

off-line. We all have to work together and increase our efforts to bring technology to the people, in every area and every walk of life." The Broadband Commission launched the 'Broadband Transforming Lives' campaign at the Davos meeting to mark its 10th Anniversary this year. The campaign aims to showcase the power of broadband on all aspects of people's lives. This is the sixth time that the Broadband Commission has held a session bringing together a myriad of stakeholders attending the World Economic Forum.
Ongoing work of the Commission
The Broadband Commission for Sustainable Development was established in 2010 by ITU and UNESCO with the aim of boosting the importance of broadband on the international policy agenda, and expanding broadband access in every country as key to accelerating progress towards national and international development targets. Led by President Paul Kagame of Rwanda and Carlos Slim Helù of Mexico, it is co-chaired by ITU's Secretary-General Houlin Zhao and UNESCO Director-General Audrey Azoulay. It comprises over 50 Commissioners who represent a cross-cutting group of top CEO and industry leaders, senior policy-makers and government representatives, and experts from international agencies, academia and organizations concerned with development. Learn more at: www.broadbandcommission.org

US Digital Tax Proposal Gets EU Cold Shoulder

Europe is pressing on with its battle to tax technology companies despite France's truce with the U.S. France, Germany, Italy and the U.K opposed a U.S plan to water down an international tax on tech giants by making it optional. Their opposition emerged from behind closed doors in Brussels, where European finance ministers discussed the global tax negotiations, according to five EU diplomats at the meeting. The European Commission also opposes the U.S proposal, which U.S Treasury Secretary Steven Mnuchin put forward in early December. "Tax by definition is a compulsory payment," Commission Executive Vice President Valdis Dombrovskis told reporters after gathering. "That's the approach that we are advocating also in international negotiations." European frustration at the American proposal comes despite a French peacemaking gesture over its national tax. After a phone call between French President Emmanuel Macron and U.S counterpart Donald Trump, Paris said it would suspend collection of its 3 percent levy on digital services until global talks conclude this year. The pause aims to avoid a trade war with the U.S administration, which had threatened tariffs of up to 100 percent on French cheese and Champagne unless Paris scrapped its levy. The truce also aims to give space for international negotiations. Those could be at risk in the new EU-U.S dispute. Next week, January 29-30, representatives of 135 countries are traveling to Paris in search of agreement on a blueprint for a digital tax. The discussions are taking place at the Organization for Economic Co-operation and Development, a global club of the world's developed economies.

Two officials close to the OECD process are now playing down the prospect of a breakthrough and raised doubts that any global compromise would be found before a final deadline in June. One official went further, questioning whether Washington would be willing to compromise in the summer — only months before U.S. voters head to the polls in November. The French Finance Minister Bruno Le Maire is scheduled to meet Mnuchin on the margins of the World Economic Forum in the Swiss Alpine town of Davos. The Frenchman said that the U.S truce will help convince Mnuchin to abandon the American bid to offer companies a safe haven from the OECD deal. "I believe it's a good launching pad," he said, refusing to get into further details when questioned by journalists in Brussels. "Our technical teams are in touch day and night to find a solution." "Our objective was always to have a tax fit for the 21st century," Le Maire added. "This is an objective that is shared with the Americans." Failure to reach an OECD deal this year will reignite Brussels' controversial bid to introduce a tax just for the EU. "If international solution takes time to materialize, the European Commission already has proposed ... an EU-wide solution," Dombrovskis said. That measure appeared dead last year after vetoes from Denmark, Finland, Ireland and Sweden. The EU can make tax laws only by unanimous agreement. At the time, some of the proponents said the EU could revisit the idea after giving the OECD process a chance. But EU governments remain at odds over a position to take in the global talks.

Thai Regulator Ups 5G Auction Expectations

Thailand's regulator raised its forecast for a pending spectrum auction to THB64 billion ($2.1 billion), after the government approved participation by the country's state-owned operators, Bloomberg reported. In addition to private operators AIS, True Move and dtac, state players TOT and CAT Telecom can also now take part in the sale. The National Broadcasting and Telecommunications Commission (NBTC) previously expected the auction to raise about $1.8 billion. The auction is scheduled to take place next month, under plans announced in late 2019. Licenses in the 2600MHz and 26GHz bands will come first, with 700MHz and 1800MHz to be auctioned at a later date. Network rollouts are expected to begin in March. NBTC Secretary General Takorn Tantasith told Bloomberg if three or four operators participate, he expects half of the 56 licenses to be acquired. He added the 2600MHz band will be the most competitive, while acknowledging operators may not bid for 1800MHz. Only two of nine blocks of 10MHz available in the 1800MHz band were sold in a long-delayed 4G auction. Market leader AIS and dtac each bid THB12.5 billion for their respective blocks, with no competitive bids submitted. However, so far dtac is the only private operator to pick up bid documents for the 5G auction. The company said it is conducting a feasibility study of the criteria and procedures for the license, which will be reviewed by its board before a decision is made.

4 SPECTRUM AUCTIONS IN FEBRUARY 2020

Ranges	Total amount of bandwidth	Licences
Remaining 700MHz	15MHz	3
2600MHz	190MHZ	19*
Remaining 1800MHz	35MHz	7
26GHz	2700MHz	27**

Remark

The 2600MHz range will be capped at 10 licences for each winner to prevent the winners from holding two much bandwidth in a range.

**The 26GHz range will be capped at 12 licences for each winner.*

NBTC Declares Neutrality in 5G Gear

The telecom regulator has vowed to remain neutral concerning bids from telecom vendors involved in the nation's 5G roll-out. The 5G spectrum license auction is scheduled for Feb 16 and the network roll-out could commence in May, according to the National Broadcasting and Telecommunications Commission (NBTC). The door is open for telecom operators to choose technologies from various vendors for their networks, which could create better balance and security management, said NBTC secretary-general Takorn Tantasith. "We will ask prospective bidders for cooperation regarding this," Mr. Takorn said. Previously, the regulator attracted both Chinese tech giant Huawei and some US-based vendors to help develop telecom infrastructure and 5G testbed centers in collaboration with major mobile operators. The NBTC maintained its neutrality after the first 5G test centre was established in Bangkok last year. The regulator sought cooperation from Huawei and various US tech firms, including Intel, Cisco, Qualcomm and IBM, to run the 5G tests in Thailand. Huawei has agreed to work with the NBTC and Chulalongkorn University on a test site. Mr. Takorn said representatives of US vendors have met him for talks about the cooperation. "I clearly expressed our neutral policy to them," he said. These vendors helped provide information and took part in events aimed at educating and promoting innovation development in the country, Mr. Takorn said. The NBTC will auction off four spectrum ranges on Feb 16, consisting of 700MHz, 1800MHz, 2600MHz and 26GHz. The regulator expects about 54 billion baht to be generated from the auction. 5G adoption this year could contribute 177 billion baht to the economy, or 1.02% of GDP, the NBTC said. The intake could rise to 332 billion baht in 2021 and 476 billion baht in 2022. The 2600MHz range is coveted in the auction because it is being used for commercial 5G service in China, which is the world's biggest market for mobile subscriptions, Mr. Takorn said. He said the NBTC will urge the auction's bidders to consider the 5G roll-out at Suvarnabhumi and Don Mueang airports as the first priority. The NBTC plans to sign a pact with Airports of Thailand Plc on Jan 22 for the cooperation. "The two international airports will serve as a flagship and national gateway for 5G tech adoption in Thailand, where visitors will get a hands-on experience of ultra-fast wireless broadband service once they arrive," Mr. Takorn said. Several 5G use cases are expected at the two airports' operations, including facial recognition, smart security, smart logistics, smart hospitals and smart transport, he said.

ANCOM Fines Mobile Operators for Non-Fulfilment of Coverage Obligations

Romania's National Authority for Management and Regulation in Communications (ANCOM) has fined RCS&RDS (DIGI), Telekom Romania Mobile Communications, Vodafone Romania and Orange Romania a total of RON1.61 million (USD373,693) for failing to respect their obligation to provide mobile voice coverage to at least 98% of the country's population. The regulator's survey conducted between May and September 2019 determined that Orange Romania covered 97.81% of the total population, Vodafone Romania 97.76%, Telekom Romania 96.53% and RCS&RDS 95.42%. As a result, RCS&DCS received a sanction of RON800,000, Telekom Romania RON700,000, Vodafone RON60,000 and Orange RON50,000. Under the terms of their radio spectrum licenses, Orange, Vodafone and Telekom Mobile were obliged to cover at least 98% of the population with voice services through their own radio access network by 5 April 2017, and RCS&RDS by 5 April 2019.

Ofcom Promises to 'Supercharge' Fiber with Four-Point Plan

Telecoms regulator Ofcom has proposed a four-point plan to accelerate investment in fiber networks at interest continues to gather momentum in the UK. In what could turn out to be a catalyst to gather further momentum in the market, Ofcom has revealed a four-point plan to accelerate deployment. Interest in fiber connectivity has certainly increased across the country, though BT and Openreach have called for regulatory reform to further aid aggressive deployment plans. The plan is now open for consultation, with Ofcom set to publish its decision in early 2021 before the current rules expire in April 2021. Firstly, caps will be placed on wholesale prices to encourage competition from new networks. Secondly, Openreach will be prevented from applying drastic discounts which could stifle competition. More flexibility will be offered in the rural regions to encourage investment however, and finally, Ofcom will deregulate Openreach's copper products in areas where full fiber is built to help Openreach retire the network. "These plans will help fuel a full-fiber future for the whole country," said Jonathan Oxley, Ofcom Interim Chief Executive. "We're removing the remaining roadblocks to investment and supporting competition, so companies can build the networks that will drive the UK into the digital fast lane. "Full-fiber broadband is much faster and more reliable. It's vital that people and businesses everywhere – whether in rural areas, smaller towns or cities – can enjoy these benefits. So, we're making sure companies have the right incentives to accelerate full fiber to every part of the UK." Compared to other

Ofcom's plan to help bring full fibre nationwide

1. Improving the business case for fibre investment
2. Protecting customers and driving competition
3. Taking rural areas into the fast lane
4. Closing the copper network

nations across the European bloc, the UK is in somewhat of sluggish position. Pointing the finger towards investments in G.Fast broadband upgrades as opposed to the more expensive, but longer-view, fiber products has generally been accepted as the main reason. According to OECD estimates, only 1.92% of total broadband connections in the UK are fiber, which leaves the state in a comparatively unattractive position. "Today's proposals appear to be a big step in the right direction to give clarity and investment certainty," an Openreach spokesperson said. "Like the Government and Ofcom, we want to upgrade the UK to faster, more reliable full fiber broadband. We're getting on with the job, building to 26,000 premises each week and we remain on track to reach 4m homes and businesses by the end of March 2021. "We'll consider the range of proposals carefully and will continue to work with Ofcom and industry on getting the conditions right to help achieve the Government's ambition of rolling out gigabit capable broadband across the UK as soon as possible." Although some might question the need for such speed, it won't be too long before applications emerge which drive data usage through the roof. Let's not forget, in 2010 average fixed broadband speeds were 5.2 Mbps, satisfactory at the time but horrifying for the consumer of today. Average speeds in 2019 were 22.37 Mbps and it will not be long before these are considered below par. Aside from speed, it is also worth noting that fiber broadband connectivity also offers a very useful boost to reliability. "It's good to see Ofcom using its powers as a regulator to stimulate competition, drive investment and improve outcomes for consumers," said Ed Dodman, Director of Regulatory Affairs at Ombudsman Services. "Many of the broadband complaints we handle from consumers and small businesses are to do with issues around speed and reliability, so we support proposals that will lead to improvements in these areas across the UK." Although

the OECD statistics do not paint the prettiest of connectivity pictures in the UK, momentum has been shifting in the right direction. From a political perspective, the idea of gigabit speed broadband has taken hold. It might turn out to be nothing more than empty campaign promises, but it has raised the issue of fiber connectivity and the digital divide to the national conversation. Looking at the consumer, there is certainly more appetite. This will be partly down to the consumer being more educated on the different connectivity options, Ofcom rules killing off dubious and misleading fiber claims from ISPs and the price of fiber connectivity dropping in recent years. And thanks to increased demand from the consumer, the UK fiber landscape is looking like a more attractive investment. Goldman Sachs purchasing CityFibre is evidence of this, but other financial players are becoming increasing interested in communications infrastructure as a long-

term investment. Securing additional funds from third-parties is becoming a critical component of the mix, especially with more alt-nets appearing. In the short-term, the emergence of 'alt-nets' should only be viewed as a good thing. More providers will create more value for the consumer through increased competition and providing the telcos incentive to invest in fiber. However, you have to wonder whether the number of alt-nets in the UK is sustainable in the long-run. The more providers there are, the more fragmented a market becomes. Fragmentation is the enemy of scale, making it more difficult to aggressively pursue expensive investments. There is of course a risk of over-build in certain markets, though the presence of these alt-nets creates an interesting M&A future for the UK. CityFibre is a primary example of what happens when a market becomes too fragmented. This is a company which only exists

because it was able to acquire several distressed fiber players and merge them into a single business. Some ambitious and cash-rich parties might look at the potentially fragmented market in the UK as another opportunity to consolidate and create another scaled player at some point in the future. Although this move should not be considered the silver bullet from Ofcom, it is certainly very encouraging. The UK telecoms industry has been calling for regulatory reform for some time in pursuit of greater levels of certainty as well as a more favorable investment climate in the UK. What we have here is an excellent example of collaboration. For the digital society of tomorrow to be more than a pipe dream, industry will have to come together with the investment community and Government, presenting a united front. This proposal is perhaps evidence the rhetoric is perhaps evolving into reality.

Malaysia Details 5G Spectrum Assignment Plan

Malaysia's telecoms regulator confirmed plans to allocate 5G spectrum across four bands, with commercial deployments

expected to begin by the third quarter of 2020. Following a public inquiry and release of a final report in September last year, the Malaysian Communications and Multimedia Commission (MCMC) identified the 700MHz, 3.5GHz, 26GHz and 28GHz bands as spectrum frequencies for the rollout of 5G. Taking a new approach, MCMC is considering allocating the 700MHz and 3.5GHz bands to a single entity comprising a consortium formed by multiple licensees, instead of individual licensees, in an effort to lower capex by minimizing costs and preventing the duplication of infrastructure. It will hold a tender. Initially it will assign only 2x30MHz in the 700MHz band and 100MHz in the 3.5GHz band. Frequencies in the 26GHz and 28GHz bands will be considered for assignment at a later date. MCMC said the existing allocation of 4G spectrum will be maintained, which includes the assignment of the 2.3GHz and 2.6GHz bands until December 2021, with a review of these bands planned in 2021.

Chad Exempts Internet Services from Cellco Tax

The Chadian government has exempted fixed communications and internet services from a levy on monthly turnover as part of its 2020 budget, approved by parliament in late December 2019. The new budget – officially the Finance Act

2020 – revised Article 28 of the document to exclude fixed communications and internet services from an 18% tax on the monthly revenue reported by mobile operators. Separately, the bill adjusted the tax structure for towers (Article 826) so

that sites in areas targeted by the universal service fund (USF) are no longer subject to fees, which range up to XAF2.5 million (USD4,240) per year, depending on the location.

A SNAPSHOT OF REGULATORY ACTIVITIES IN SAMENA REGION

Afghanistan

Afghanistan Telecom Regulatory Authority (ATRA) generates a considerable amount of revenue to the Afghan government, particularly, since the approval of a 10% levied tax on telecom services, and 2.5% on the net incomes of the telecommunication company sales. According to reports from the Ministry of Finance of the Islamic Republic of Afghanistan, ATRA has transferred Afs 878 million ($11.3mn) to the special account of the Ministry of Finance, allocated to be spent through the national budget on a priority basis. These revenues come from 2.5% on the net incomes of the telecommunication company sales and will be spent on certain projects, including ATRA's development project and more. In the meantime, some lawmakers have great concern over lack of transparency and accountability in the transfer of money from the government institutions to the Ministry of Finance. According to some financial experts, the existence of massive corruption causes an ambiguity among government bodies in the proper allocation of the national budget. Lack of transparency in transferring and spending budget made lawmakers form a special commission to conduct comprehensive research into the two emergency funds (Code 91 and Code 92). The assigned commission will also investigate the transfer of Afs.15 billion from Da Afghanistan Bank (Afghanistan's Central Bank) to the Ministry of Finance and the Lack of transparency in the collection of 10% levied on telecom services. (January 13, 2020) khaama.com

Bangladesh

The High Court has ordered Robi Axiata Limited to settle BDT1.38 billion (USD16 million) of the BDT8.67 billion claimed by the Bangladesh Telecommunication Regulatory Commission (BTRC) as unpaid dues in its 2019 audit of the telecoms operator. The firm was ordered to pay the sum in in five instalments. As previously reported by TeleGeography's CommsUpdate, in Q1 2019 the regulator requested that Robi Axiata and rival GrameenPhone (GP) pay dues totaling BDT8.67 billion (Robi) and BDT125.80 billion (GP), which were detected in its 2019 audit and were disputed by the two operators. The cellcos subsequently demanded an arbitration, but the BTRC denied the request, claiming that legislation did not allow it. Due to the impasse with the BTRC, the two operators were banned from getting approvals for new services and packages and could not import equipment to maintain their networks. In July 2019 the BTRC slashed GP's bandwidth by 30% and Robi's by 15% for the non-payment of the dues, but the block was lifted by mid-July as it was causing issues to subscribers. Further, the BTRC threatened GP and Robi Axiata with cancellations of their 2G/3G concessions if the requested sums were not settled, prompting the cellcos to file cases with a Dhaka court, seeking permanent injunctions against the telecom regulator's audit claims. Elsewhere, the BTRC is now planning to audit the country's third largest operator by subscribers Banglalink. The BTRC has launched the process of selecting an audit firm, with interested companies given until 4 February to submit their proposals. A previous attempt to audit Banglalink was abandoned in 2017 for unknown reasons.
(January 7, 2020) Dhaka Tribune

The telecom regulator is set to recommend slash in international incoming voice call rate by 65.71 percent to $0.006 a minute in the face of fast shrinking earnings from the segment in recent years. Industry insiders said a significant portion of international calls were now being made through internet-based communication platforms such as WhatsApp, Viber, Messenger, Imo, Skype and WeChat, which cost nothing other than the price of data. Mobile operators also run promotional campaigns of these applications, for which relatives of expatriates have gradually grown the habit of using the apps. Bangladesh Telecommunication Regulatory Commission took the decision in a recent meeting following a proposal of IGW Operators Forum (IOF), said Md. Jahurul Haque, Chairman of the commission. International Gateway (IGW) operators are responsible for the termination of international voice calls in Bangladesh from other countries. Legal voice calls have currently gone down to about two crore minutes a day, which was some 10 crore minutes a few years back. Termination of international calls was one of the main sources of earnings for the government even five years back. But it has shrunk substantially in recent years. In fiscal 2014-15, the government's earning from such calls was Tk 2,075.62 crore, which declined to Tk 1,387.37 crore, Tk 967.63 crore, Tk 900.35 crore and lastly to a few hundred crore taka in the successive years respectively, according to

BTRC officials. A top placed source also said the IGW operators had formed a cartel to increase incoming call rates without taking approval from neither the regulator nor the government. That made calls to Bangladesh pricey. Voice calling through free applications would rise further in Bangladesh with the rise in penetration of smartphones and mobile broadband coverage, said Mushfiq Manzur, Chief Operating Officer of the IOF. This will contribute to the decline of paid incoming international calls, he

said. However, as it has been noticed in other mature markets, OTT [over-the-top] calls will not wipe out the entire (volume of) paid international calls but a sizeable portion. Businesses will continue to use paid service for better quality as long as the prices remain competitive, Manzur added. Currently, there are 24 IGW operators in Bangladesh. Licenses of six were cancelled for unpaid dues. (December29, 2019) thedailystar.net

Egypt

The mobile market added about 357,700 new subscribers last October, bringing the total number of mobile subscribers from 94.8 million in September to 95.2 million, according to the Ministry of Communications and Information Technology. Vodafone managed to add about 230,000 new subscribers to its network last October, increasing the number of its customers from 39.9 million subscribers in September to 40.2 million subscribers. Orange was able to add about 37,900 new subscribers to its services last October, increasing the number of subscribers to its services from 28.2 million subscribers last September and reaching 28.3 million. According to the Ministry, Egypt Telecom

lost about 100,000 subscribers in October, as the number of subscribers to the company's services declined from 20 million in September to 19.9 million in October. The mobile market had added 140,000 new subscribers last September, bringing the number of subscribers to 94.9 million in September. The mobile market witnessed a decline in the number of its users in the past year, after the National Telecom Regulatory Authority (NTRA) checked user data to remove unregistered lines. In addition, the high price of mobile lines up to EGP 70, as a result of imposing a new fee of EGP 50 per mobile line since the middle of last year, affected the number of mobile users. (January 18, 2020) dailynewssegypt.com

Jordan

The activities of the workshop on "Regulating the Fifth Generation of Mobile Communications" started by the Telecommunications Regulatory Authority in cooperation with Ericsson in the presence of the Chairman of the Board of Commissioners, Dr. Eng. Ghazi Jabour, experts from Ericsson, and a number of the Authority's employees concerned. Dr. Eng. Ghazi Al-Jabour appreciated Ericsson's efforts in holding this workshop, stressing the importance of informing the authority's employees of the latest developments taking place globally in the field of fifth generation services and the possibility of benefiting from them and applying them at the local level. Several workshops were held on the same topic in previous times, especially as the authority has already begun preparing to provide these services in the future. The workshop covered specialized topics, including: fifth generation

technology, the role of the fifth generation in contributing to the development of the digital economy, a review of global best practices in the field of using the necessary spectrum for the provision of fifth generation services, in addition to a review of global best practices in this field. It is worth noting that the fifth generation technology is characterized by high speeds to transfer big data and its integration with advanced technology based on modern technologies, in addition to providing the necessary infrastructure to link productive and service sectors such as health, education and industry, which qualifies it to be a platform that supports the transition to the digital economy and the concepts of the industrial revolution Fourth, its future applications. (January 8, 2020) trc.gov.jo

Morocco

Morocco reached 24.5 million mobile internet subscriptions at the end of September, up 8.8 percent year-on-year, according to the latest quarterly report from telecom regulator ANRT. Including fixed broadband connections, the country's overall internet base

increased by 9.0 percent to 26.2 million. This takes the internet penetration rate to 73.6 percent. Morocco's three mobile networks closed the quarter with a combined mobile telephony base of 47.5 million, up by 3.2 percent year-on-year. Postpaid customers

continued to rise at a steady pace (+21.5%), accounting for 9.4 percent of total mobile connections. LTE subscriptions remained on a strong upward trend (+48.8%), reaching 13.4 million at end September or 55 percent of the mobile internet base. In the fixed broadband segment, ADSL customers rose 4.7 percent to 1.5 million, while the number of FTTP lines increased to 105,000. Maroc Telecom retained a strong lead over rivals in the internet segment, accounting for 53.0 percent of combined fixed and mobile internet connections (down from 53.7% in Q2). Orange Morocco saw its market share increase by 0.6 percentage points since Q2 to 22.6 percent, while Inwi remains broadly stable at 24.4 percent. Looking at the overall mobile market, Maroc Telecom held 42.6 percent of total mobile connections (down from 43.2 percent in Q2). Its rivals Orange Morocco and Inwi both gained ground marginally, ending September with a market share of 34.7 and 22.7 percent respectively. (January 5, 2020) telecompaper.com

Nepal

The Nepalese government has overturned the Nepal Telecommunications Authority's (NTA) decision to revoke the licenses of telecom service providers Smart Telecom and Nepal Satellite Telecom (NST) and the ISP WebSurfer for non-payment of fees, reports a Telecoms Ministry official. During a cabinet meeting on 6 January, it was decided to allow the three companies to continue to operate and pay their outstanding liabilities in two instalments over twelve months. According to the NTA, Smart Telecom owes NPR2.3 billion (USD19.8 million) in frequency royalties, license fees and other contributions, NST NPR827 million and WebSurfer NPR37 million.

(January 8, 2020) The Himalayan Times

Nepal Telecommunication Authority (NTA) and Nepal Telecom (NTC) have inked a deal for the optical fiber network in Karnali and Far-Western region. They also agree to use the Rural Telecommunication Development Fund (RTDF) to extend the optical fiber network for the Mid Hill information highway. A program was held on January 3, 2020, Friday in the Capital for the agreement. In the program NTA Chairman, Mr. Purshottam Khanal and Managing director of Nepal Telecom, Mr. Dilliram Adhikari signed the agreement letter. On that occasion, Chairman of NTA, Mr. Khanal expects Nepal Telecom would complete the project on time that will help to establish the foundation for building Digital Nepal. He also expressed that the project will aid in the sharing of the infrastructures in Nepal. Similarly, Managing Director of Nepal Telecom, Mr. Adhikari believed such projects would play an important role in expanding communication facilities in rural and challenging places like Karnali and Far-Western region. Similarly, he also committed to providing a good quality network that is up to the standards. According to the agreement, they will target to build the Optical Fiber Backbone Network in the two provinces. The optical fiber will connect the districts headquarters, municipalities of Karnali province and Far-western province. Optical Fiber network expands from Musikot, Rukum to Jhulalghat, Baitadi. The fiber connects to districts of Karnali Pradesh and Sudur-paschim Pradesh in total of 20 districts including Banke and Bardiya. In the project, they will use ADSS Fiber and Direct Buried Cable (DBC) along 2400 Km. Similarly, they will expand the optical fiber network using DWDM, router, and even microwave. The network in Mid-hill highway, East-West highway, North-South Highway and Postal highway will have a minimum of 96 core fiber. Similarly, they will use at least 48 and 24 core optical fiber in district headquarters and municipalities respectively. Looking at the current and future demand of voice and data, the optical fiber network will have a capacity of up to 400 G with Multiple 100G's. Similarly, multiple 10G capacity router would be used to expand the capacity up to 100G. The information highway built from the optical fiber network would prove to be an important landmark to fulfill the plan of digital Nepal. Similarly, it would reduce the double investment in telecommunications infrastructures through the re-use of already established infrastructures. Such nationwide infrastructures would play an important role in making telecommunication services and technologies dependent on telecommunication (like E-governance) cheap, easily available and reliable. Nepal Telecom will issue a tender under the estimated amount of 3 Billion and 8.1 million through the Rural Telecommunication Development Fund (RTDF). As per the official information, the tender will be published within three months. After the contact, Ntc will complete the infrastructure project within 2 years of the contract agreement. Nepal Telecommunication Authority and Nepal Telecom had an understanding on December 5 to agree on this project within a month. For which they have succeeded to complete the agreement in the stipulated time. The company is currently expanding optical fiber networks under Mid-Hill highway on Province 1, 2 and 3. (January 5, 2020) nepalitelecom.com

Oman

The Ministry of Technology and Communications signed an agreement to launch Oman's first specialized cybersecurity accelerator, in cooperation with the Oman-Britain digital center and Takween, the annual investment program affiliated to Oman Technology Fund. The project is a brick stone in the nascent MENA region and it aims to support companies operating in the

cybersecurity sector. The program, dubbed Sas Accelerator, has been designed especially for individuals and groups to serve as a business think-tank, which provides for the development of business ideas in the field of cybersecurity and the encouragement of digitalized entrepreneurship, with scopes for improving work models, building leadership skills aimed to enable participants to take steps necessary for the growth of their firms. The pact was signed by Hassan bin Fida Al Lawati, Director General of the Digital Community Development Sector at the Ministry of Technology and Communications, and the adviser of the British Embassy in Muscat. (January 11, 2020) timesofoman.com

Ali bin Khalfan al Jabri, Under Secretary of the Ministry of Information, gave an orientation lecture in Majlis Ashshura on the Sultanates Media Policy, and the role of the Ministry of Information in various aspects related to the media sector, new media, compiled books publications and other competencies assigned to the Ministry. The lecture was attended by Shaikh Ahmed bin Mohammad al Nadabi, Secretary-General of Majlis Ashshura and a number of members of Majlis Ashshura. The Information under-secretary focused on clarifying the balanced media policy of the Sultanate, indicating that the Ministry is responsible for organizing the media sector in the Sultanate, monitoring the implementation of the media policy and preparing plans and training programs. Al Jabri stressed that the Ministry has recently finished drafting a unified media law aimed at gathering various types of media under the umbrella of a single law. He added that in the next stage, the Ministry will also regulate the electronic media under Community

Media Centre which conducts scientific studies in cooperation with Sultan Qaboos University. He also touched on the role of the Oman News Agency (ONA) in broadcasting the official news with all credibility. He said that it has expanded its activity gradually and significantly, as the number of its local correspondents reached 55, in addition to 11 external correspondents. He also referred to the Press and Publications Law, as well as the Publications and Publishing Committee, which is supervised by the Ministry. In the field of external media, he explained that the Ministry has made a great effort in this field. During the past year, about 256 journalists from different countries of the world visited the Sultanate. In addition to the Sultanates participation in many book fairs in various countries, including Paris Book fair and Brunei Book Fair, where the Sultanate was the Guest of Honor. He added that the Sultanate is seeking to participate in the Frankfurt International Book Fair during the upcoming sessions of the exhibition, which will be a cultural achievement by the Sultanate at the international level. On the media side, Al Jabri said that the Ministry launched a media platform that is a huge electronic portal with very rich content. He added that it contains the Royal Speeches of His Majesty Sultan Qaboos, in addition to all copies of Oman Book, issued by the Ministry of Information. The portal has links for the Oman News Agency, newspapers, the Public Authority for Radio and Television and the private radio stations. It was launched in three languages, Arabic, English and French. He added that hopefully it will include other languages. At the end of the lecture a discussion was held on developing the media aspects.
(January 7, 2020) zawya.com

Pakistan

Pakistan Telecommunication Authority (PTA) has planned to procure automated quality of service (QoS) monitoring and benchmarking tool which would also have support measuring audio and video services, including live streaming as well as social media, including emerging over-the-top (OTT) communication services testing. According to the official documents, the automated system will bear the specifications including the capacity to test and benchmark QoS across number of mobile operators (i.e. simultaneous and continuous measurement of at least five mobile networks), with the objective to reproduce end user experience in different mobile networks, device types and wireless technologies (i.e. 2G/3G/4G) operational in Pakistan. The system will have data collection and data analysis (post processing) modules and related services to benchmark voice, SMS and data QoS KPIs for at least five operators simultaneously and will have the capability to expand to include more operators, if required. It would have the capability to perform field tests, measure, benchmark and report QoS Key Advance Indicators (KPIs) as defined in mobile services licensees issued from time to time to cellular mobile operators (CMOs) in Pakistan, as well as global industry standards and best practices. The system will be required to measure all the QoS KPIs and should support all the

technologies including but not limited to Global System for Mobile (GSM)/ Code Division Multiple Access (CDMA)/ Wideband Code Division Multiple Access (WCDMA)/ High Speed Download Packet Access (HSDPA)/ High Speed Upload Packet Access (HSUPA)/ High Speed Packet Access+ (HSPA+)/ Long Term Evolution (LTE)/ Voice over Long Term Evolution (VoLTE)/ Long Term Evolution Advance (LTE-Advance) etc, (i.e. 2nd, 3rd & 4th generation wireless technologies) in all bands/spectrum, carrier aggregation in contiguous/noncontiguous bands/technologies and should be upgradeable to 5G. The equipment would be able to determine and plot the route and map it with respect to its GPS coordinates. Plotting will only show the relative movements with reference to a starting reference point. The equipment should be interface able with off-the-shelf digitized map of the region, at any time in future with minimum hardware and software up-gradation. All instances have to be time and day stamped. The system should have power measurement accuracies of up to ± 1/2 dB (min). The system should have time dependent measurements accuracies of one-second minimum. The specification will explicitly indicate the minimum and maximum levels which can be measured by such an instrument. The system should have an extension for indoor / walk test service quality and coverage measurement. The system

would have capability of being up-gradable to consider upcoming mobile network technologies and related Advance parameters, such as VoLTE and 5G etc and active and optimized power control for phone charging. The installation of the QoS system should be in such a way that the set up provides optimal conditions for uninterrupted data collection in a stable environment for reliable test results. The equipment should be capable of benchmarking multiple scenarios of voice, SMS and data services of least five networks simultaneously and continuously. Moreover, it should have capability to expand and include more operators, if required. It should support both perceptual evaluation of speech quality (PESQ) and perceptual objective listening quality analysis (POLQA) voice/ video quality mean opinion score (MOS) for both narrow and wide band. The system would support application based testing like, Facebook, Twitter, Snapchat, WhatsApp, Netflix etc and should provide flexibility to support multiple device types of multiple vendors including but not limited to smart phones, modems and mini-cards etc. It should be able to benchmark all possible testing scenarios in auto technology and locked mode. All the technologies 2G/3G/4G and all the bands can be locked also there should be flexibility to lock/unlock any desired technologies. Further, the tool should be able to lock and test specific Broadcast Control Channel (BCCH)/ Primary Scrambling Code (PSC)/ Physical Cell Identity (PCI)/ Absolute Radio Frequency Channel Number (ARFCN)/ Universal Mobile Telecommunication Service (UMTS) Absolute Radio Frequency Channel Number (UARFCN)/ Evolved Universal Terrestrial Radio Access (E-UTRA) Absolute Radio Frequency Channel Number (EARFCN). It should support minimum 16 handsets for Voice, SMS and Data services simultaneously, besides have the capability to benchmark data services of all the operators simultaneously without any dependency on laptop's modem and without any degradation. The system should have ability to load Geo Maps, Google Maps, tab/shape and network files etc. Any parameter can be exported in multiple formats like CSV, Txt, Tab, KML/KMZ, etc, both as image and point. (January 1, 2020) brecorder.com

Pakistan Telecommunication Authority (PTA) has revealed that the number of 3G/4G users in Pakistan reached 74.33 million by end November compared to 73.26 million by the end of October.

Number of mobile phone users in Pakistan reached 164.027 million by end November compared to 162.98 million by end October, which registered an increase of 1.047 million during the period under review. Jazz's total count for 3G users stood at 12.047 million by end November compared to 12.255 million by end October, registering a decrease of 0.208 million. Jazz 4G user numbers jumped from 13.821 by end October to 14.505 million by end November 2019. Zong 3G subscribers decreased from 7.751 by end October to 7.633 million by end November while the number of 4G users jumped from 14.221 million by end October to 14.702 million by end November. The number of 3G users of Telenor network decreased from 8.032 million by end October to 7.935 million i.e. registering a decrease of 0.097 million. The number of 4G users jumped from 8.052 million by end October to 8.432 million by end November. Ufone 3G users decreased from 6.695 million by end October to 6.454 million by end November. The number of 4G users of Ufone increased from 2.430 million by end October to 2.628 million by end November. Teledensity for cellular mobile reached 77 percent by end November. The broadband subscribers reached 76.38 million by end November compared to 75.30 million by end October 2019. PTA received 6986 complaints from telecom consumers against different telecom operators including (cellular operators, PTCL, LDIs, WLL operators and ISPs) as of November 2019. PTA said that it was able to get 6960 complaints resolved i.e. 99 percent. Cellular mobile subscribers constitute major part of the overall telecom subscriber base, therefore, a maximum number of complaints belong to this segment. The total number of complaints against CMOs by November stood at 5980. The total of 2492 complaints were received against Jazz which is 41.67% of the total CMO related complaints. Telenor, which has the second-largest number of consumers, was also second with 1576 i.e. 26.35 percent complaints were received against it. Zong stood third with 1047 complaints i.e. 17.50 percent of total complaints. Ufone had 865 complaints against its various services which make up 14.46 percent of the total CMO related complaints. PTA also received 345 complaints against basic telephony where 341 were addressed during November 2019. Further 642 complaints were received against ISPs where 635 were addressed.

(December 31, 2019) phoneworld.com.pk

Saudi Arabia

The Communications and Information Technology Commission (CITC) tendered 2 new mobile virtual network operators (MVNOs) licenses to the Saudi telecom operators, according to an official statement. "These licenses will likely boost investment opportunities in the telecom industry, support entrepreneurship and enhance content industry as well as service diversification," CITC Governor, Mohammed Altamimi said. The statement added that the licenses aim to enhance the business environment, promote competition in the market, and foster the adoption of international best practices across the industry. They will also

generate new jobs, enhance innovation in the services provision and make more options available to telecommunications and information technology end users in Saudi Arabia, according to the statement. Interested bidders should submit their offers by May 10, 2020.

(January 12, 2020) argaam.com

The Communications and Information Technology Commission revealed a number of qualitative leaps achieved by the telecommunications and information technology sector in 2019

with the aim of building and strengthening the infrastructure and improving the quality of service so that modern technologies can be deployed and user experience be improved, including the number of towers that support fifth generation technologies reaching 5,200 base towers in more than 30 cities around the Kingdom. This technology will contribute to providing digital infrastructure for many innovative services in addition to enabling the fourth industrial revolution and adopting emerging and modern technologies. These achievements also included the Kingdom's second ranking in the list of G-20 countries for the total allocation of frequency bands identified globally for the provision of mobile communications services, and according to

reports and statistics on the allocation of frequency bands by G-20 countries. The Kingdom was second after Japan ahead of the United Kingdom, Germany, Italy and Canada, and the rest of G-20 countries as the total frequency bands allocated to provide communication services reached (1110) MHz. The International Telecommunication Union (ITU) commended the kingdom's regulation of the telecommunications and information technology sector which achieved an advanced position in the indicators of global competitiveness as the Kingdom advanced (16) positions globally in this regard. (January 1, 2020) spa.gov.sa

United Arab Emirates

The Telecommunications Regulatory Authority (TRA) held a direct consultation session with its partners on the UAE ICT and Telecom Policy. The session took the form of an interactive workshop during which the entities representatives exchanged views and opinions on various aspects of the proposed policy. The workshop, which was held at the TRA Dubai, was chaired by H.E. Hamad Obaid Al Mansoori, TRA Director General. AL Mansoori delivered a welcome speech during which he stressed on the importance of government participation and team spirit to provide an ICT policy that takes into account all relevant aspects in the telecommunications sector for the coming ten years (2020 - 2031). The development of the policy is one of the tasks entrusted to TRA according to Federal Law No. 3 of 2003 (Telecom Law) and its amendments. Furthermore, TRA engages relevant government entities in developing and updating the policy based on the principle of participation for the aim of supporting the national goals in various sectors. The policy aims to draw a road map for ICT sector for the next ten years, including pillars and topics that require concerted efforts to reach the aimed goals and objectives, in line with the aspirations of our wise leadership. The workshop discussed the results of TRA consultation launched on its website on the policy and its amendments. The opinions and ideas submitted by several government and private entities to TRA were compiled and discussed by the participants in the workshop, to be considered in developing the UAE ICT and Telecom Policy, to keep pace with the rapid changes in the vital ICT sector. The policy was developed under the slogan "a smart and happy nation", in line with the higher goals of the government to achieve happiness for everyone in the UAE, and to apply the concepts of smart cities in the era of the fourth industrial revolution, artificial intelligence and big data. This move also coincides with the beginning of 2020, the year of preparation towards the next 50, as per the declaration of out wise leadership. In his opening speech, H.E. Hamad Obaid Al Mansoor, TRA Director General, praised the team spirit reflected in the participation of TRA partners in transforming policy into general consultation, to be the result of comprehensive community participation. He said: "This policy reflects the expectations of the UAE ICT sector in the UAE future journey, and

sets the road map for the sector during the next ten years. 2020 is the year of preparation for the future, the year of Expo, the year of the 5G implementation, the year of implementation of the national cybersecurity strategy, and the year of the UAE ICT and Telecom Policy " H.E. Al Mansoori added: "The ICT and Telecom sector is a dynamic and constantly changing sector. We have witnessed in the past few years the great boom in this field such as the intensive employment of robots, artificial intelligence, nanotechnology, quantum computing, biotechnology, the Internet of things, 3D printing, autonomous vehicles, and others. This policy comes at the right time, raising an important slogan: "a smart and happy nation". With your efforts, and all our cooperation, this policy will be a great support to the preparations for the coming fifty years, in implementation of the directives of our wise leadership." The UAE ICT and Telecom Policy reflects the UAE aspirations to maintain progress in the ICT sector, in order to continue the successes achieved in this vital sector, as it has held many advanced rankings in various regional and global indicators, which enhances economic and social growth and achieves happiness and the welfare of society. The policy will contribute to achieving the vision and directions of the government in this vital sector to reach a "smart and happy nation". The UAE ICT and Telecom Policy includes the highlights of the policy, its mains pillars, the role of innovation and future foresight in the ICT sector, taking into account the National Innovation Strategy and the Future Foresight Strategy. The UAE government emphasizes the pivotal role of the ICT sector in the smart transformation of society, the strategy also highlights some future trends of the ICT sector.
(January 20, 2020) zawya.com

The Executive Team for Online Services Index (OSI), an indicator of the UAE Vision 2021 National Agenda, held its twenty-sixth meeting, under the slogan "Together towards the first place". The meeting, which is the first for 2020, was held at TRA Dubai office, headed by H.E. Salem Al Housani, Acting Deputy Director General for Information and e-Government Sector and Head of the National OSI Executive Team, and attended by members of sub-teams representing various local government entities in the UAE.

This meeting aims to review the team's highlights for 2019, and the level of achievement in standard initiatives. It also included a session for innovation and future foresight. The meeting started with a presentation made by the head of the national team, in which he reviewed the highlights of last year, including the field visit to Sweden and learning about the Swedish practices in smart cities and digital transformation, the interactive meeting on Twitter, the launch of the One-Character Domain (U.ae) initiative , The National Digital Transformation Report, the launch of the enablement tools for the Fourth Industrial Revolution, and the Hackathon 2020 Challenges Workshop. Commenting on this meeting, H.E. Al Housani, said: "Through this meeting, the National OSI Executive Team continues its efforts for achieving the UAE vision 2021. This is an important meeting as it is the first for 2020, which was announced by the wise leadership as the preparation year for the next fifty years "2020: towards the next 50". The meeting participants were keen on presenting and discussing ideas that would draw a road map for developing smart services in a way that suits the aspirations of our country, our leadership and our people. We have accomplished a lot in the past fifty years, and today we are at the starting lines of a new race that will last for the next fifty years, a race of which we would only be satisfied in achieving the first place. The team meeting today aims to provide future visions to develop our smart services, in order to reach the ultimate goal of these services, which is the happiness of our community members." H.E. Al Housani added: "During this meeting, we addressed the most important achievements of the team during the past year, and highlighted the level of achievement for each of the standard initiatives that we launched as well as the requirements of the next phase. We focused in the meeting through an innovation and future foresight session on exploring solutions and ideas that serve our aspirations in the smart services sector, in the areas of open data, smart services, e-participation, and the requirements of the United Nations." The meeting also discussed the challenges that will be posed in the Hackathon 2020 in support of Expo 2020 in the near term and the coming fifty in the long term. During the innovation and future foresight session, the participants explored innovative solutions drawing on creative ways of thinking for a number of challenges related to digital government, such as improving mechanisms for providing digital services to ensure raising people's happiness and wellbeing, providing open data systems on the portals of the entities and the official UAE portal, activating innovation and future foresight mechanisms, developing digital government services, driving change in government entities to support digital transformation, and ensuring the involvement of all segments of society in decision-making through digital participation. The OSI Executive Team includes representatives of 11 federal and local government entities, and its priorities are to achieve a sustainable environment, integrated infrastructure and the goals set at the global level. The team works according to the most important global trends in the e-government survey, which is bridging the digital divide, open data, promoting usage, multi-channel services, interconnected government, and e- participation.

(January 13, 2020) tra.gov.ae

REGULATORY ACTIVITIES BEYOND THE SAMENA REGION

Australia

Analysis by Australia's competition watchdog found while mobile data allowances increased 65 per cent in the year to end-June 2019, the average price for mobile services fell 6.6 per cent. The annual decrease was slightly below the average 7.5 per cent reduction in prices over the past five years, the Australian Competition & Consumer Commission (ACCC) revealed in a regular market report. Over the same period, fixed broadband prices fell 2.5 per cent each year. In the year to end-June 2019, prepaid mobile prices dropped 7.3 per cent year-on-year and post-paid by 6.5 per cent. The largest increases in data allowance were recorded in tariffs in the AUD60 ($41.19) to AUD70 range. Within this, average post-paid allocations increased from 23GB to 43GB, with prepaid nearly doubling from 29GB to 57GB. While mobile prices continued to fall, the ACCC

pointed to a reduction in the number of affordable entry-level plans available on the market, which it said are being withdrawn in favor of higher-priced plans with more inclusions. ACCC chair Rod Sims, said: "While competition and investment are giving consumers better value in terms of higher quality services for their money, consumers who do not want bells and whistles are struggling to find cheap, entry-level, fixed broadband and voice products." Strong demand for streaming services fuelled a 47 per cent jump in data downloads, with fixed broadband accounting for 88 per cent of the total. The proportion of Australians relying solely on mobile for broadband dropped from 23 per cent in 2014 to 16 per cent in 2019, ACCC noted, citing data from the Australian Communications and Media Authority. (January 21, 2020) mobileworldlive.com

Belgium

The Competition College of the Belgian Competition Authority (BCA) has suspended implementation of the planned mobile network sharing joint venture between Proximus and Orange Belgium until 16 March following a complaint from rival mobile network operator (MNO) Telenet. In a press release issued, the competition authority announced it was imposing an interim injunction on the transfer of staff to the new joint venture, although the two companies are free to proceed with preparations for the alliance, including the purchase of network equipment. The BCA noted the delay will give the Belgian Institute for Postal Services and Telecommunications (BIPT) more time to consider the deal, first announced in July 2019. Telenet, which argues the tie-up will limit competition and hamper innovation, welcomed the announcement, describing it as 'a step in the right direction'. Orange and Proximus, meanwhile, stressed they had already taken steps to allay the regulator's concerns and claimed the

agreement will have 'positive effects for customers and Belgian society as a whole'. (January 13, 2020) commsupdate.com

Telecoms regulator the Belgian Institute for Postal Services and Telecommunications (BIPT) has announced a public consultation on a range of issues regarding mobile spectrum. Stakeholders are invited to comment on the legislative proposals for reorganizing spectrum in the 3.4GHz-3.6GHz frequency band to enable its use for 5G, the potential use of the 3.8GHz-4.2GHz frequency band by private 4G and 5G networks, as well as the extension of 2G and 3G authorizations beyond the current expiry date of 15 March 2021, due to delays in finalizing an auction. The consultation will also examine plans for operators to pay a license fee for use of the 3.4GHz-3.8GHz frequency band, similar to that applied to the 800MHz, 900MHz, 1800MHz, 2GHz and 2.6GHz bands. Stakeholders have until 29 January 2020 to submit their views. (January 2, 2020) commsupdate.com

Brazil

An auction of 5G spectrum in Brazil could be delayed by 12 months as regulator Anatel remains embroiled in a dispute over the rules of the process, Financial Times (FT) reported. The auction was scheduled to be held in March, but this was pushed to at least the end of the year: analysts told FT a Q1 2021 date was more likely. An official timeline could be revealed in February when Anatel's board meets, but a public consultation and judicial review still need to be held. A representative for Anatel said the consultations had been postponed

and there was no timetable for the auction to be held at this stage. The delay represents a setback for major equipment vendors, which are expected to bid for lucrative contracts to supply 5G equipment and infrastructure to operators in the country. In mid-2019, Nokia's Latin America CTO Wilson Cardoso told Mobile World Live Brazil would be home to the world's biggest auction of 5G suitable frequencies. Ericsson also had high hopes for the country, announcing in November 2019 it would invest BRL1 billion ($244

million) to manufacture 5G kit. It was among the first to express its disappointment about the delay, with Tiago Machado, director of government relations for Ericsson LatAm South, telling FT politicians and regulators must "take proper measures to make sure this goes forward in a timely manner". The delay could have one positive, by providing Brazil's government more time to decide if it will allow Huawei to participate in 5G network builds. Brazil is one of many countries facing from pressure from the US to ban the Chinese vendor on security grounds. (January 13, 2020) mobileworldlive.com

Brazil's National Telecommunications Agency (Anatel) has reviewed the quality requirements for cable television companies, reports Veja. According to a resolution published in the Official Gazette, "quality goals are established from the consumer's point of view and must be met equally by all providers of pay-TV services". The main new development is that every operator should have an Ombudsman to receive customer complaints, with a ten-day deadline to deal with them. Once that deadline has expired, if there is disagreement with the measures adopted, consumers can take their demands directly to Anatel. Unlike before, customers now have predictable situations in which they can exercise unilateral breach of contract. (December 29, 2019) telecompaper.com

Chile

Chile's telecoms watchdog has begun public consultation on plans to auction spectrum for 5G services, inviting 'all members of the digital ecosystem' to participate in the process, which will run until 14 February 2020. The Department of Telecommunications (Subsecretaria de Telecomunicaciones, Subtel) has proposed selling off spectrum in four bands via separate and independent processes, although each concession will be valid for 30 years and carry technological restrictions. The frequencies available are as follows: one 2×10MHz block of 700MHz spectrum (703MHz-713MHz/758MHz-768MHz); 2×15MHz in the 2100MHz band (1755MHz-1770MHz/2155MHz-2170MHz); 15 10MHz blocks in the 3500MHz band (3300MHz-3400MHz, and 3600MHz-3650MHz); and two tranches of 400MHz in the 28GHz range. For the two FDD licenses, Subtel has stipulated that the winning bidder must use the spectrum for the rollout of LTE-A Pro or 5G services. Concessions in the two higher bands, meanwhile, must be used for 5G. The regulator also set out coverage requirements for the licenses, with the 700MHz licensee's footprint to cover 200 square kilometers of each commune in the five most populous regions (Santiago Metropolitan, Valparaiso, Biobio, Maule and Araucania) and 100 square kilometers of each commune in the other eleven regions. Holders of licenses in the other three bands, however, are expected to cover a portion of each commune nationwide as follows: 2100MHz, 100 square kilometers; 3500MHz, 40 square kilometers; and 28GHz, one square kilometer. (January 15, 2020) commsupdate.com

China

The Chinese government has awarded a 5G trial license to state-owned cable TV operator China Broadcasting Network with the aim of accelerating the nationwide deployment of 5G in the country. Through this license, the broadcaster will be allowed to run trials in the 4.9 GHz frequency range in 16 cities including Beijing, the Ministry of Industry and Information Technology (MIIT) said. In June, China Broadcasting Network had obtained a license for the provision of commercial 5G services. At that time, the government also granted licenses to China Mobile, China Telecom and China Unicom. The new test frequency license means that the state-owned broadcaster has officially obtained the right to use 5G frequencies in relevant regions across China. At the end of last year, the MIIT issued licenses for 5G trials in a number of cities across China. Commercial rollout of 5G in China was initially expected to occur during 2020. However, the Chinese government decided to accelerate 5G deployment will trigger investment in the Chinese market. All the 300 prefecture-level cities in China are expected to be covered by a 5G network by the end of 2020, according to a recent statement by MIIT. Recent data from MIIT showed that Chinese state carriers have already deployed a total of 126,000 5G base stations across the country. Chinese telcos China Mobile, China Telecom and China Unicom had launched commercial 5G services in November 2019. The service was initially available in large cities including Beijing, Shanghai, Shenzhen, Hangzhou, Nanjing and Tianjin. According to previous reports, the three operators were expecting to operate nearly 130,000 5G base stations by the end of 2019. China Mobile announced plans to install 50,000 5G sites by end-2019, while China Unicom and China Telecom each target about 40,000, according to press reports. According to the China Academy of Information and Communications Technology, 5G technology is expected to create more than 8 million jobs in China by 2030. It is forecasted that 28% of China's mobile connections will be running on 5G networks by 2025, accounting for about one-third of all 5G connections globally, according to a previous report by the GSMA. (January 7, 2020) rcrwireless.com

Colombia

Partners, the bidding vehicle used by Novator Partners – the Icelandic-owned, London-based owner of Chilean upstart operator WOM – has asked Colombia's Ministry of Information Technologies and Communications (MinTIC) to retract one of its offers in last month's spectrum auction, after accidentally entering a bid ten times higher than the going rate. As per MinTIC bidding documents, the newcomer mistakenly entered a bid of COP1.748 trillion (USD534.2 million) for Block 2 in the 2500MHz band, well ahead of its bids for Block 5 (COP293.2 billion) and Block 6 (COP173.5 billion). Partners seeks to have the higher bid removed from the auction proceedings, but the other 2500MHz blocks are unaffected by the request. A statement issued by the MinTIC on 3 January confirmed: 'The operator indicates that there is an inconsistency in the value offered in one of the blocks and incurred in error … the MinTIC, in the light of the rules established in the auction, and the regulations in force, will study the application and will decide on it in the coming weeks.'
(January 6, 2020) commsupdate.com

Colombia's Ministry of Information Technologies and Communications (Ministerio de Tecnologias de la Informacion y las Comunicaciones, MinTIC) has announced that December's multi-band spectrum auction generated a total of COP5 billion (USD1.5 billion). The watchdog summarizes the results as follows:

- Claro acquired 20MHz in the 700MHz band and 30MHz in the 2500MHz band;
- Tigo acquired 40MHz in the 700MHz band, but was unable to bid on 2500MHz frequencies due to spectrum caps;
- Partners (a bidding vehicle for Novator Partners, the Icelandic-owned, London-based owner of Chilean upstart operator WOM) acquired 20MHz in the 700MHz band and 30MHz in the 2500MHz band; and
- Telefonica Colombia, which had registered to participate, did not win any spectrum.

MinTIC notes that a 2×2.5MHz 1900MHz block went unsold as did a 10MHz block of 700MHz spectrum. The 700MHz spectrum licenses are understood to include obligations to bring 4G connectivity to 3,658 rural locations across 32 departments of the country, including the San Andres archipelago; all rural 4G networks must be operational in less than five years.
(January 2, 2020) commsupdate.com

Estonia

The distribution of 5G spectrum in Estonia is still on hold following the latest legal challenge against the terms of the planned auction. Last month the Circuit Court in Tallinn upheld a decision by the Ministry of Economic Affairs and Communications (MKM) to offer three 5G licenses in the 3400MHz-3800MHz band. The Ministry was forced to postpone the auction in March 2019 when fixed-wireless and IoT operator Levikom challenged the terms, saying that offering just three concessions would hamper competition by favoring the trio of incumbent cellcos. Levikom has now appealed last month's court ruling, taking the matter to the country's Supreme Court. Levikom wants a mix of national and regional licenses to be made available, allowing smaller players like itself to enter the 5G market. The matter has been confused by reports that Levikom is behind with its tax payments, meaning it could well have been barred from participating in the 5G auction process anyway. Eesti Rahvusringhaaling (ERR) cites Ministry spokesperson Laura Laaster as saying: 'The court dispute has no doubt slowed down the process of issuing frequency permits and consequently the development of 5G networks. At the same time, we cannot say Estonia has fallen far behind other countries.'
(January 23, 2020) commsupdate.com

France

French communications regulator Arcep officially opened applications for the sale of 5G spectrum licenses, Arcep said in a statement. Interested operators will have until February 25 to submit their applications. This announcement follows the confirmation of pricing and terms released by Arcep in mid-December. Arcep also confirmed that it plans to conduct the allocation procedure and award the frequency licenses to the winning candidates in the first half of 2020. Under the terms of the spectrum auction, France's four existing operators will be offered 50 megahertz of spectrum in the 3.4-3.8 GHz bands at a fixed price of €350 million ($389 million) for each block. Further blocks of 10 megahertz will then be sold with a reserve price for each lot of €70 million. Each operator can acquire a minimum of 40 megahertz and maximum of 100 megahertz in the process. Authorities expect to raise at least €2.2 billion with the sale of 5G licenses. The regulator had also said that the use of the 3.4-3.8 GHz band will be complemented by other bands, each of which will help reach the full potential of 5G. These include the 700 MHz band, which was already allocated to operators in France in 2015, and the 26 GHz band, which will be allocated at a later date. The country's four operators Orange, SFR, Iliad and Bouygues are all expected to take part in the upcoming 5G auction.

Arcep's specifications stipulate that each operator must launch 5G services in at least two cities before the end of 2020. Each carrier should deploy 3,000 sites by 2022, 8,000 sites in 2024 and 10,500 sites by 2025. Eventually, all of the cell sites must provide 5G service using frequencies in the 3.4-3.8 GHz band or other bands, according to the regulator. Arcep also highlighted that it is proposing that 25% of 3.4-3.8 GHz band sites in the last two stages must be located in sparsely populated areas, targeting economic activity, notably manufacturing, excluding major metropolitan areas. By 2022, at least 75% of cell sites must be capable of providing speeds of at least 240 Mbps at each site. Arcep's conditions also stipulate the obligation for carrier to deploy 5G to provide coverage in roadways across France. Arcep has also provided for commitments that seek to improve indoor coverage for business and commercial purposes, and to facilitate coverage by multiple operators. Commitments also concern the supply of dedicated fixed access products on mobile networks.

(January 4, 2020) rcrwireless.com

Germany

Germany's Federal Network Agency (FNA, known locally as the Bundesnetzagentur or BNetzA) is reviewing reports submitted by mobile network operators to determine whether they met the coverage requirements of the 2015 multi-band spectrum auction. These include an obligation to provide mobile data speeds of at least 50Mbps to 98% of households nationwide and 97% of households in each federal state from 1 January 2020, as well as fully supplying the main traffic routes. According to their own information, Telekom Deutschland and Vodafone Germany claim they fulfilled the household coverage requirements, while Telefonica Deutschland says it was unable to meet the obligations but expects to achieve the required levels by the end of the year. None of the trio were able to fulfil the requirement to fully serve all major traffic routes, with the delays attributed partly to a lack of building permits, monument and environmental protection, and nature conservation. The FNA is currently reviewing the information provided by the operators and will conduct its own measurements in each federal state. The regulator will then decide on whether each company has fulfilled the coverage requirements of their mobile spectrum licenses. (January 14, 2020) commsupdate.com

India

India will no longer be behind the technology curve following the timely launch of fifth-generation or 5G networks, the Telecom Regulatory Authority of India (TRAI) Chairman Ram Sewak Sharma said. "Now, we have come to a stage where technology develops in India first. With 5G, we will no longer remain behind the technology curve," Sharma said at the Telecom Summit 2020 organized by the PHD Chamber of Commerce & Industry and the Telecom Equipment Manufacturers Association (TEMA). But he pointed to challenges like funds scarcity and low fiber backhaul for the deployment of the next gen technology in India. "There are less than a third of mobile towers connected to fiber backhaul when compared to China that has more than 80% connected," Sharma said. He added that the telecom sector should be treated as 'strategic' to serve citizens and that issues such as the Right-of-Way (RoW) should be set right. "Telecom sector should not be considered as a money-making machine for local bodies," Sharma said. He said some of the key features of next generation technology include low-latency communications, huge throughput and massive machine-to-machine communication. (January 22, 2020) economictimes.indiatimes.com

India's Supreme Court has upheld a December 2018 ruling from the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) instructing the Department of Telecommunications (DoT) to refund INR1.04 billion (USD14.4 million) to bankrupt cellco Reliance Communications (RCOM). The apex court rejected an appeal from the DoT, directing the ministry to repay the amount to RCOM. The original ruling was issued after DoT encashed bank guarantees of INR9.08 billion against spectrum dues of INR7.74 billion, with the ministry opting to retain the excess for the cellco's other liabilities. In its December 2018 decision, however, the TDSAT ruled that difference could not be used for other dues, noting that, although the DoT had adjusted INR303 million, 'the remaining amount of INR1.04 billion … should be returned to the petitioner without prejudice to rights of either party for any other charges which the petitioner may be found liable to pay.' RCOM is currently going through insolvency proceedings, with its creditors this week reportedly assessing bids for the operator's various assets. (January 7, 2020) The Economic Times

The Indian government gave the green light for all network equipment suppliers, including Huawei, to participate in upcoming 5G trials, signaling the Chinese vendor could take part in deploying the next-generation technology in the country. The Telecoms Minister Ravi Shankar Prasad said 5G trials will be done with all operators and all vendors are invited. In a statement, Huawei acknowledged: "We thank the Indian government for its continued faith in Huawei. We firmly believe that only technology innovations and

high-quality networks will be the key to rejuvenating the Indian telecoms industry." After continued US pressure on India to ban the Chinese vendor's kit, Huawei in October offered to adhere to strict security standards in a bid to persuade Indian authorities it does not pose a threat to 5G networks, with a specific pledge not to install backdoors in equipment sold to operators in the country. The Indian government in June set up a committee to review Huawei's network security and previously expressed reluctance to allow the vendor to deploy its 5G gear, which it fears could contain back doors which could allow the Chinese government to spy on users. The country plans to hold 5G spectrum auctions by the end of Q1. (January 2, 2020) The Economic Times

Italy

Italy's Ministry of Economic Development (Ministero dello Sviluppo Economico, MiSE) has allocated more than EUR4 million (USD4.5 million) funding for six projects to develop emerging 5G applications. The schemes are being run by three universities plus three public bodies, in cooperation with telcos such as Wind Tre and Telecom Italia (TIM). The projects cover topics such as IoT, smart cities, artificial intelligence (AI) and blockchain.

(January 14, 2020) commsupdate.com

Japan

The Ministry of Internal Affairs and Communications (MIC) plans to establish a government-led research group to discuss the next generation of mobile technologies after 5G, local press is reported as saying. The Nikkei suggests that Japan's plans for 'post-5G' (i.e. 6G) technology envisage communications rates that are ten time faster than 5G by 2030, while noting that the likes of China, Finland and South Korea have also begun R&D work and investment in this respect. In Japan, the MIC will reportedly work with officials from NTT DOCOMO and Toshiba to formulate wide-ranging strategies on 'sixth-generation' performance goals and policy support by June 2020, promoting the development of 6G using funds from the state budget. 'The research will center on network speeds that can instantly transfer large amounts of data instantly. This technology is suitable for transmitting large amounts of data. Unused high-frequency radio waves will also be used for communication' the report read.

(January 20, 2020) commsupdate.com

Malaysia

A final report on the allocation of spectrum, including frequencies suitable for 5G, has been published by the Malaysian Communications and Multimedia Commission (MCMC), following a public inquiry that it published last September. In a press release, the MCMC noted that the position taken in the final report 'reflects both MCMC's deliberation of the responses to the [public inquiry], and an assessment of current developments globally in relation to 5G deployment'. As per the report, the MCMC confirmed it has identified the 700MHz, 3.5GHz and 26GHz-28GHz bands as the pioneer spectrum bands for the rollout of 5G in Malaysia. Of particular note, it said the 700MHz and 3.5GHz bands are being considered for allocation to a single entity comprising a consortium formed by multiple licensees, instead of individual licensees, with the MCMC to undertake a tender process for this purpose. According to the regulator, such an approach is intended to lower capital expenditures by minimizing costs and preventing the duplication of infrastructure. As this is a new approach, the MCMC has said it will only make available 2×30MHz in the 700MHz band and 100MHz in the 3.5GHz band, with the remaining spectrum in these bands to be considered for assignment 'at a later stage'.

Meanwhile, the assignment of the 26GHz-28GHz bands will be conducted via two methods; frequencies in the 24.9GHz-26.5GHz range will reportedly be assigned through a tender process (beauty contest) to licensees on a nationwide basis; and spectrum between 26.5GHz and 28.1GHz will be assigned on a first-come first-served basis and will be open to any party (including non-licensees) for the purpose of deploying localized and/or private networks. According to the MCMC, the assignments for spectrum in the 26GHz-28GHz bands will be made by way of apparatus assignment (AA), with it suggesting that the appropriate spectrum fee through AA 'is more economical, and will encourage network deployment by the service provider'. Once the assignment processes are completed, the MCMC has said it expects commercial 5G deployments in Malaysia to begin by the third quarter of 2020. Meanwhile, the regulator also confirmed that existing spectrum allocations for 4G deployments will be maintained; specifically it said that current 2300MHz and 2600MHz spectrum allocations will remain valid until December 2021, with a further review of these frequencies to be undertaken that year.

(January 2, 2020) commsupdate.com

Mauritania

The Regulatory Authority (Autorite de Regulation, ARE) has handed out fines to the country's three cellular operators for failure to maintain adequate quality of service (QoS) on their respective networks. Mauritel, a subsidiary of Maroc Telecom, was hardest hit, with a fine of MRU86.35 million (USD2.26 million). Meanwhile, Mattel has been fined MRU23.92 million and Chinguitel must pay MRU33.45 million. The penalties relate to QoS tests that were carried out between 16 November and 12 December 2019. (January 3, 2020) commsupdate.com

Mexico

Over a decade after its previous – subsequently abandoned – attempt to register pre-paid SIM cards in Mexico, the government is said to be considering a fresh registration initiative. As per local press reports, the new attempt is being spearheaded by the Secretariat of Public Safety and Protection (Secretaria de Seguridad y Proteccion Ciudadana, SSPC), which cites the growing threat of extortion as a pressing concern. A requirement for Mexican pre-paid mobile phone users to register their details with network operators became law in February 2009, coming into effect from April that year, giving service providers one year (until April 2010) to register their existing customer base and collect proof of identity for all new sales. SIM card registration was repealed in 2012, however, after a policy assessment found that it had not helped the prevention, investigation and prosecution of associated crimes. (January 16, 2020) commsupdate.com

Recent press reports suggesting Telefonica is poised to return its Mexican cellular frequencies have been confirmed by Alejandro Navarrete, Head of the Radio Spectrum Unit at the Federal Telecommunications Institute (Instituto Federal de Telecomunicaciones, IFT). In an interview with Aristegui Noticias, Mr. Navarrete explained that – as part of the Spanish group's operational overhaul of its Hispanoamerica businesses – Telefonica Moviles Mexico (Movistar) has opted to return its spectrum in the 800MHz and 1900MHz bands. This process commenced on 31 December 2019 and will conclude on 30 June 2022. TeleGeography notes that in November 2019 Movistar signed a 'last mile wireless capacity access agreement' with AT&T Mexico, securing access to its 3G and 4G networks. The migration of Movistar's traffic to the AT&T network commenced immediately and is being implemented gradually. (January 10, 2020) commsupdate.com

New Zealand

New Zealand announced the reserve price for a 5G spectrum auction, as it prepares to release the short-term management rights of airwaves in the 3.5GHz band. In a statement, Radio Spectrum Management (RSM), a business unit of the Ministry of Business, Innovation and Employment responsible for allocating and licensing spectrum, said the reserve price will be set at NZD250,000 ($166,147) per 10MHz lot, with a total of 16 lots available. There is a minimum bid of two lots per registered bidder, and interested parties are required to register and pay a deposit of NZD500,000. In December 2019, New Zealand's government agreed to free up additional 5G spectrum, heeding operators' calls for the early release of 160MHz in the 3.5GHz band.

Spectrum rights of 3.5GHz airwaves will be allocated for a term beginning in mid-2020 until 31 October 2022. The long-term rights will start in November 2022 following another auction. A simplified combinatorial clock auction process will be used comprising up to three phases: clock; supplementary; and placement. RSM set an initial acquisition limit at four lots (40MHz) per registered bidder, but noted this may be raised in the supplementary phase if lots go unsold in the clock phase. Successful bidders will be required to return existing management rights they hold elsewhere in the 3.5GHz band. A discount from the purchase price will be applied if spectrum is returned, based on the price per MHz of the winning bid. (January 13, 2020) mobileworldlive.com

Niger

The Regulatory Authority for Electronic Communications and Post (Autorite de Regulation des Communications Electroniques et de la Poste, ARCEP) has fined four mobile operators a combined XOF2.57 billion (USD4.4 million) for failing to meet quality of service (QoS) standards. Niger Inter reports that Airtel Niger has been fined XOF1.05 billion (equating to 1.25% of its annual turnover for 2018) and Niger Telecoms must pay XOF606.2 million (1.5% of its 2018 revenue). Orange and Moov Niger were each handed a penalty of 1% of their 2018 annual turnover, equating to XOF524.3 million and XOF391.9 million, respectively.

(January 2, 2020) commsupdate.com

Nigeria

The Nigerian Communication Commission, NCC, has disclosed that it witnessed impressive growth in the effective regulation of telecommunication under the leadership of its Executive Vice Chairman, Professor Umar Danbatta. A statement signed and sent to DAILY POST NCC said "telecoms contribution to Nigeria's Gross Domestic Product (GDP) increased from 8.50 percent in August 2015 to 11.39 percent as at October, 2019." It explained that the feat was achieved due to effective regulatory environment created by the commission's helmsman, Umar Dambatta, NCC also revealed that telecommunications' from August 2015 till date recorded high growth statistics. According to data released by the commission, "Active mobile voice subscribers increased from 151,018,624 to 2015 to 180,386,316 during the same period while teledensity increased to 94.50 percent following its rebasing in early 2019. "Internet subscribers increased from 90 million in 2015 to 123.5 million by October, 2019 while broadband penetration jumped from 8 percent to its current 37.87 percent, indicating a total of 72,289,389 Nigerian access data services on 3G and 4G networks. "Also, the number of subscriptions to Mobile Number Portability (MNP) service increased from 385, 617 in August 2015 to 1, 206,874 by October, 2019. "Similarly, the total number of telecoms subscribers that have subscribed either partially or fully to the Do-Not-Disturb (DND) service introduced by the Commission – to curb cases of unsolicited text messages – increased from level zero to 22,356, 919 currently." The NCC in its press statement attributable the feat to an increased public enlightenment by the Commission's head office and its zonal offices across geo-political zones, especially on the availability and usage of Mobile Number Portability.

(January 18, 2020) dailypost.ng

A long-running spat between MTN Group and Nigerian authorities cooled as a demand for $2 billion in back taxes and a related legal action were withdrawn, with the matter referred to the country's revenue and customs departments for resolution. In a statement, MTN said Nigeria's attorney general removed an order made in late 2018 demanding payment of dues related to historical equipment imports and supplier payments. The operator had vowed to fight the demand in court with the case due to begin on 30 January, having already been postponed a number of times. Legal action has now been called-off completely. Despite the climbdown by the attorney general, the matter is not completely closed. The case is being referred to the country's inland revenue and customs departments, which will both engage with MTN Nigeria to find a solution. MTN said it was committed to "maintaining cordial relationships with all regulatory authorities in Nigeria". The operator's CEO Rob Shuter (pictured) added the attorney general's decision "paves the way to an orderly and amicable resolution of this matter". The news comes a year after the company settled a separate dispute with Nigerian authorities over an $8.1 billion fine levied on claims the operator improperly moved funds out of the country. MTN eventually paid $53 million and denied allegations throughout the case. After settling the $8.1 billion dispute, MTN's relations with Nigerian regulators significantly thawed. Its local division has since listed on the country's stock exchange and secured a mobile money agent licence through one of its subsidiaries.

(January 13, 2020) commsupdate.com

Norway

The National Communications Authority (Nasjonal kommunikasjonsmyndighet, Nkom) has published details of changes to the obligations applied to Telenor Norge, in light of the telco's plans to replace its copper network with new technology by the end of 2022. In a press release regarding the matter, the regulator noted that previously, in December 2018, it had determined Telenor as holding significant market power (SMP) in Market 3a, wholesale local access provided at a fixed location, and Market 3b, wholesale central access provided at a fixed location for mass-market products. Based on competition problems it had identified, as part of the determination the Nkom ruled that Telenor would be subject to obligations related to access and pricing. Now, as a result of Telenor's plans for its infrastructure, the watchdog has said this development will impact the competition problems underlying the telco's existing obligations in the broadband market. As such, it has sought to clarify Telenor's obligations, arguing that there is a need to change the content and

scope of some of the obligations. Specifically, the Nkom has said that fiber accesses completed by Telenor after 1 February 2019 are to be considered part of a 'systematically expanded access network', being that such connections are being rolled out as a replacement for copper connectivity. Fiber-based infrastructure deployed after that date will, therefore, be regulated as per the Nkom's December 2018 decision related to markets 3a and 3b, and as such Telenor will be required to offer wholesale access to it. In addition, Telenor will now be required to report on the reclassification of individual fiber accesses (i.e. those fiber connections rolled out pre-February 2019) as the telco continues to replace its copper infrastructure. To that end, the regulator has said that individual fiber accesses should be reclassified as part of the operator's systematically expanded access network when Telenor undertakes a new fiber development in the same area as the existing fiber lines. In addition, the telco will be required to submit reports regarding these reclassifications

biannually (in March and September), with the first due to be submitted on 1 March 2020. According to the Nkom, it is still considering whether further changes to Telenor's SMP obligations are needed, and it has said it aims to determine whether this is the case 'in the near future'. Comments on the initial changes to the obligations are, meanwhile, being accepted until a 27 January deadline. (January 8, 2020) commsupdate.com

Philippines

The Philippines' mobile operators Globe Telecom, PLDT's Smart Communications and New Major Player (NMP) DITO Telecommunity have pledged to support the rollout of mobile number portability (MNP) this year, albeit grudgingly. The Manila Times cites Senator Sherwin Gatchalian – the lead author of the Mobile Number Portability Act (MNPA, a.k.a. the Lifetime Cellphone Number Act) – as saying that he has held discussions with the operators and technology service provider Syniverse on how to expedite the implementation of MNP services in the Philippines, allowing users to switch networks or change subscriptions without losing their current mobile number. 'They should implement the Mobile Number Portability Act, even by phases as long as it will be done within the first six months this year,' he said, suggesting that the cellcos phase in MNP by first offering it to post-paid users and then pre-paid in 2021. With the operators arguing that the integration, interoperability and other technical issues might delay the process until 2H21, Gatchalian has said that any further stalling in putting MNP in place is a 'disservice to Filipino consumers who are fed up with the telcos' poor and expensive services'. Gatchalian reaffirmed that, as per the provisions of the Lifetime Cellphone Number Act, MNP should be available within six months from the promulgation of the implementing rules and regulations (IRR). The law – which also removes interconnection fees charged to subscribers for calling or texting across different networks – was signed in February 2019, while the IRR was issued on 11 June 2019 and took effect on 2 July 2019. 'We will closely monitor and ensure that the MNPA will be implemented immediately. Within the year, that is their commitment and that is what we will focus on,' Gatchalian added. (January 21, 2020) commsupdate.com

Poland

The proposed takeover of Polish cable operator Multimedia Polska by larger rival Vectra has been cleared by the country's Office of Competition and Consumer Protection (Urzad Ochrony Konkurencji i Konsumentow, UOKiK). Under conditions imposed on the deal, Vectra will have to sell networks in eight cities and offer customers in a further 13 markets the option of changing provider without costs. The takeover deal, which involves Poland's second and third largest cablecos, was first announced in August 2018. Multimedia had previously been a takeover target of cable market leader UPC, but that deal collapsed due to competition concerns. (January 20, 2020) commsupdate.com

Portugal

The National Communications Authority (Autoridade Nacional de Comunicacoes, ANACOM) issued its final approval regarding the frequencies it intends to distribute for 5G use. As a result, the regulator will auction spectrum in the following bands: 700MHz, 900MHz, 1800MHz, 2100MHz, 2600MHz and 3.6GHz. ANACOM notes that pre-existing regional stipulations have been removed from the 3.6GHz band, and a total of 400MHz in that range will be divided into 10MHz nationwide blocks. The spectrum sale is expected to take place before June 2020. In a related development, ANACOM has finalized the 'reconfiguration and relocation' of the 3.4GHz-3.8GHz spectrum currently held by small cell wholesale provider Dense Air Portugal. The spectrum that the UK-owned company holds in Lisbon will be reduced from 168MHz to 100MHz and Dense Air will be relocated to the lower end of the band to allow for increased access for other companies. Dense Air's spectrum will expire on 5 August 2025. (January 2, 2020) commsupdate.com

Romania

The President Klaus Iohannis has backed the government's decision to postpone a 5G spectrum auction originally planned for late 2019. Local news agency Agerpres reports that President Iohannis said during an informal press briefing on 20 December that it was not appropriate to stage an auction at the present time, as China's Huawei is the only equipment supplier capable of implementing the network at present. 'What tender for 5G? Huawei or Huawei?' noted President Iohannis, adding: 'I am not willing to make the wrong decision for the whole society.' Romania's National Authority for Management and Regulation in

Communications (ANCOM) had previously indicated that it expected 5G licenses in the 700MHz, 800MHz, 1500MHz, 2600MHz and 3400MHz-3800MHz frequency bands to be awarded by the end of 2019. However, this was later pushed back to 2020 in order to allow the new government to set spectrum license prices as part of the 2020 budget, as well as implement a security memorandum signed between the US and Romania, the terms of which have not been disclosed. The Romanian authorities are also awaiting the release of a new set of security specifications being formulated by the European Commission.

(January 3, 2020) commsupdate.com

The National Authority for Management and Regulation in Communications (ANCOM) has proposed extending the validity of four existing licenses in the 2100MHz band until 31 December 2031. The regulator has proposed a fee equivalent to EUR30 million (USD33.6 million) to extend the licenses held by Orange and Vodafone, which expire in March 2020, whereas RCS&RDS and Telekom Romania Mobile Communications would pay EUR25 million to extend their licenses beyond January 2022. The consultation will close on 17 January 2020. Orange, Vodafone and Telekom Romania currently use the 2100MHz band for the provision of 3G networks and services, while RCS&RDS uses it for both 3G and 4G. (January 2, 2020) commsupdate.com

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Singapore

The telecoms regulator the Infocomm Media Development Authority (IMDA) has pushed back the deadline for 5G license bids to give the city-state's mobile network operators (MNOs) more time to submit their proposals. Citing MNOs' requests for 'more time', the IMDA announced that it is extending the initial Call for Proposal deadline that opened on 17 October 2019 and was originally set to close on 21 January 2020. With the authorities keen to auction frequencies to support four fifth-generation networks, the extension is not expected to affect the timeline for Singapore's rollout. The IMDA has said that the rollout of new networks can begin this year, but notes that nationwide coverage may take much longer and be initially limited to only two networks – due to the current scarcity of suitable 5G airwaves for island-wide coverage. Wider coverage will start being provided in 2022, The Business Times notes. All four of Singapore's MNOs – Singtel, StarHub, M1 Limited and TPG (Singapore) – have welcomed the regulator's decision. (January 10, 2020) commsupdate.com

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South Korea

The merger between SK Broadband, a subsidiary of Korea's top mobile carrier, SK Telecom, and No. 2 cable TV operator t-broad received a green light as the country's ICT Ministry confirmed its original ruling of granting conditional approval to the combination. The Ministry of Science and ICT upheld its decision from December, which gave approval to the deal on the condition that the merged company comply with fair business practices and keep employment stable. The Ministry's latest decision comes one day after the Korea Communications Commission gave the merger deal its conditional approval regarding broadcasting laws. It wraps up an eight-month review of the merger deal requested by SK Telecom and Taekwang Industrial, the parent firm of t-broad, in May 2019. Under the deal, SK Telecom's shares in the merged company will stand at a commanding 74.4 percent, with Taekwang serving as the second-largest shareholder at 16.8 percent. SK Telecom said the merged entity will be officially established in April. It is estimated the merged entity, to be controlled by SK Telecom, will take a 23.9 percent share of the pay TV market. Industry insiders expected that local telecom firms will try to acquire other major cable TV operators - D'Live, Central Multi Broadcasting and Hyundai HCN - to bulk themselves up in the pay TV market. (January 21, 2020) koreajoongangdaily.joins.com

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Sweden

The Swedish Post and Telecom Agency (Post & Telestyrelsen, PTS) has presented a plan for the distribution of subsidies to develop fixed broadband infrastructure to meet EU digital agenda goals. The regulator says EUR150 million (USD166 million) will be made available in 2020 to support projects to bring high speed access to rural communities in four regions. Over the next three years it plans to distribute a total of EUR650 million in subsidies to cover areas where market forces will not drive commercial rollouts. The government hopes to have every household passed by gigabit-capable networks by 2025.

(January 21, 2020) commsupdate.com

Switzerland

Switzerland's Federal Office of Communications (Ofcom, also known as Bundesamt fur Kommunikation or Bakom) has implemented changes to the universal service license, tripling the minimum broadband speeds to be offered by the licensee to 10Mbps/1Mbps (downlink/uplink) from 3Mbps/300kbps. The new requirements followed a decision from the Federal Council in October 2019 and came into effect from 1 January 2020. State-owned full-service provider Swisscom currently holds the universal service license, which was issued in May 2017 and covers the period 2018-2022. Explaining its decision, Ofcom commented that citizens in rural or poorly-connected areas would benefit from the measure as 'the faster connection increases the opportunities to participate in social and economic life'. The regulator notes that the principle of technological neutrality applies to the universal service license and, as such, Swisscom can – in addition to its fixed systems – use mobile and satellite technologies, or a mix of different platforms to satisfy the terms the license. As Swisscom is already making use of this option and the expected level of efficiency of the operator, Ofcom did not grant the telco an additional transition period to implement the new obligation.

According to the regulator, demand for the minimum speed offering is expected to be in the region of around 11,000 connections. (January 16, 2020) commsupdate.com

Switzerland's Federal Supreme Court has rejected an appeal from state-owned fixed line incumbent Swisscom against a 2009 antitrust ruling related to the company's ADSL pricing policy, confirming a fine of CHF186 million (USD192 million). The fine was originally set at CHF220 million by the Competition Commission (Wettbewerbskommission, WEKO) in 2009, when it found that the prices set by Swisscom for its wholesale ADSL services from 2001 to 2007 were too high for its competitors to offer retail ADSL services profitably. In September 2015 the Federal Administrative Court rejected a subsequent appeal from Swisscom but lowered the fine to CHF186 million. Responding to the court's decision, Swisscom stated in a press release that it maintains that the sanction is unjustified. The telco adds that it had to pay the penalty back in 2015 and as such the court's most recent decision will have no impact on Swisscom's 2019 financial statements, or its outlook for 2020. (January 2, 2020) commsupdate.com

Taiwan

All five mobile operators in Taiwan spent a total of TWD138 billion ($4.6 billion) securing 5G spectrum, with the protracted sale registering as the third-priciest auction for the technology in the world, Taipei Times reported, citing figures from the regulator. Taiwan's government forecast the sale to generate about TWD44 billion. The price per 10MHz block of 3.5GHz spectrum reached TWD5.075 billion, which the National Communications Commission (NCC) said was a world record. The auction started on 10 December and ended yesterday (16 January) after 261 rounds. On offer was 270MHz in the 3.5GHz band, 2,500MHz of 28GHz airwaves and 20MHz in the 1.8GHz band. Market leader Chunghwa Telecom paid TWD45.7 billion for 90MHz in the 3.5GHz band and TWD618 million for 600MHz of 28GHz spectrum. It plans to launch 5G services in July,

the newspaper wrote. Far EasTone acquired 80MHz of 3.5GHz spectrum for TWD40.6 billion and 400MHz in the 28GHz band for TWD412 million, while Taiwan Mobile spent TWD30.4 billion on 60MHz in the 3.5GHz band and TWD206 million for 200MHz of 28GHz airwaves. Taiwan Star Telecom secured 40MHz in the 3.5GHz band for TWD19.7 billion. Asia Pacific Telecom, the smallest operator with a 7 per cent market share by subscribers, pulled out of the 3.5GHz sale after initially bidding, but paid TWD412 million for 40MHz of 28GHz spectrum. It said it would look to cooperate with other operators. The NCC introduced regulations requiring operators to share 5G spectrum with rivals. Only 1,600MHz of the 28GHz spectrum was sold. (January 17, 2020) mobileworldlive.com

Tanzania

The Tanzania Communications Regulatory Authority (TCRA) has begun blocking unregistered customers from accessing mobile services, following the conclusion of its biometric SIM registration program on 20 January. Since that date, which was extended from an earlier deadline of 31 December 2019, over 656,091 SIMs have been barred by network operators, the regulator's Director General James Kilaba told state-run Tanzania Broadcasting Corporation. He added that additional unregistered subscribers are set to be blocked in phases. According to a company press

release, mobile market leader Vodacom Tanzania has so far barred 157,000 of its unregistered customers from accessing services. The firm's Managing Director Hisham Hendi urged customers affected by the move to visit one of Vodacom's more than 35,000 service points across the country to register their lines and continue using the company's services. (January 22, 2020) commsupdate.com

The President has extended the deadline for biometric SIM card registration to 20 January 2020, reports

The Citizen. The original deadline for mobile phone customers to register their details was 31 December 2019 but has been pushed back to enable the remaining subscribers to conclude the process, following which any unregistered SIM cards will be disconnected. In a separate development, the Tanzania Communications Regulatory Authority (TCRA) has fined six operators a total of TZS5.9 billion (USD2.6 million) for failing to meet quality of service (QoS) standards in Q3 2019. The penalties have been issued to Airtel Tanzania (TZS1.6 billion), Tanzania Telecommunication Corporation (TZS1.6 billion), Viettel Tanzania (operating as Halotel, TZS900 million), Zanzibar Telecommunication (TZS850 million), Millicom Tanzania (Tigo, TZS500 million) and Vodacom (TZS450 million).

(January 2, 2020) commsupdate.com

Thailand

The telecom regulator has set up a working panel responsible for preparing the auction process of the 3400-3700-megahertz range, believed to be the most coveted spectrum for 5G adoption among mobile operators. A source at the National Broadcasting and Telecommunications Commission (NBTC) who requested anonymity said the panel is led by Korkij Danchaivichit, deputy secretary-general of the NBTC in charge of the telecom sector. The panelists were reported to have held the first meeting last week to discuss the framework of the spectrum recall. The range is being used by SET-listed satellite service provider Thaicom for its Thaicom 5 C-band satellite. The source said the NBTC plans to auction off the range as the second batch of 5G spectrum licences, following the first batch put up for auction on Feb 16. A total of 300MHz of bandwidth on the 3400-3700MHz range could be put up for auction. The NBTC will have to choose three academics to sit on its advisory team studying terms of the spectrum recall, including compensation figures, timeline of the recall process as well as the impact on Thaicom's corporate clients and satellite TV viewers, the source said. The range is the most coveted for 5G adoption by mobile operators, the source said. A total of 11 countries in Europe have launched 5G commercial services on the 3500MHz range through a variety of networks and devices provided by vendors. An executive at a major mobile operator who requested anonymity said the 3500MHz range is the key band for the global 5G development ecosystem. "It is unavoidable for operators to examine all the 5G adoption opportunities for all the ranges, particularly the 3400-3700MHz," the source said. According to the source, 300MHz of bandwidth on the range is a suitable amount, compared with only 190MHz of bandwidth on the 2600MHz range, put up for the Feb 16 auction. Of the four spectra put up for the Feb 16 auction, the 2600MHz is reported to be the most desired among operators. Several executives at the three major operators agreed if the NBTC sets a clear timeline for the 3400-3700MHz license auction, they are likely to wait and take part, rather than joining the first batch's bid on Feb 16. In a related development, Advanced Info Service yesterday picked up bid documents for the multi-band license auction at the NBTC office. It was the fifth operator to pick them, following True Move H Universal Communication, Total Access Communication, TOT and CAT Telecom. Interested bidders are allowed to pick the bid documents until Feb 3, a day before the deadline to submit bid documents.

(January 15, 2020) bangkokpost.com

Thailand has approved the merger of two state-run telecommunication companies, CAT Telecom and TOT, into the National Telecom company (NT), which will compete with private operators in the upcoming spectrum auctions, a senior government official said. The National Telecom company will help promote the government's policy in digital infrastructure and provide services to the public, government spokeswoman, Narumon Pinyosinwat told reporters, adding that the merger should be completed in six months. The Digital Economy and Society Ministry will oversee the newly formed company, she added. The merged entity will participate in the upcoming 5G spectrum auctions on the 700 megahertz (MHz), 800 Mhz, 2600 Mhz and the 26 gigahertz frequency bands on Feb. 16, held by the National Broadcasting Telecommunication Commission (NBTC), she said. The high-band spectrums allow high data speeds that support applications such as virtual and augmented reality, self-driving cars, the remote control of industrial robots, and super-fast downloads of movies in high definition. Thailand's top three mobile operators, Advanced Info Service Pcl (ADVANC.BK), True Corporation Pcl (TRUE.BK) and Total Access Communication Pcl (DTAC.BK) have picked up bidding documents from the NBTC. CAT Telecom and TOT have also picked up the bid documents. The spectrum licenses all together worth at least 160 billion baht ($5.28 billion) based on their reserve price.

(January 14, 2020) uk.reuters.com

Ukraine

The Antimonopoly Committee of Ukraine (AMCU) has given its clearance to a plan for Ukrainian mobile operators Kyivstar, Vodafone and Lifecell to redistribute 900MHz band GSM frequencies between themselves and refarm the spectrum for 2G/3G/4G networks, after it verified that the plans would not distort competition, nor be detrimental to users, nor result in other negative economic or social impact. The AMCU's decision – disclosed on the social media pages of Ukraine's Ministry of Digital Transformation – means that operators can apply for new technology-neutral 900MHz spectrum licenses, with the Ministry estimating that the expanded usage of the 900MHz band could be implemented by 'this summer', although noting that various other 'bureaucratic procedures' must be completed first. The Ministry also noted that AMCU permission was one of the requisite steps in the operators' joint action plan approved by the regulator NCCIR. Other aspects of the refarming/relicensing plans include redistribution of 800MHz frequencies for LTE (also involving CDMA operator Intertelecom).

(January 17, 2020) commsupdate.com

United Kingdom

British telecoms regulator Ofcom has opened a consultation on regulatory proposals which it says are designed to promote competition and investment in fiber infrastructure, arguing that such investment is needed to meet future demand for ultrafast broadband services. Ofcom's consultation – entitled 'Promoting competition and investment in fiber networks: Wholesale Fixed Telecoms Market Review 2021-26' – set outs detailed plans that would be implemented from April 2021. With a four-point plan at the heart of the regulator's proposals, the core elements are: improving the business case for fiber investment by setting Openreach's wholesale prices in a way that encourages competition from new networks, as well as investment by Openreach; protecting customers and driving competition by making sure people can still access affordable broadband and preventing Openreach from stifling competition; ensuring rural areas gain access to fiber connectivity by supporting investment by Openreach in these areas; and closing the copper network as full fiber is built, so that Openreach does not have the unnecessary costs of running two parallel networks. Further, the regulator has stressed it aims to protect consumers during the transition, by transferring its regulation – including price protections – from copper to fiber-based services. With this consultation scheduled to close on 1 April 2020, Ofcom has said it aims to publish its decisions in early 2021, before the current regulation expires in April that year. Meanwhile, the regulator also noted that this review does not cover the Hull area, confirming that that part of the country will be subject to a separate consultation.

(January 9, 2020) commsupdate.com

Following a Freedom of Information request by Roger Howell, Ofcom made their database of amateur radio call signs available for download. The database, released as a spreadsheet containing 141,296 rows, shows the status of UK amateur call signs as at August 12, 2019. It can be useful for people wanting to apply for a specific call sign as it shows all those calls which are not available. Ofcom clarified the meaning of their call sign status field e.g. 'Reserved' means that the callsign has been used within the past two years, although it is no longer, and is in the process of 'cooling down'. It is therefore not currently available for assignment to anyone else, but operators will be able to apply for it again after the two-year period has expired.

(January 5, 2020) southgatearc.org

United States

Federal Communications Commission Chairman Ajit Pai announced initial estimates of how many homes and businesses in each state could benefit from Phase I of the $20.4 billion Rural Digital Opportunity Fund. In total, about 6 million rural homes and businesses could be eligible for bidding in an auction slated for later this year to receive funding for high-speed broadband. This state-by-state list is for Phase I funding, which would target a total of $16 billion to census blocks with no broadband service at all meeting the Commission's minimum speed standards. The remainder of the funding would be disbursed during Phase II. As recently announced, the FCC will vote January 30 on launching the Rural Digital Opportunity Fund.

"The digital divide affects many people in many rural communities. I've said that the Rural Digital Opportunity Fund would be our boldest step yet to bridge this divide, and today we get a glimpse of the broad impact this investment in rural America would have across the country," said Chairman Pai. "Our staff's initial estimate shows that in 25 states there would be more than 100,000 locations that would be eligible for Phase I of the Fund, and the benefits would be felt from the Pacific Coast to the Great Plains, and from Appalachia to the Gulf Coast. The Rural Digital Opportunity Fund is critical to bridging the digital divide. (January 14, 2020) fcc.gov

Federal Communications Commission Chairman Ajit Pai issued the following statement after President Trump signed the Telephone Robocall Abuse Criminal

Enforcement and Deterrence (TRACED) Act into law: "I applaud Congress for working in a bipartisan manner to combat illegal robocalls and malicious caller ID spoofing. And I thank the President and Congress for the additional tools and flexibility that this law affords us. Specifically, I am glad that the agency now has a longer statute of limitations during which we can pursue scammers and I welcome the removal of a previously-required warning we had to give to unlawful robocallers before imposing tough penalties." "I want to thank Chairmen Thune and Pallone, Chairmen Wicker and Doyle, Ranking Members Walden and Latta, and Senator Markey for their leadership in seeing this important piece of legislation through. I want to thank the President for his strong support of this bill. And I thank the American people for never letting us forget how fed up they are with scam, spoofed robocalls. It's their voices that power our never-ceasing push to fight back against the scourge of robocalls and malicious spoofing." (January 1, 2020) fcc.gov