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Etisalat sets new record as first Middle East brand portfolio to break USD 10Bn barrier

Eng. Saleh Abdullah Al Abdooli, CEO, Etisalat Group

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Editor's Note

Dear Reader,

Welcome to the latest edition of Teletimes International.

As we go further into 2019, we can see 5G becoming a reality – and that is leading right towards the enablement of the Internet of Things on a massive scale. Telecom networks are preparing for next-generation technologies and their innovative use cases. Along these lines, this edition includes insights into GSMA Intelligence research that reveals consumer views on 5g and the future of devices. The article "5G and Mobile IoT Prove Natural Partners for the Year Ahead" by Svetlana Grant, IoT Programme Director, GSMA is also an interesting read on the same subject.

Featured in this edition is an editorial on Etisalat, one of the leading telecom companies on a global level. Etisalat Group is confidently moving forward in enriching lives and enabling societies across it markets and the editorial talks about their vision, strategy and latest initiatives in great length.

In the latest news, one of Canada's largest phone companies is standing by its partnership with Huawei and you will find a detailed piece on that in this edition. As always, you will also find the latest insights and updates on all major players from the ICT space in this edition.

We look forward to receiving your feedback on info@teletimesinternational.com

Enjoy Reading!

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GSMA Intelligence research reveals consumer views on 5g and the future of devices

What to expect from the 5G era? Faster speeds and 5G smartphones? – Yes, Innovative Services and AR/VR? – Maybe

GSMA Intelligence, the research and consulting arm of the GSMA, has published the initial results of its latest Consumer Survey, providing a wealth of insight on consumer technology adoption trends set to shape the industry over the coming years. The new data forms the basis of two new GSMA Intelligence reports published at CES 2019. 'The Future of Devices' focuses on the global adoption and changing uses of smartphones into the 5G era, plus the growing popularity of smart speakers and other emerging consumer device categories, while '5G's Great Expectations' examines what consumers are anticipating from the first wave of 5G network and device launches.

"We are at the start of a new era of consumer devices that is being driven by advances in immersive reality and AI, creating a strong consumer appetite for products such as smart speakers and an important new battleground for the major tech players," said Peter Jarich, Head of GSMA Intelligence. "And while smartphones remain the dominant consumer technology, device vendors and operators are looking to 5G to unlock a new chapter in the smartphone growth story – even though our research suggests there is still work to do to convince consumers of the benefits of the move to 5G."

Among the key findings from the 2018 GSMA Intelligence Consumer Survey:

• The smartphone is now a nearly ubiquitous consumer technology; almost 90 per cent of consumers in developed countries own a smartphone, with an average of 2.5 smartphones in every US household

• Alongside the smartphone, the range of connected devices (and therefore internet access channels) is now greater than ever. The average US and UK household, for example, now owns six connected devices – from TVs to consoles to emerging categories such as smart speakers

• Smart speaker ownership rates have nearly doubled in developed countries over the last 12 months. For example, 16 per cent of US households now own a smart speaker, compared to 9 per cent a year earlier. Amazon and Google continue to dominate this sector, together accounting for 85 per cent of sales units worldwide

• Despite the early hype, adoption rates of VR headsets in developed markets have remained flat year-on-year at around 6 per cent of households and have even dropped in some key markets such as the UK. AR applications in fashion, gaming and various enterprise sectors are more advanced at this stage

• More than half of consumers in developed countries (54 per cent) expect 5G networks to deliver faster speeds, suggesting that early 5G promotional activity will focus on network speed as a key differentiator (versus 4G) – but it is not clear if consumers will pay a premium for faster speeds

• Only one in four consumers (25 per cent) expect 5G to deliver 'innovative new services', and only 20 per cent believe 5G will usher in a new era of devices

GSMA Intelligence's annual Consumer Survey covers 36,000 respondents across 34 key markets, using a blend of online and face-to-face sampling methodologies. The 2018 edition of the Consumer Survey forms the basis of the two new GSMA Intelligence reports published this week, which are available to accredited members of the press on request. T

ARTICLE

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5G and Mobile IoT prove natural partners for the year ahead

Svetlana Grant, IoT Programme Director, GSMA

There are times when some in the industry quietly wish 5G had been given another name. The capability leap is simply not comparable to that between 3G and 4G. As Intel's VP for IoT explains, "the 2G networks were designed for voice; 3G for voice and data; and 4G for broadband internet experiences. With 5G, we'll see computing capabilities fused with communications everywhere, so things like wearable devices don't have to worry about computing power, because the network can do any processing needed."

The tech world may seem mobile now, but it's about to become vastly more so – as the ability not only to connect countless previously standalone objects, but to do so with ultra-high speed and ultra-low latency as standard, transforms how we think about the role of connectivity in our lives. Around 25 billion connections are projected by 2025, a four-fold jump in less than a decade, and a disproportionate number of those connections will be mobile.

Much of the focus for the mobile industry in 5G's rollout over the next year will therefore be in conjunction with Mobile IoT – the family of technologies encompassing LTE-M and NB-IoT – providing greater support to manufacturers and ecosystem players, as the natural mechanism by which many 5G use cases will be brought to market. It became clear in Q2 2018 that – far from being in conflict or competition with one another – 5G and Mobile IoT are already playing a mutually complementary role in bringing about the Internet of Things. It was announced at that time that LTE-M and NB-IoT would be included in the 5G mobile standards set by 3GPP, which provided impetus to operators and vendors to support their implementation in IoT deployments. The harmony between the 5G and Mobile IoT allows the limitations of existing use cases to be laid bare, and surpassed, to the benefit of all.

Take for instance unmanned aerial vehicles, or 'drones', the civilian potential for which is becoming increasingly apparent to operators, civic authorities and a wide range of vertical industries. Existing connectivity for drones typically relies on point-to-point satellite control, which requires large numbers of control stations along the

flight path. The need to build and maintain these presents clear financial challenges, and limits the range at which most drones can operate at all – leaving them unviable for highly useful deployments in remote locations. The combination of LTE and 5G changes this completely, allowing the range and flexibility of non-line-of-sight transmission, while enabling cutting-edge security of on-board SIM.

There are overall three standout markets where the combination of 5G and Mobile IoT will be most pronounced in the near future; namely, smart homes, utilities and industrial IoT. Utilities form just one part of the broader shift to smart cities and smart homes, which are poised to make the jump from niche to mainstream phenomenon over the next six years – as consumers and civic authorities grow ever more conscious of waste with the onset of climate change, precision remote monitoring will quickly become an expectation, not an impressive option.

As the hype fades over truly autonomous cars, as consumers and policymakers realise they really won't be here much before 2025, automakers will focus on development of smart services for manual vehicles, chief among them navigation, in-car Wi-Fi, safety and infotainment. Car-to-car and car-to-road infrastructure communications, the ability of autonomous cars to drive without internet connectivity, and the no-collision tolerance demands of the public will not be widely in place before 2025 – the market will therefore focus on what is.

Much of the industrial IoT will depend on the low latency 5G offers to satisfy precision thresholds and real-time analytics, or investment will quickly dry up through poor early showing; its countless connected sensors will also require the low power demands of Mobile IoT, and the ability to operate with low-maintenance in harder-to-reach locations. The commercial importance of this can no better be illustrated than by the recent partnership between Samsung and AT&T, who announced recently they are working together on the application of virtual reality in smart factories through 5G.

So what will the year ahead actually look like – what are some key examples we should expect to see? One likely possibility is what might be called the 'Amazonification' of the IoT. Companies like Amazon are, as a result of improvements in processing and networking power, now able to radically simplify IT systems management for enterprise through delivery of cloud services. As, over 2019, the focus shifts increasingly from tech itself to the value of data, these complexity barriers will need to be addressed in IoT.

Businesses frequently report that their greatest concerns about IoT centre around complexity – that there are too many diffuse elements to manage, meaning projects either fail or never commence in the first place. There will therefore be a turning point this year, led by device-to-cloud IoT solutions, to deliver management of data, networks and security via a single integrated solution – and, from there, we can expect immense scale to be achieved.

The bottom line for operators is that with this enormous spike in deployments, particularly with the dramatic expansion into consumer markets on the horizon, there will be far greater demand on cellular technologies as a whole.

Among the key areas of collaboration between operators in the year ahead will therefore be roaming and interoperability: if a plethora of devices are newly connected at pace, and people themselves are increasingly mobile, how can we work together to avoid those user experiences proving a disappointment? These questions will certainly loom large in the Mobile IoT Summit at the Mobile World Congress in February, which is in effect the last before 5G starts coming into truly widespread use. Previous questions over how 5G and Mobile IoT could possibly come together will, by then, start to sound a little strange. T

Eng. Saleh Abdullah Al Abdooli, CEO, Etisalat Group

Etisalat breaks $10Bn barrier with widest ME brand

Leading the way to the future

Innovation and digital transformation are key to our success and a result of our strategy and vision at the next level of development that has led the company to play a greater role in the digital lives of consumers and enterprises. This forms the backbone of a robust and one of the most advanced, fastest and widest network in the region.

Infrastructure investments have been key to this growth and leadership in the market, this continuous investment have led to the modernization of mobile and fiber-optic networks and infrastructure development through investments in future technologies such

as IoT, AI and 5G.

Our robust network is a pillar in our long-term digital strategy that has helped in maintaining consistent leadership globally in setting benchmarks in the telecom industry. For instance, the UAE remains a global leader in terms of FTTH penetration, this enabled us to launch of innovative services meeting the growing demand and changing requirements of our customers. At the same time, Etisalat's 3G and 4G network coverage has set a benchmark by reaching 99.73 percent and 98.95 percent respectively.

Etisalat also recently was recognised as the 'The Most Valuable Portfolio Brand' in Middle East and North Africa (MENA) by Brand Finance for the 3rd year in a raw , as a recognition for the company's impressive portfolio of brands becoming the first Middle East group to break the $10 billion barrier in terms of wider portfolio value.

Today Etisalat boasts of a portfolio of brands such as Etisalat Misr, Mobily, Ufone, Maroc Telecom, PTCL and Etisalat Afghanistan. The company has also seen an 8 percent growth since last year, resulting in becoming the first Middle Eastern brand to hold such a wide portfolio. For the second consecutive year, Etisalat also retained its position as the most valuable consumer brand in the Middle East and Africa.

Operating in 15 countries 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.
Several factors have attributed to the success and growth of Etisalat's brand value mainly driven by an innovative customer service driven strategy, adapting well to a digital savvy marketplace, leading the 5G revolution and the successful launch of global brand building initiatives. 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.

Strong outlook and company performance
Etisalat continued to deliver on its promise of strong performance despite the increasing global economic challenges and the mounting pressure facing the telecom industry. We have showcased good results underpinned by our continued commitment and investments toward next-generation services and solutions, adding remarkable value to the communities we serve and enhancing customer experience.

Our corporate strategy have enabled us to consistently push boundaries, by responding swiftly to the global digital advancements and proactively delivering cutting-edge services and solutions to our customers. We will continue to focus on creating the world's best and leading networks across our markets to deliver long-term value to all our stakeholders.

Etisalat Group is confidently moving forward in enriching lives and enabling societies across its markets. As a group, we will continue our efforts to sustain a healthy portfolio that maximizes synergies, and focuses on enhancing customer experience.

Synergy among our operations
Etisalat efforts across its operating companies has helped solidify our position with our superior network, strong core business and new revenue streams.
With an international footprint that extends across Asia, the Middle East and Africa, Etisalat Group operates in a wide array of macro-economic contexts. Whilst the group anticipates market fluctuations and changes in certain markets, we expect to transform business and operating models with our dynamic and adaptable corporate strategy in order to thrive these varying contexts.
The successful launch of 4G services in Egypt was a testimony to our efforts and a key milestone in the country, as it served as a catalyst for economic growth and deliver benefits to the entire society.

Additionally with the deployment of VoLTE in 2018, Etisalat Misr has continuously played a significant role in the development of Egypt's telecom sector. In Saudi Arabia, Mobily's strategic vision under the Saudi Vision 2030 saw investments and partnerships to develop 5G and bolster the advanced network in the country.

Etisalat will focus on 'Driving the digital future to empower societies' to explore the future of connectivity as it fuels new technologies and services that will blend our different maturity levels in each market.

Journey and achievements in 5G
5G is becoming a reality in UAE, Etisalat's pioneering efforts in 5G will enable subscribers to enjoy technologies blending physical and digital realms from AR & VR to IoT, AI, autonomous vehicles, advanced robotics, 3D printing, wearable tech and more.

Our continuous investments and focus on enhancing and building one of the most advanced networks in the region have empowered digital transformation opening up opportunities to engage with our customers in new ways. Innovation was always at the core of our strategy to 'Drive the digital future to empower societies' putting our efforts on providing innovative solutions enabling connectivity, mobility, connected devices and IoT, energy efficiency, lower latencies and more reliability.

Etisalat embarked on its 5G journey four years ago when it started construction of the network with a dedicated team of engineers and specialists to build one of the most advanced networks in the region.
In the same year, a number of strategic partnerships were signed with global technology companies to carry out trials and implement advanced technologies and solutions on the network. A series of tests were carried out in the infrastructure to gauge the extent of 5G readiness and get an insight into the upgrades required to launch the 5G network first in the region. The goal was to get the network ready for data heavy applications and content to be broadcasted across media platforms during the Expo 2020.

Another significant milestone in 2016 was the successful completion of the first live 5G experiment using millimeter waves (mmWave). This showcase was the first of its kind in the MENA region with Etisalat becoming the first telco globally to test speed at 36 Gbps on a 5G network. This was followed with another global milestone in 2017 with a speed showcase of 71Gbps setting a new global record in data transfer speed using e-band and massive MIMO technology.

5G a reality for the next generation
Early in 2018, Etisalat set global benchmarks in 5G in technology and on the network. Etisalat successfully conducted a 5G trial with outdoor mobility. The trial demonstrated 5G capabilities in a real world environment over a live network, including tests on speed, latency and beam steering. The 5G trial system used 800MHz of spectrum in the 15GHz band, demonstrated over 20 times greater performance than what was currently used in 4G networks. The trial also achieved an aggregate site throughput of more than 24Gbps a significant improvement over current 4G networks.

Another major milestone for Etisalat and the telecom industry was the launch of the first commercial 5G wireless network in the UAE becoming the first telecom operator in the Middle East and North Africa (MENA) region to achieve this technological milestone and set an industry benchmark. Etisalat was the first operator to have a fully developed commercial 5G network available to provide gigabit internet services to its customers. The network will fuel enterprises digital transformation, IoT, smart cities and the fourth industrial revolution.

Etisalat's network will provide the most advanced digital and telecom services to Expo 2020 Dubai and its millions of visitors, supporting an expected 300,000 users on peak days. It will be a key component of the Expo 2020 'smart site', that will deliver a unique and memorable experience for the millions of visitors.

5G-Ready-Set-Go

Etisalat is now ready to launch 5G service for all consumers with its infrastructure and network equipped to support all 5G devices set to be launched by global mobile device manufacturers in 2019. With continuous investments in technology and innovation on the network, Etisalat's infrastructure can enable 5G connectivity today for all fixed devices expected to be launched in the first half of this year.

Etisalat's technical teams are building 5G network sites to enable 5G coverage across the country. Our network and infrastructure will be ready to provide the service as soon as the 5G mobile handsets are available in UAE. With 5G technology consumers will witness unprecedented maximum speeds of 10Gbps.

With majority of 5G deployments to be implemented by 2020 on a global level, by the end of 2024 industry estimates indicate a projection of 1.5 billion 5G subscriptions accounting to 17 percent of all mobile subscriptions at that time. Etisalat foresees the future of connectivity and is already exploring use cases with new technologies and services that will blend our physical and digital world.

Fostering innovation and entrepreneurship
Etisalat has always believed in the power of creativity long-term value and success by fostering the growth of tommorow's innovators and entrepreneurs. We are constantly looking to tap into the possibilities of the booming startup ecosystem. Etisalat is looking at nurturing entrepreneurial growth by creating partnerships that will provide them the platform to grow and showcase their abilities.

We were able to work together with these young innovators and entrepreneurs to imagine, design and co-create the future. Our teams focused on solving complex challenges while leveraging assets to create unparalleled opportunities. With the accelerator whose mission is to play a pivotal role in shaping the future of strategic sectors in the region, Etisalat worked with government entities and scaleups to co-create solutions to address both the local and global challenges of the future. This partnership was part of Etisalat Digital's strategy to bring the latest technologies and innovations to enable a smart ecosystem.

Etisalat has also collaborated with the open innovation ecosystem with its own innovation programme 'Future Now' that focused on introducing new ways of collaborating with startups, IoT developers, government entities, enterprises and end-users. Young companies will get a platform to engage with experts, have access to Etisalat's robust network and use digital technologies to build viable products and create new revenue streams.

The ultramodern 'Open Innovation Centre' provided a platform to showcase these digital technologies and was in line with the overall strategy to empower the society' across our customers and enabling them with solutions and services on this digital journey. Businesses had the opportunity to

experience Etisalat solutions applied in real-world scenarios and get a comprehensive view of technologies that deliver concrete business outcomes.

Our Digitisation efforts are not limited to business products and services but also in providing a digital experience for our customers. Customer experience has seen revolutionary changes using innovative digital platforms to interact and enhance the overall engagement while continually creating new innovative products and offerings to meet their changing needs and requirements.

For instance, Etisalat implemented advanced systems for in-depth analysis and Customer Feedback Management modules implemented across all touchpoints to collect on-the-spot feedback on customer interactions

Another example is speech analytics utilising next-generation tools and systems to analyse voice-based communications aiming at enhancing service quality and derive actionable insights to fulfill the needs and expectations of our customers better and ensure a seamless experience.
With our portfolio of services for enterprise solutions, Etisalat offers a wide range of integrated services, from office connectivity to networking solutions. Etisalat has tailored solutions for the SMB sector to deliver the best possible value and a competitive offering. We have set up a first dedicated business hub for SMBs that is committed to provide owners with tailored advanced solutions that increase their productivity and profitability.

Etisalat at Mobile World Congress 2019-Overview

We are stepping into an era, which marks the beginning of 'Intelligent Connectivity' underpinned by ubiquitous and hyper connectivity. This term is used to describe the powerful combination of flexible, high-speed 5G networks, the Internet of Things (IoT) and Artificial Intelligence (AI). This will have a significant and profound change on individuals, industries, society and the economy, transforming how we live and work.

Etisalat Group is at the heart of this evolution by taking great strides in the rollout of 5G networks. The focus at MWC this year will be engaging in discussions in the future of the network and at the same time expecting healthy debate on the new challenges and opportunities presented by the next generation of Technologies. T

Esharah Etisalat Security Solutions showcased Smart City Solutions at Intersec 2019


Ali Bahlooq

Esharah Etisalat Security Solutions, experts in the field of wired and wireless Telecom Networks (TETRA & Public Safety LTE), and Security Solutions showcased their latest and innovative products designed for public safety at Intersec 2019; an annual exhibition that took place from the 20th to the 22nd of January at the Dubai International Convention & Exhibition Centre.

The company was present at the event for all three days with its products and solutions which include a Biometric Checking via Secnet, an electronic verification of the ID document's RFID chip providing facility to query central police databases, and an integrated operations center demonstrating Video Analytics (FR, Object Classifications, Behavioral analytics), Smart Environment monitoring, Smart Waste management and Smart Traffic solutions.

The company also featured a live demo on the infection cycle of an IoT camera; demonstrating how the solution offers protection against malware through a combination of network, anti-virus protection and IoT anomaly detection. In addition, Esharah showcased Command and Control Software for Incident Management, latest mobile commands and patrols beneficial for police officers; and an Indoor Location Tracking solution used with TETRA radios to operate without the need for GPS satellites.

Ali Bahlooq, General Manager Esharah Etisalat Security Solutions commented: "Esharah has an accomplished history of bringing forth products, systems and services that contribute towards the safety and security of customers in all fields. In line with the revolutionary vision for Smart Dubai 2021, we are continuously working to implement systems that endorse the progression of security solutions in the market."

According to industry figures for homeland and commercial security, the Middle East market is expected to hit $25.3 billion by 2021. Furthermore, the regional demands for these solutions soars at an annual growth rate of 15% from 2018 to 2024. According to analysts 6WResearch, the Middle East market for commercial and cyber security, fire protection, smart home solutions, and drones, worth a combined US$7 billion in 2018, will grow to US$16.4 billion in 2024. T

At&T joins Global Cyber Security alliance formed by Etisalat, Singtel, Softbank and Telefónica

The Global Telco Security Alliance has announced the addition of global telecommunications leader AT&T as an equal partner in the grouping which was launched in April 2018 by Etisalat, Singtel, SoftBank and Telefónica.

The Global Telco Security Alliance brings together leading telecommunications operators from around the world with the main objective of offering enterprises comprehensive cybersecurity insights to help enterprises address the growing threat of cyberattacks.

AT&T's addition represents a significant step up in resources and insights offered by the Alliance as a whole. AT&T has long-established and extensive cybersecurity capabilities and technologies.

These were recently reinforced with the acquisition of AlienVault, which has enabled AT&T to accelerate delivering on its vision of enabling organizations of all sizes with effective cybersecurity solutions.

The inclusion of AT&T clearly reinforces the Global Telco Security Alliance's ability to share insights and best practices for customers globally.

Combined, all the members cover more than 1.2 billion customers in over 60 countries across Asia Pacific, Europe, the Middle East and the Americas.
The Global Telco Security Alliance plans to expand its scope of activities and global footprint over time and is open to bringing in new members in the future.

"We are thrilled to be the first telco in North America to join the alliance, and to do so as a founding member," said Barmak Meftah, President AT&T Cybersecurity and CEO of AlienVault. "Hackers have well established and organized communities that cooperate to produce cyber threats and it's time large network operators work together to help deliver disruptive innovations and enable our global customers to detect and respond to threats faster and protect their digital footprint." T

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In May 2018, Etisalat launched 5G C-band network as the first regional telecom operator

Expo 2020 first major commercial customer in the MEASA to experience 5G

Etisalat was the first telecom operator in the region to provide ultra-high 5G C-band data speed as a commercial service over the wireless network in May 2018.

This was followed by the prestigious and global achievement of connecting and announcing Expo 2020 Dubai as the first major commercial customer in the Middle East, Africa and South Asia (MEASA) region to access 5G services. Etisalat connected Expo 2020 Dubai to its 5G network, the first World Expo to be connected on this network.

Saeed Al Zarouni

Etisalat is now ready to launch 5G service for all consumers with its infrastructure and network ready to support all 5G devices to be launched by global mobile device manufacturers in 2019. With continuous investments in technology and innovation on the network, Etisalat's infrastructure can enable 5G connectivity today for all fixed and mobile devices expected to be launched in the first half of this year.

Expo 2020 Dubai was Etisalat's first major commercial customer in the Middle East, Africa and South Asia (MEASA) region to access 5G services. Etisalat connected Expo 2020 Dubai to its 5G network, the first World Expo to be connected on this network.

Saeed Al Zarouni, Senior Vice President, Mobile Networks, Etisalat said: "Etisalat's technical teams are building 600 5G sites to enable 5G coverage across the country. Our network and infrastructure will be ready to provide the service as soon as the 5G mobile handsets are available in UAE. Our management's strategy to focus on digital innovation and to 'Drive the digital future to empower societies' have led to investments in superior and state-of-the-art technology solutions on the network."

Al Zarouni added that 5G will radically change the lives of the subscribers in the country, he said: "With 5G technology consumers will witness maximum speed of 4.5Gbps and on 4G the maximum speed was upto 600Mbps. The network can now provide faster data connectivity combined with higher speed. The larger bandwidth will provide the capability to handle larger number of connections in any geographical area. With ultra-high speed and low latency services to the user 5G will enable users to enjoy uninterrupted 4K video streaming, best gaming experience, AR/VR services and autonomous transport. The 5G network will also empower government entities and the enterprise digital transformation, smart city development and the fourth industrial revolution."

Etisalat successfully conducted a 5G trial with outdoor mobility at its headquarters in Abu Dhabi in 2018. The trial demonstrated 5G capabilities in a real world environment over a live network, including tests on speed, latency and beam steering. The 5G trial system used 800MHz of spectrum in the 15GHz band, demonstrated over 20 times greater performance than what was currently used in 4G networks. The trial also achieved an aggregate site throughput of more than 24Gbps a significant improvement over current 4G networks.

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In the first phase of the 5G launch, fixed wireless services and mobile services will be provided in selected locations in UAE, which will gradually expand to other parts of the country depending on consumer demand and requirements. The commercial fixed and mobile devices will be available for consumers in this phase. Etisalat was aiming to achieve a download speed of 5Gbps for wireless access and more than 1.5Gbps for CPE (customer premises equipment) devices. T

Etisalat Award for Arabic Children's Literature enhances the skills of digital book apps developers

Etisalat Award for Arabic Children's Literature (EA), the most important children's literature prize in the Arab world, recently organised a three-day workshop on interactive media, during their participation at the Abu Dhabi Publishing Forum (ADPF) 2019, to develop the skills of children's book app developers who participated in the Award's 10th edition.

Organised by the UAE Board on Books for Young People (UAEBBY) and sponsored by Etisalat Group, the 10th edition of Etisalat Award attracted 13 applications representing several countries in the region, including the UAE, KSA, Egypt, Lebanon and Kuwait. However, none of these entries won the Digital Book App of the Year category, as they were unable to meet the Award's professional requirements.

EA's management then decided to channel the AED100,000 cash prize allocated for the 10th edition's Digital Book App of the Year category to conduct this workshop, which aims to support children's app developers and enhance their skills, enabling them to create interactive applications that meet the needs of children and young adults.

Marwa Al Aqroubi, President of the UAEBBY, said: "Technology has several unique characteristics, which can be harnessed to build learned individuals and elevate their knowledge. Hence, the focus on increasing the number of high-quality interactive applications for children by developing the skills and expertise of developers is a manifestation of Etisalat Award's strategy of utilising latest technologies to promote reading habits in children in ways that are fun, interactive and engaging."

Linking popular learning theories with futuristic innovations

The workshop discussed key children's development and growth approaches, as well as the latest technologies utilised in designing and creating interactive applications dedicated to children's Arabic books and children's activities in different age groups. The workshop also addressed key children learning and acquisition theories, in addition to showcasing the interactive media application that was developed by Lamsa Company.

The workshop was conducted by Badr Ward, CEO of Lamsa, the company that developed the application which won Etisalat Award's Digital Book App of the Year category 2017, and a jury member of Etisalat Award's 10th edition. He briefed the participants on the steps and techniques of developing interactive media applications and programmes, in Arabic, which considers the requirements of producing quality book apps that align with children's learning capabilities and skills.

The workshop focused on children's learning mechanisms, the importance of self-motivation, cognitive development and constructivism theory of learning by Swiss psychologist Jean Piaget and the impact of his theory on the art of app design.

The workshop concluded with several recommendations to further the success of designing and developing children's books apps. The factors taken into consideration are ideation, content creation, tying in the central message, illustrations and animation, music selection, and finally, app testing.

Sponsored by Etisalat group and organised by the UAEBBY, Etisalat Award for Arabic Children's Literature was launched to support and elevate children's book industry in the Arab world and honours special titles that address topics the appeal to children's interests and develop youth literature. It aims to motivate authors, illustrators and publishers to become more creative and innovative in Arabic children's books publishing field. T

5th Industrial Revolution and the Developing World

Artificial Intelligence I is on its rampant way now to be proclaimed as the basis for the next frontier for social, civic and business ecosystem that will connect M2M, M2P, P2M and P2P in the most efficient and cost effective manner.

Rashid Shafi

Nobody was believing when Japanese gurus proclaimed Artificial Intelligence (AI) alone as the new Industrial Revolution. We all have heard or read about the Industrial Revolutions that spun the socio-economic condition of the nations. According to the literature, we are in the 4th Industrial Revolution of nuclear energy, bio-technology, high-speed electronics, robotics, automation, big data, block chains and Internet & communications. The question is what Industrial Revolutions have been giving out to people?

It started in 1760 with the development of a Steam Engine, it transformed the society. Steam was powering everything from agriculture to textile manufacturing. With the advent of steam power, agrarian society gave way to urbanization. Distances were shortened, reach increased, manual labor minimized, machines were made to work by engines. Then in 1870, oil and gas were explored that replaced steam as the only energy source. This resulted in further efficiency of cost and labor. In 1969, the nuclear energy, bio-technology and electronic paved their way to industrialization. So we see, every industrial revolution brought a substantial increase in productivity through process efficiency and minimizing cost of operations. This gave a significant boost to economy of the nations that improved standards of living. A huge burden from man is lifted with the transfer of man-labor to machine.

We are now embracing the 5th Industrial Revolution. AI is on its rampant way now to be proclaimed as the basis for the next frontier for social, civic and business ecosystem that will connect machine to machine (M2M), machine to person (M2P), person to machine (P2M) and person to person (P2P) in the most efficient and cost effective manner. AI has and will have its positive effects in all domains of industry

and facets of life. The foremost implication of automation/AI may be making many people from labor class to semi-skilled workers will mostly be out of jobs. At the same time, economic dividend of AI may supplement funds towards development of skilled force to be utilized in AI ecosystem.

The main issue of the low paced developing countries is of poor governance resulting in increased poverty level of those countries. The low economy gear then becomes the impediment of development of socio-economic sector of the countries. These countries do not spend or invest enough on new technologies and waste a lot of resources due to poor governance. Should these countries adapt new trends in agriculture, industry, energy and services etc., a significant boost in economy can be witnessed. This economic dividend is then to be spent on education, health and disaster management thus kicking off a new economic cycle. Repeated continued economic cycles will result in sustainable development.

AI can be employed in a number of ways depending upon the need and readiness of projects. Carrying out small projects will lead into a sector improvement and thereby adding contribution to the wholesome of national economic growth. The foremost is the awareness and capacity building for the same. The culture in developing countries unfortunately is to follow the legacy and avoid change. Anyhow, we need to combat both cultural and capacity building issues.

There are various ways to create awareness, build capacity and bridging the technology. Both academia and private sector can play their respective roles in this. Their joint collaboration towards the cause could be the best remedy. One of the examples is setting up an IoT business and innovation center for capacity building. Internet of Things (IoT) is on its way to be proclaimed as the next frontier for social, civic and business ecosystem that will connect the resources and the users in an efficient and cost effective pattern.

The significance of IoT solutions is being largely acknowledged as transformative to businesses, institutes, societies and consumers, and the way each entity experiences, functions and innovates in the world. By introducing an IoT ecosystem, people and enterprises are able to access real-time data of resources halfway across the globe and make efficient knowledgeable decisions. These organizations can augment their solutions in the ever evolving demand-driven market. With rapid technological revolutions, the demand for IoT technologies as well as IoT and Cloud talent has skyrocketed, making AI skills the most sought-after talent around. This implies the need to educate and mentor young students who can then act as a catalyst of IoT deployment.

Pakistan has been one of the world's developing countries, providing a skilled tech-workforce of 1.3 million per annum. There's been adequate supply of Computer Science talent in Pakistan, but lacks an AI/IoT platform that could mobilize this talent supply to the right avenues, and contribute to the world's 5th industrial revolution, that's just around the corner.

Sync & Secure (www.esyncnsecure.com) was founded by innovative entrepreneurs in Pakistan with the vision of improving living standards of the country, from adding luxury and convenience to a simple home, to implementing a centralized security management for business corporations to ensure efficiency and productivity of business processes as well as elevating security standards. Sync & Secure established IoT Innovation Center (IIC) that aims to bridge technologies between the global industrial sector and academia, and build capacity. The objective of the establishment of this facility is to build industrial and academic relations on an international level, that aspires to contribute to world innovation, bringing organizations and educational institutions together to connect technologies and learning experience, as we believe that innovation has no boundaries.

IoT Innovation Center is a commercial outcome-driven research and innovation programme designed for students and fresh graduates to engage with latest IoT technologies, industrial IoT trends free of cost. IIC provides a research lab along with fundamental research tools with international affiliations to conduct research and contribute to real IoT projects and startups in Pakistan. This technological platform aims to provide students with adequate training, mentorship as well as an independent learning programme for them to instill their education in practical assignments and projects. Their contribution in research of various technology projects will play a major role in their ability to apply technical skills and learned knowledge to real-world market-specific scenarios. Our innovation center fills the gap between academia and IoT industry and serves as a bridge for students to traverse, and result in capacity building.

The programme constitutes of;

- Mentorship opportunities for enhanced guidance and leadership
- Diverse exposure to various business functions
- Accelerated learning environment through job rotation within and across functions
- Formal training to exercise their talents in an effort to choose a functional department
- Indulge in real-time project's research and development phase, and provide serviceable insights
- Explore technological trends and breakthroughs by primary and secondary research
- Achieve real-life context of business issues
- Major performers shall be awarded with;
- Job Placement in the company, company group or industrial alliances
- Incubation Centre – Here, the company will build, operate and manage the bankable case presented by the key performers. The company will also provide partnership modality with ownership stakes in the project

The programme is designed to provide a conducive platform to students to exercise their talents through generic and technical training in various disciplines, and welcome organizational and educational sponsorships. It is also open to forming affiliations with academia, industry and entrepreneurs to promote and support our cause.

I believe such programs in other areas of AI would be trend setters to create the awareness and build the capacity. Developing countries should come up with such ideas to embrace the 5th Industrial Revolution dividends. Should it be adapted with a resolve, it is not far to reach sustainable economic levels and improved standard of life. However, it is easier to be said than done if we are not serious with our people and country. T

MOCI representatives, Qatari businessmen and CEOs visit Huawei's Headquarters in Beijing

Representatives of Qatar's Ministry of Commerce and Industry (MOCI) along with senior officials, businessmen and CEOs of major Qatari companies have visited Huawei's headquarters in Beijing, China to gain a deeper understanding of how the latest ICT solutions can contribute to the digital transformation era.

The visit took place on the sidelines of the Qatar-China Business Forum, which was organized by the Ministry of Commerce and Industry on 31 January 2019 in Beijing. The forum brought together government officials and representatives of the Qatari and Chinese private sectors.

On the sidelines of the forum, Qatari and Chinese participants signed a number of memorandum of understanding in a bid to enhance cooperation in the fields of technology and information technology, promote the exchange of expertise and technical knowledge and bolster investment partnerships. These efforts will assist the Qatari government in its efforts to build a diversified, knowledge-based economy.

This visit to Huawei's headquarters is intended to strengthen cooperation between Qatar and China within the framework of the Qatari government's efforts to attract foreign direct investments into non-oil sectors. By channeling investments into its non-hydrocarbon sector, particularly its industrial, trade, and information technology sectors among others, Qatar seeks to achieve economic diversification in line with its National Vision 2030.

To demonstrate the power of ICT to accelerate the growth of all industries, Huawei gave the Qatari officials and businessmen insider access to their state-of-the-art laboratories and research centers as well as the opportunity to meet with top executives to discuss ICT's role in driving the development of key vertical sectors. This visit and discussions will help Huawei to better serve Qatar's national ICT and telecommunication needs in the long-term.

Frank Fan, CEO Huawei Technologies Qatar said, "Huawei is proud to be a key contributor to the State of Qatar's ICT industry since opening our first office in Doha in 2005, during which time we have consistently brought the latest in technological advancement and innovation to the country. We admire Qatar for its ambitious and progressive spirit in embracing and implementing state-of-the-art technologies and infrastructure nationwide. We look forward to our continued collaboration with MOCI and working together to make a deep contribution towards the success of Qatar National Vision 2030."

Huawei is one of several fully-owned Chinese companies with a license to operate in Qatar. Chinese companies that choose to establish a presence in Qatar can tap into a multitude of investment opportunities through development projects being undertaken within the framework of the Qatar National Vision 2030 and ahead of preparations to host the 2022 FIFA World Cup. In addition to being offered up to 100 percent ownership across various industries, Chinese companies may benefit from Qatar's strategic locale between East and West to expand their businesses to regional markets while enjoying the freedom of transferring capital to and from the country among other incentives. These include an advanced network of free zones and logistics and industrial areas in line with the highest international standards. T

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One of Canada's largest phone companies is standing by its partnership with Huawei

Telus backs Huawei as 'Viable and Reliable'

Telus Corp, sent a memo to employees last week, sticking by its work with Huawei. The memo was signed by Eros Spadotto, executive vice president of technology strategy at the Vancouver-based company. "Clearly, Huawei remains a viable and reliable participant in the Canadian telecommunications space, bolstered by globally leading innovation, comprehensive security measures, and new software upgrades," the memo said. It hailed the "positive, transparent and innovative-centric partnership we have enjoyed with Huawei."

From Telus's perspective, Huawei doesn't pose a security risk, according to a company executive, because it hasn't provided equipment to its sensitive core network and it operates under the close supervision of Canada's Communications Security Establishment.

The Vancouver-based Telus Corp. is among the handful of Canadian telecommunications companies waiting on a federal review into whether Chinese equipment provider Huawei Technologies poses a cybersecurity risk to development of next generation, ultra-high-speed 5G wireless networks.

Federal officials, however, are not signaling which way they might be leaning in evaluating potential participants in developing 5G technology here, though Huawei has operated in Canada for a decade under close supervision of the country's security establishment.

And when it comes to 5G networks, the Telus executive said that while the company has made some successful tests in making high-speed connections using Huawei equipment at its "5G living lab" in Vancouver, it hasn't yet issued any major tenders to provide equipment for its new network.

"We don't have a lot of 5G equipment deployed, because it's fairly nascent," he said. "Having said that, most of the (earlier-

Ren Zhengfei, Founder of Huawei

generation) equipment we have deployed is software upgradeable."

So excluding Huawei from Canadian 5G networks would be "a bit of a lost opportunity," he said, particularly since the supplier has a 12-to-18-month innovation lead on its competitors. He said Telus is also working with multiple suppliers and "Huawei doesn't have a lock on our 5G business," though there is not a long list of alternative vendors. At year-end news conference in Ottawa, Canada prime minister's Justin Trudeau said: Canada's decision on whether to allow Huawei access to its next-generation wireless network won't be a political one".

"It shouldn't at all be a political decision made on how we engage, but a decision made by experts and a decision based on recommendations by our intelligence and security agencies," he added.

Like Telus, Many European operators still see Huawei as their strategic partner that will play crucial roles in advancing the next generation of wireless technology. Huawei is still gaining foreign carriers' support on 5G.

Many European telecos are proceeding with 5G implementation with Huawei.

Some industry analysts have already suggested that banning Huawei will create a vacuum that no one can fill in a timely fashion, and may seriously impair 5G deployments worldwide.

In his last appearance in in a rare exclusive interview with CCTV in Shenzhen, Huawei founder Ren Zhengfei kept confidence in the company's cutting-edge technology saying: "Huawei is the best in the area of 5G, and the only manufacturer in the world that is capable of equipping 5G base stations with the state-of-the-art microwave technology".

Huawei is a global leader in the R&D domain, and strongly believes in continuous focus on R&D to achieve breakthroughs. Basic or "fundamental" research is key to Huawei. "This basic research will explore more for humankind... To build such a system, we have at least 700 mathematicians, more than 800 physicists, more than 120 chemists, over 6,000 specialists who are focusing on basic research, and more than 60,000 engineers", Ren said.

Huawei is cooperating with the Japanese government and bolstering purchases of parts in Japan

Huawei is cooperating with the Japanese government and bolstering purchases of parts in Japan to ease concerns that its products could be used in espionage or cyber-attacks by Beijing.

"It is just normal for the government, telecommunications companies and society at large to take an interest in security and the protection of privacy," Wang Jianfeng, president of Huawei Technologies Japan KK, said. "Compared with our rivals, we have taken more safeguard measures to ensure security, including the use of a third-party safety assessment organization," Wang added. T

Huawei launches 5G multi-mode chipset and 5G CPE Pro

Huawei officially launched its 5G multi-mode chipset Balong 5000 along with the first commercial 5G device powered by it, the Huawei 5G CPE Pro. Together, these two new products provide the world's fastest wireless connections for your smartphone, your home, the office, and on the go.

Balong 5000 officially unlocks the 5G era. This chipset supports a broad range of 5G products in addition to smartphones, including home broadband devices, vehicle-mounted devices, and 5G modules. It will provide consumers with a brand new 5G experience across multiple scenarios.

"The Balong 5000 will open up a whole new world to consumers," said the CEO of Huawei's Consumer Business Group, Richard Yu. "It will enable everything to sense, and will provide the high-speed connections needed for pervasive intelligence. Powered by the Balong 5000, the Huawei 5G CPE Pro enables consumers to access networks more freely and enjoy an incredibly fast connected experience. Huawei has an integrated set of capabilities across chips, devices, cloud services, and networks. Building on these strengths, as the leader of the 5G era, we will bring an inspired, intelligent experience to global consumers in every aspect of their lives."

Balong 5000: Ushering in the 5G era

With a small form factor and high degree of integration, Balong 5000 supports 2G, 3G, 4G, and 5G on a single chip. It effectively reduces latency and power consumption when exchanging data between different modes, and will significantly enhance user experience in the early stages of commercial 5G deployment. Balong 5000 marks a significant step forward for the Balong series of chipsets.

Balong 5000 is the first chipset to perform to industry benchmarks for peak 5G download speeds. At Sub-6 GHz (low-frequency bands, the main spectrum used for 5G), Balong 5000 can achieve download speeds up to 4.6 Gbps. On mmWave spectrum (high-frequency bands used as extended spectrum for 5G), Balong 5000 can achieve download speeds up to 6.5 Gbps – 10 times faster than top 4G LTE speeds on the market today.

Balong 5000 is also the world's first chipset that supports both standalone (SA) and non-standalone (NSA) network architectures for 5G. With non-standalone, 5G network architecture is built on top of legacy 4G LTE networks, whereas standalone 5G, as the name implies, will have its own independent architecture. Balong 5000 can flexibly meet different user and carrier requirements for connecting devices throughout different stages of 5G development.

Balong 5000 is the world's first multi-mode chipset that supports Vehicle to Everything (V2X) communications, providing low-latency and highly reliable solutions for connected vehicles. Huawei's 5G smartphones powered by Balong 5000 will be released at this year's Mobile World Congress in Barcelona.

Huawei 5G CPE Pro: Changing user experiences in home broadband networks
Powered by Balong 5000, the Huawei 5G CPE Pro supports both 4G and 5G wireless connections. On a 5G network, a 1-GB HD video clip can be downloaded within three seconds, and 8K video can be streamed smoothly without lag. This sets a new benchmark for home CPEs. In addition to homes, the Huawei 5G CPE Pro can also be used by small and medium-sized enterprises for super-fast broadband access.

Adopting new Wi-Fi 6 technology, the Huawei 5G CPE Pro delivers speeds of up to 4.8 Gbps. It is the first 5G CPE that supports HUAWEI HiLink protocols, bringing smart homes into the 5G era.

As a 5G pioneer, Huawei began research and development in 5G as early as 2009, and is currently the industry's only vendor that can provide end-to-end 5G systems. Huawei has more than 5,700 engineers dedicated to 5G R&D, including over 500 5G experts. In total, Huawei has established 11 joint innovation centers for 5G solutions worldwide. T

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CRA engages with IT sector for its 5-year strategy

The Communications Regulatory Authority (CRA) conducted a focus group discussion meeting under the title "Information Technology (IT) Sector Challenges" on January 21, 2019 at the City Centre Rotana Doha, attended by local stakeholders. CRA conducted this meeting to solicit feedback from major players in the IT sector as it develops its comprehensive Sector Strategy for 2019-2023, which will include CRA's goals and the mechanisms to achieve it.

Representatives from around 50 specialized local IT companies and entities attended the meeting, where they discussed their expectations and needs in the field, shared their experiences and opinions, and talked about the current challenges that they are facing.

Commenting on the meeting the President of CRA His Excellency Mohammed Ali Al-Mannai said: "This meeting is an important step towards developing CRA's IT strategy, as it is an opportunity for CRA to better understand the status of this sector, by engaging directly with stakeholders and taking their opinions into account. The strategy is in line with the Qatar National Vision 2030, as it supports CRA to enforce its mandate in a transparent and predictable manner, which contributes towards the sector's sustainable development and growth."

The IT Sector Strategy development will go through multiple steps starting with a sector review carried out by CRA to analyze regional and international trends and best practices in the field, leading to a public consultation where CRA will consider stakeholders' responses during the final development of the strategy. The new strategy is planned to be published alongside a related work plan by the second quarter of 2019. T

CRA Qatar meets with TRA Oman as part of the continuation of their cooperation

The Communications Regulatory Authority (CRA) met with Omani delegation representing the Ministry of Transport and Communications, Telecommunications Regulatory Authority (TRA), and Space Communication Technologies Company, at CRA headquarters, with the attendance of representatives from Es'hailSat, the Qatar Satellite Company. During the visit, CRA and TRA signed an agreement for coordination of satellite networks.

The signing of this agreement stems from the joint cooperation that started by an earlier visit from CRA to its counterpart at its headquarters in Muscat, where the two regulatory bodies signed a Memorandum of Understanding (MoU) to enhance their cooperation in the field of radio spectrum monitoring.

On the sidelines of the signing, the two parties discussed various matters of mutual interest and prospects for future cooperation, including signing another MoU for cooperation in spectrum monitoring during Qatar's hosting of the 2022 FIFA World Cup, exchanging of experiences related to satellite projects, in addition to training and development of Omani and Qatari competencies in the field of radio spectrum monitoring. T

We have secured many new projects from all corners of the world during 2018

InfiNet's solutions have been largely deployed to bridge the digital divide between urban and rural communities

Kamal Mokrani
Vice President at InfiNet Wireless speaks to Teletimes

Interview - Khalid Athar

Khalid Athar: Can you give us a quick overview of how 2018 was for InfiNet Wireless?

Kamal Mokrani: Thanks to our ongoing sales and marketing activities, coupled with the launch of some brand-new Software Defined Radio (SDR) product families, we have secured many new projects from all corners of the world during 2018. In particular, we have experienced significant growth from WISP's wanting to migrate their legacy WiMAX deployments to more modern broadband infrastructures. In Africa, for example, InfiNet's solutions have been largely deployed to bridge the digital divide between urban and rural communities.

We have also delivered multiple projects to the mining industry, for homeland security and border control, road and maritime traffic management, as well as for mobile operators looking to relieve their backhauling bottlenecks at the base station layer. We have delivered capacities of up to 1Gb/s, using less radio spectrum and achieving even lower latency, all at a very affordable cost.

Last year we grew our business by double digits and further strengthened our presence in key traditional markets such as the Middle East, Europe and Africa. We have also made major in-roads into emerging markets in Central and Latin America, as evidenced by the number of new projects won in various market sectors there. Finally, we have completed several multiple high-capacity projects for mobile operators in China, where our solutions have been deployed in extremely harsh environmental conditions and we have won against very stiff competition from lower-cost local vendors.

KA: What are the key challenges being faced by telecom companies today and what challenges do you foresee in the future?

KM: One of the major challenges operators face is around the adoption of 5G, as it relies entirely on the availability or freeing-up various chunks of the radio spectrum. There are many frequency bands between 3 GHz and 90 GHz being re-farmed by the ITU in general—as well as regulators in their respective countries—in order to achieve the performance targets expected from the 5G platforms. Freeing-up the required, but already scarce, radio resources is and will continue to be a real challenge for service providers of all types. Even if new 5G frequency bands have been identified and re-allocated, deploying the new infrastructure needed to deliver all future applications will require yet another massive investment by the telecom companies. And it is not only about installing new equipment on existing towers or roof-tops. Using a radio spectrum in the 28 GHz, for example, will require a major increase in the density

> 5G and IoT are expected to be major game changers for the next generation of technological platforms and associated applications and services"

of the infrastructure, i.e. physical locations of so-called "small cells" which will need to be located nearer the end users, every few hundred meters or so. Some service providers we talk to expressed doubts about the cost effectiveness of such a model since they are not just looking at CAPEX for these new 5G bases stations, but also additional costs associated with backhauls and ongoing operational and maintenance costs.

KA: The introduction of "connected" devices in every area of life has revamped the telecommunications and ICT landscape. What is InfiNet Wireless doing to enable this "Internet of Things"?

KM: 5G and IoT are expected to be major game changers for the next generation of technological platforms and associated applications and services. Their ultimate goal is to support the ever-increasing number of users by providing better speed, greater responsiveness, and connectivity to existing and future smart devices.

However, the requirements for managing such platforms in a cost-effective manner will create various new challenges. For instance, the need to support future and diverse applications will require higher capacity, more reliable connectivity, lower latency, access security, etc. All of these need tighter integration between the access platforms and the core and transport layers of a truly end-to-end and seamless fixed and mobile network.

At InfiNet, we recognised very early on that legacy cabled infrastructures can only take this technological revolution up to a certain point. Many of the unique selling points of IoT and 5G involve the necessary feature of mobility and hard-wired solutions will severely hamper the delivery of future applications and services. Wireless platforms, such as ours, present themselves as the ideal candidates for any service provider that is serious about deploying future 5G infrastructures.

Our long-term goal has always been to significantly boost population coverage of high-speed broadband, while at the same time minimising capital expenditure and unlocking additional value in the most cost-efficient way. Our ongoing dialogue with multiple stakeholders in the telecoms and ICT worlds gives our R&D teams the opportunities to understand their challenges, talk with like-minded experts and jointly contribute to the future of business and consumer communications As such we have become part of an open ecosystem that works together to realise these major game changers.

KA: Please tell us a little about InfiNet's Quanta and SDR technology.

KM: Software Defined Radio, or SDR, can be defined in multiple ways, depending on who you ask. For us, it simply means a wireless technology that enables us to meet changing needs of our markets and customers with mere software updates, i.e. where very little, if any at all, hardware changes will be needed to cater for future applications and services and where a network's operation and parameters can be changed and enhanced post-manufacturing.

In all fairness, the concept of changing the characteristics of a wireless unit or network through software has actually been around for many years, and was initially developed for military applications. We have studied in great detail, learned from such concepts and have developed our SDR technology as a viable commercial platform for service providers wanting to deploy technological solutions that can adapt to ever-changing wireless standards and customer needs. We have deliberately stayed focused on one of our core values, which is to design and deliver innovative wireless solutions, as evidenced by the recent launch of our new Quanta family of products, all based on our SDR platforms. Looking at it from a purely technical perspective, we have created a sustainable competitive advantage, offering new SDR solutions with major benefits to our end users, something other wireless vendors simply do not yet have. For example, we have optimized our underlying protocols and hardware platforms, which will deliver significantly higher capacity and performance, whilst requiring even less radio spectrum than is possible with today's technologies, e.g. up to 1.2 Gb/s in only 40MHz of channel size. Our new generation of SDR solutions will enable us to make the next leap forward by delivering future-proof platforms with advanced capabilities to help address increasing customer demands, new IoT and 5G applications as well as new service trends. In summary, our new SDR architecture will significantly help transform how people use technology in their daily lives.

KA: What do you think will be the earliest and easily adaptable 5G use cases?

KM: The adoption of 5G is not going to be an easy walk in the park and is not going to happen overnight as many people tend to believe. It will take many years and will be one of the most complex and challenging infrastructure-related endeavours to be designed and built. Over time, all legacy networks will have no other option but to transition to a data-centric model, where major performance improvements, in all elements of the networks, will be desperately needed to deliver the required super-broadband connectivity. Wireless solutions such as InfiNet's will certainly play a major role in the future of 5G and IoT.

The rationale for 5G has always been to overcome the known limitations of 4G,

such as subscriber capacity and limited data rates, and at the same time, to add significantly more capability for current and future applications. The main use cases we foresee over the next 3 to 5 years will include delivering ultra HD 4K video streams to both mobile and fixed devices, fast and secure connectivity for the retail markets (e.g. shopping, banking, etc), even smarter cities, widespread virtual reality content and remote health monitoring. We also expect a major case linked with the automotive and communications arenas, especially as the driverless car concept gains momentum, attracts more investments and gets finally accepted even by the most sceptical among us.

KA: On a global level, which markets and vertical do you see as having the most potential for growth?

KM: We expect the wireless industry to continue its current growth trend over the foreseeable future and play an even bigger role in delivering the communication platforms of the future. On the IoT front, we see enormous potential for growing our company and we are playing a direct and active role in providing the required connectivity to end users across the world. This is without doubt the biggest area of potential growth for companies like ours, operating in the wireless sphere.

We will also continue to focus on improving our solutions in order to narrow the gap between the rural and urban districts of cities, as well as deliver even smarter public security and video surveillance platforms to ultimately reduce violent crime and improve the overall security and safety of citizens and entire communities. As an example, this latter market vertical is particularly important for us in countries such as Columbia, where rising crime rates continue to stretch police and government resources. InfiNet is working very closely with the local authorities there to provide a state-of-the-art infrastructure to prevent drug trafficking and theft of remote government assets.

KA: What will be InfiNet Wireless' major focus for 2019?

KM: Our plan for 2019, and beyond, is to further consolidate our global position by developing new wireless solutions, tailored to meet the exact requirements of our partners and end users, wherever they are located, and in whatever market sector they operate.

This is indeed a strategic area of focus for our management team. Our aim is to enable seamless distribution and transport of content and applications by cooperating very closely with many of the big ICT and telecoms brands, to ultimately develop future-ready wireless solutions which will deliver advanced capabilities and benefits.

We believe firmly that our lives will need to be re-organised around the assumed existence of always-available and relevant information, which simply translates into the need for new technologies and more complex higher-order wireless infrastructures. Our current wireless solutions already enable devices of all types to seamlessly communicate with each another, but we intend to push physics to its limits and deliver even more than what was thought possible up to now. T

InfiNet Wireless to stage global debut of ground-breaking spectral efficiency solution at MWC 2019

The new 5 GHz point-to-point solution empowers service providers with the capabilities to launch innovative IoT and 5G applications

InfiNet Wireless, the global leader in fixed broadband wireless connectivity, will showcase the latest breakthrough in cutting-edge wireless technology at Mobile World Congress (MWC) 2019, where it will premiere its record-breaking spectral efficiency solution—Quanta 5.

Offering significant cost savings when compared to other cable and wireless solutions available, Quanta 5 is the first product from InfiNet Wireless designed primarily for the mid-size home and office market and service providers. The Software-Defined Radio (SDR)-based solution can be deployed easily and quickly in a diverse range of applications, from backhauling for Wi-Fi and 4G/LTE base stations to CCTV and video-surveillance infrastructures. It can also be deployed to provide internet access to remote locations.

With 14 Modulation and Coding Scheme (MCS) options, Quanta 5 is designed to offer the highest spectral efficiency and performance in less radio spectrum, even when operating in high interference environments and harsh climates including temperature extremes, thunderstorms and wind speeds of up to 160km per hour. These unique capabilities give service providers an all-in-one solution that can meet the increasing demand for bandwidth—allowing them to expand their service offering to include new and innovative Internet of Things (IoT) and 5G services and applications.

"Service providers today are having to deal with limited spectrum availability, growing interference and demands for yet more capacity, particularly as we see unprecedented growth in IoT applications and connected devices," said Kamal Mokrani, Vice President at InfiNet Wireless. "These challenges are only exasperated by the move towards 5G. Against this backdrop, it is vital that service providers have the tools to keep pace with these technology innovations and deliver the fast and reliable connectivity demanded by consumers and businesses. Quanta 5 empowers service providers to do just that by providing a high-performance, cost-effective, easy-to-install and future-proof solution."

The latest design allows new features to be implemented remotely via a firmware upgrade, even for units already deployed in the field.

InfiNet Wireless will be located in 1D80, Hall 1, during MWC, which takes place at the Gran Fira, in Barcelona, Spain, from Monday, February 25 to Thursday, February 28. T

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Reducing the Complexity of Selling and Buying

By Alvaro Sanchez, CEO, Integrasys

Selling and Buying are difficult, especially in these new times with HTS and a very diverse technologies arising. The way of selling and buying a service always come through the Link Budget, which can be daunting and complex yet an absolutely vital part of accessing satellite capacity. If not done or understood properly, it could be that the satellite chosen is not the right one for your application and consequently you may well suffer service loss, customers loose, unemployment issues or other costly major issues.

What is Link Budget?

Link Budget is a way of accounting for all the gains and losses on a satellite link. Gains and losses will always be there, but by calculating these accurately it is possible to ensure the optimum experience possible. It takes into account a number of different factors, including the losses in transmission line, gain of transmitting antenna, and loss over distance being transmitted, as well as the gain of amplification and losses of switching.

Satellite users need link budget calculations to determine which satellite and ground equipment is the best for the application and the location required, to give them the best possible service. Essentially, it enables them to check that the satellite selected will be able to provide the service needed before purchasing satellite capacity.

Satellite operators use link budget when establishing their satellite networks to ensure the best performance possible and also to demonstrate the capacity and suitability of their satellites to customers and potential customers.

On the other hand, customers need to run their link budgets to ensure that the service quoted is the right choice; in many cases it is very difficult to compare apples with apples.

Why Link Budget is Complex

Link budget is complex because it takes into account a vast number of different factors and requires extensive calculations. Also, for a user looking to work out the best satellite to use, they will need to run multiple calculations against different satellites and scenarios.

> "Satellite users need link budget calculations to determine which satellite and ground equipment is the best for the application and the location required, to give them the best possible service"

The challenge with link budget is the extensive complexity of doing calculations across a range of different parameters. To do it effectively, you need to take into consideration a huge array of parameters including uplink power amplifier gain and noise factors, transmit and receive antenna gain, slant angles and corresponding atmospheric loss over distance, climatic attenuation factors, satellite transponder noise levels and power gains, receive antenna and amplifier gains and noise factors, cable losses, adjacent satellite interference levels, and intermodulation interferences. This is further complicated by the fact that uplink and downlink frequencies are normally different so need to be calculated separately.

Most link budget calculation tools require input of at least 50 parameters. They are also generally really complex to use and understand the results. Therefore, for the most part they can only be operated by someone skilled in performing and

understanding these calculations. Often these are in short supply in most satellite companies, meaning it can take a while for link budget calculations to be performed and even longer for that to be translated into actionable information. Which creates a bottle neck in materializing business in our industry.

The Cost of Getting it Wrong

If link budget calculations are not done, or done incorrectly, the wrong satellite may be selected for any given application and result in a degradation of signal. Ultimately this means that the service being delivered will not be the best quality possible. The impact, of course, depends on the type of application. For a broadcaster or internet service provider, where consumers have no patience for any degradation in quality, it may mean a loss of subscribers, leading to a loss of revenue or bankruptcy.

It can be possible to offset any losses or gains using RF equipment such as amplifiers. This of course means additional cost to put extra equipment in place, which may not have been needed if a different satellite was selected. It is also extremely challenging to determine how much gain or loss is needed without an accurate link budget calculation. A trial and error approach is naturally not a great idea when trying to provide a service over satellite.

For the satellite operator, if they are unable to provide a link budget calculation, a customer may simply go to an operator that can in the first place. If a customer does come on board but the link budget is not done or not done well, it is likely to lead to dissatisfied customers who will then go elsewhere, whereas another satellite in the same network may have had a much better result.

Reducing the Complexity of Link Budget

Given the importance of link budget in the satellite industry, we wanted to make it possible for anyone to perform link budget calculations, and crucially understand the results so that they are useful and actionable.

Our new tool, Beam Budget drastically reduces the complexity surrounding link budget, while most tools need at least 50 parameters, Beam Budget is able to provide more than 75 results from just 25 inputs. Furthermore, it is really simple to use, both in terms of doing the calculations and viewing them in an easy-to-follow format. This means that anyone within the organisation can use it and view an intuitive graphical report in less than one minute, to enable them to select the best network.

As well as being a highly accurate link budget tool, it covers every modulation and is available for any frequency band. Users can easily export excel and pdf reports which can be shared with other stakeholders. Ultimately, Beam Budget minimizes time and effort while maximizing return on investment thanks to new sales generated by an easier quoting system which customers can understand in one view for materializing our business.

Today in a highly competitive market we need to improve our added value tools to close the business. Simplicity especially for non-satellite customers is crucial. T

Integrasys expands presence in Asia Pacific
Ronny Pramanta joins as APAC Sales Manager

Integrasys has announced it's expansion into the Asia Pacific. The company is establishing an office in Jakarta, Indonesia, headed up by a newly appointed APAC Sales Manager, Ronny Manurung.

Alvaro Sanchez, CEO, Integrasys, commented: "Satellite is increasingly important across Asia Pacific where it is enabling connections in sparsely populated rural areas and continues to be the preferred method of video delivery. Ensuring accurate setup and constant connectivity is critical to keeping these services on air and our tools can enable that. One of our recent successes is with Bank BRI providing four Satmotion Systems to deploy in ATMs".

Ronny Pramanta joins Integrasys with a strong background in the telco industry, most recently working with a number of

VSAT providers, including Metrasat and Patrakom, amongst others. As well as in-depth knowledge of both the satellite and telecommunications industries, Pramanta brings a strong experience in technical sales. Ronny Pramanta: "I am really pleased to be joining a great team in one of the most innovative companies in the satellite industry today. I look forward to serving my customers in the APAC region".

"Ronny Pramanta will play a key role in helping us to expand our presence across Asia-Pacific," added Alvaro Sanchez, CEO, Integrasys. "His technical understanding coupled with unrivalled sales technique will prove a valuable addition to the Integrasys team".

Integrasys provides a range of innovative tools aimed at automating VSAT commissioning and improving monitoring of VSAT networks to ensure accuracy and efficiency, while serving significant OPEX efficiencies. T

The business case for disaggregating networks in favour of All G helping telecommunications companies thrive, not just survive

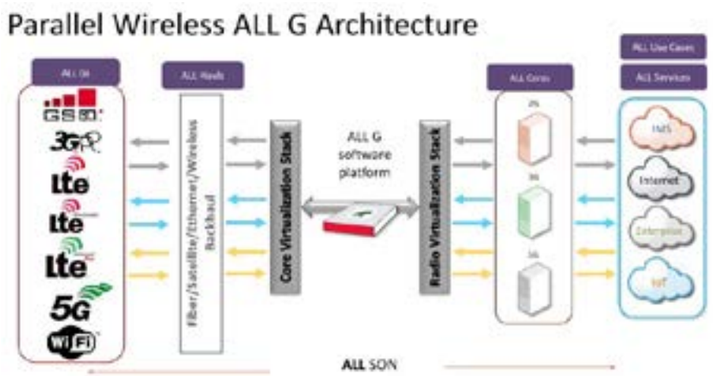
With 5G on the horizon, the economics of the mobile industry have to change. The layered approach of adding the next G (generation of mobile technology) on top of previous Gs and having to maintain them all as silos, is costing operators billions of dollars in CAPEX and OPEX. If MNOs do not find a way to virtualise and unify ALL Gs, they will not survive. It's as simple as that. But what to do about legacy software and hardware?

In a world that is expanding exponentially with technology, the development of a unified software solution that speaks to All Gs, was curiously slow, which is how US technology firm Parallel Wireless, found itself developing its innovative answer to all telecommunications companies burning question – how I keep my current infrastructure and yet make it work for me in the future.

The software-based approach to unifying all Gs, developed by Parallel Wireless, the leader in the provision of unified 2G/3G/4G/5G software, brings together all Gs under the same software umbrella and eliminates the need for operators to spend millions of dollars on new equipment and infrastructure upgrades.

This approach makes maintenance of all Gs simplified, while still ensuring that customers get the best possible service. In fact, this methodology is revolutionising the way that mobile operators the world over, are connecting their customers to 2G, 3G and 4G services. African and Latin American operators for example, are even moving ahead of their US and European counterparts through the deployment of intelligent and automated next-generation networks, capable of supporting ALL Gs under the same solution. This means they can provide legacy 2G voice services and newer 4G based media and entertainment services now, and well into the future, over the same network architecture.

Parallel Wireless ALL G Architecture



cope with the rising tide and not break the bank.

Crucially, Papa predicted that the telecoms industry would follow in the footsteps of Enterprise and adopt the Open Compute model. Papa felt it was only a matter of time before the telecommunications operators would begin to separate software from hardware and place RAN and core functions on commercial off the shelf (COTS) hardware and virtualized network architecture. This led to the development of Parallel Wireless' ground-breaking software-based ALL G (2G/3G/4G/5G) technology.

Papa wasn't surprised that the early adopters of this technology happened to be carriers serving emerging markets, as average revenue per user (ARPU) is very low in those regions. Mobile Network Operators (MNOs), think hard about how to cost-effectively deploy and maintain, to not just make a profit, but survive. One operator has used the technology across APAC to run 3G and 4G services on the same base station and saw reduction of 30% in OPEX while being able to deliver the same quality of service as on the legacy equipment. Now, that same MNO is working with Parallel Wireless in other emerging markets to replace legacy 2G equipment to run 2G/3G/4G services. It is using a Converged Wireless System (CWS) – an all-in-one multi-technology, software-defined GPP-based base station. This allows the MNO to replace legacy 2G systems with fully virtualized 2G technology, and to run 2G and 4G simultaneously on the same site to provide superior data and voice services to its customers.

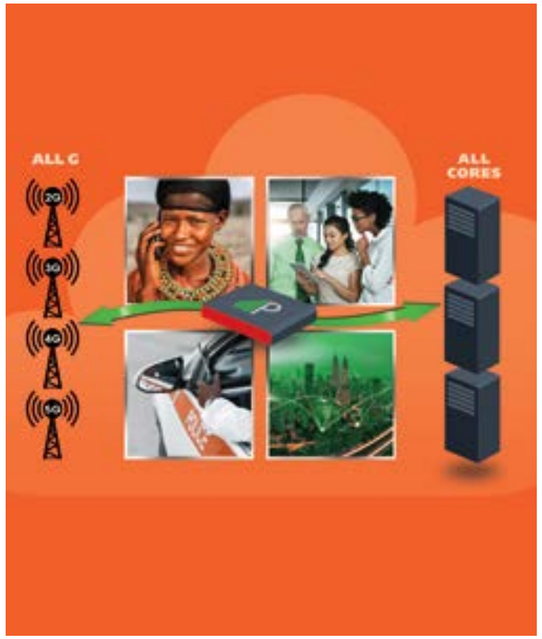
Multi-technology CWS nodes are easy to deploy and maintain and, enable a clear technology evolution from 2G to 3G, 4G and 5G, which does not require additional hardware installations. Parallel Wireless' software enables an Open RAN architecture by using standard-based and open interfaces between network components and as a result, simplifies network management and integration of new RAN products into the core of the network.

This software-based approach for older Gs is unheard of where, by virtue of the original design, it's impossible to reconfigure legacy 2G and 3G networks to support newer communications standards such as 4G, and eventually 5G. That problem is now a thing of the past, with Parallel Wireless' platform allowing operators to get the most out of their network assets and harness the cloud to future-proof their networks. The Parallel Wireless model is in line with operators' strategies to virtualise their network functions and dramatically reduce costs by running services over COTS hardware in data centres. Now, all Gs can be run under the same software umbrella.

The emergence of vRAN

To date, most operators have focused their efforts on virtualizing the core network, but there is also a requirement to virtualize the radio access network (RAN) and apply new equipment and software that can be automatically reconfigured to support a variety of radio access technologies. This has created what is known as virtual RAN (vRAN).

The telecoms industry is capital intensive, so every dollar and every cent spent on new infrastructure needs to be accounted for. The biggest expense for mobile operators has always been the RAN, accounting for around 60 per cent of CAPEX (and 65 per cent of



OPEX). Carriers are under pressure to demonstrate a return on CAPEX-heavy operations. With 5G coming down the line they need to maximise as much value as possible from existing network assets before giving the green light to new investment. Fiscally minded Western operators are looking to keep running costs down, maintain levels of service across all standards - from 2G to 4G - but also invest in projects that will create new value, and Parallel Wireless is providing them with the means to do so.

For Papa and his team, this is the realisation of a journey they embarked on over six years ago, when they first reimagined how mobile networks would look, as operators transitioned from being pure-play providers of voice and data to becoming the conduit to wireless broadband and digital services. 'Parallel Wireless has all the 'Gs' covered', giving operators the ability to deploy and maintain any generation of mobile network in a straightforward and cost-effective way.

After conquering markets in Africa and in Latin America - and earning plaudits from the likes of Telefonica and Vodafone (named as the best performing vendor across all Gs) and recently, being awarded the Aegis Graham Bell awards in two categories - Innovative Telecom Solution' and, Innovation in Smart City - Papa and his team have their sights firmly fixed on Europe and North America. They just recently announced two major wins on the continent - two smaller operators that are very cost-conscious and that are ready to move away from the legacy vendors, so their business can do more than survive – they can thrive. T

Parallel Wireless is exhibiting at MWC19 Barcelona (Feb 25-28). The company can be found in Hall 5, at stand 5i5.

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AITI holds "Smart Future Forum"
Encouraging innovation through emerging technologies in Brunei

Imran ul Haq

AITI organised the Smart Future Forum, which aimed to raise awareness on the benefits and opportunities of driving innovation and digital growth in Brunei Darussalam. Carrying the theme - "Innovation through Emerging Technologies", the Smart Future Forum explored how innovation relies on technology in countless ways. The forum also provided a valuable avenue to share ideas and approaches; to develop and communicate experiences and knowledge, in adopting smart nation initiatives and see how they might be used in Brunei Darussalam.

Present to officiate the Smart Future Forum earlier today was Yang Berhormat Dato Seri Setia Awang Abdul Mutalib bin Pehin Orang Kaya Seri Setia Dato Paduka Awang Haji Mohammad Yusof, Minister of Transport and Infocommunications. In his speech during the opening of the forum, the Honourable Minister highlighted the high level of infocomms connectivity; Brunei Darussalam's mobile broadband penetration rate has gone beyond 100 per cent since 2016 and as of 2018, has reached 130 users for every 100 people. According to the ICT Household Survey published by AITI in 2016, 75 out of every 100 households in Brunei Darussalam has access to the internet. The Honourable Minister went on to say that with this high level of connectivity, Brunei Darussalam is presented with the need to adapt to digital technologies in order to stay relevant and prepare ourselves for the implications from technological developments.

The Honourable Minister also outlined the Ministry of Transport and Infocommunications' (MTIC) approach towards preparing Brunei Darussalam to be a Smart Nation. The first, said the Minister, was infrastructure improvement through the development of a robust telecommunications infrastructure; a key component in order to create a secure and conducive environment to generate sustainable growth, productivity and facilitate businesses. Secondly, ensuring effective management and coordination of cybersecurity matters. In this regard, His Majesty the Sultan and Yang DiPertuan of Brunei Darussalam has consented for Minister of Transport and Infocommunications to be the Minister-in-Charge of cybersecurity. With this, coordination efforts among the relevant government agencies are in progress.

The third aspect, according to the Honourable Minister, was agility; with the Fourth Industrial Revolution looming ahead of us, there is a need for both the public and private sector to be more agile. This involves looking at our governance, processes and frameworks to ensure that they are responsive and relevant to the needs of the industry.

Finally, the Honourable Minister highlighted the importance of engagement; to have interaction and iterative processes with various domestic and international stakeholders in order to achieve a holistic and thorough policy consideration. Therefore, continuous industry and government engagement remains a policy priority for MTIC.

The Honourable Minister also emphasized the need to adopt a whole of government approach in the drive towards transforming Brunei Darussalam into a Smart Nation. Similarly, the Minister called upon the industry for their support, and encouraged relevant stakeholders to collaborate and work together to showcase IoT and Big Data applications, through the implementation of key pilot projects across various sectors.

Also in attendance was Dato Paduka Awang Haji Matsatejo bin Sokiaw, Deputy Minister of Energy, Manpower and Industry in his capacity as Chairman of AITI; Yang Mulia Pengiran Haji Mohd Zain bin Pengiran Haji Abdul Razak, Chief Executive of AITI; Yang Berhormat Dayang Siti Rozaimeriyanty binti Dato Seri Laila Jasa Haji Abdul Rahman, Legislative Council Member as well as Permanent Secretaries, Deputy Permanent Secretaries, AITI Members of Authority, Senior Government Officials and representatives from the private sector.

The two day forum brought together experts and speakers, from both local and international organisations such as the International Telecommunication Union (ITU), Asia Pacific Network Information Centre (APNIC); Singapore's Smart Nation and Digital Government Office (SNDGO) and Info-communications Media Development Authority (IMDA), Brunei Shell Petroleum (BSP) as well as local telcos - TelBru, DST and Progresif; speakers from the industry players such as Huawei Technologies Sdn Bhd and Ericsson; speakers representing the academia – from Universiti Brunei Darussalam (UBD), and startup company, Madgrow Tech Brunei. T

Konnect Africa to conquer the Ivorian market for high-speed satellite Internet access

Konnect Africa, an initiative of the satellite operator Eutelsat dedicated to satellite broadband on the African continent, has announced the launch of its Internet access offers in Côte d'Ivoire.

According to the Telecommunications Sector Observatory of the Telecommunications Regulator/ICT of Côte d'Ivoire (ARTCI), the number of fixed Internet subscribers (Ethernet cable, wifi and fibre) in Côte d'Ivoire stood at 155,541 in the second quarter of 2018, representing 0.6% of the total population.

At the same time, according to Deloitte's TMT 2017 report, the country has 9 million mobile Internet subscriptions, notably thanks to the 4G network. Some areas of Ivorian territory, however, are not properly served by mobile technology.
In order to make its services accessible to as many people as possible, Konnect Africa has joined forces with local partners in several major cities in Côte d'Ivoire, but also in remote areas: Lifi-Led, Watec, Open Services, HubLive and Ecosat.

Specialized in the telecom and technology sector, education, money transfers or audiovisual, these companies with various professions will enable Konnect Africa to address its future customers as closely as possible to their consumer habits.

Konnect wifi will provide Internet access at points of traffic such as shops, villages, schools, farms, hospitals, etc. in rural areas.

Access to the service will be through the purchasing of recharge vouchers, valid from a few hours up to 1 month. Currently undergoing the final testing phases, Konnect wifi will be available soon. T

HISPASAT and Media Broadcast Satellite to distribute the FunBox UHD Channel in EMEA

HISPASAT together with the telecommunications services provider Media Broadcast Satellite have reached an agreement on a deal with an initial duration of five years to distribute one of Europe's most important Ultra-High-Definition (UHD) channels, FunBox UHD, in Europe, the Middle East and North Africa (EMEA). The channel, which belongs to the content provider SPI International, is a thematic channel about nature, travel and adventure, art music, culture and lifestyle. Its content allows viewers to explore breath-taking places, witness important cultural events and watch ultra-high-resolution films thanks to the 4K technology, which reveals all the images' nuances and details.
The broadcast combines Media Broadcast Satellite's teleport capacities in Usingen (Germany) with HISPASAT's high-power 30W-5 satellite (H30W-5), with extensive coverage throughout the region specifically designed to distribute top-tier multimedia contents. This broadcast platform aims to become the most efficient and flexible medium for 4K channels to be distributed in Europe and North Africa thanks to HISPASAT's satellites in this region. Furthermore, this channel can be received in several cable-TV operator platforms in Spain, Portugal, Germany, Belgium, the Netherlands and Luxembourg, among others.

HISPASAT has supported the development and implementation of Ultra-High-Definition technology in order to make it available as soon as possible for cinema and television viewers. The company was the first satellite operator to make an Ultra-High-Definition broadcast in Latin America through the HISPASAT 30W-3 satellite. Since September 2013, the company has provided open-access broadcast of the HISPASAT 4K channel in Europe, made available to the industry to encourage the use of this technology.

Ultra-High-Definition TV quadruples the number of pixels compared with the traditional high- definition screen. The resolution is thus four times greater than conventional HD and it provides a much clearer image. T

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Dependability as a service: The key to a positive user experience

Marc Langston, Senior Product Marketing Manager
Enterprise Services - Intelsat

For more than 100 years, variations on the motto "the customer is always right" have driven the way in which businesses approach the people who buy their products and use their services. And although the word "always" might seem too strong at times, we can at least acknowledge that providing a consistently positive customer experience is a key driver to customer satisfaction, loyalty, and repeat business. Furthermore, while the "customer experience" defines the overall experience with a company or brand, the "user experience" (or "UX") is specifically focused on the end-user's interaction with a product or service.

In recent months we've seen a trend develop where our service-provider customers are acknowledging that a positive and consistent user experience goes beyond characteristics such as an application's visual design or the ease-of-use of a service or a low network ping time. Instead, a superior user experience is a combination of delivering a solution that accurately addresses a user's needs and doing it consistently. These service providers adopted our AgileCore UX trunking solution because they have factored in dependability as a crucial part of the user experience.

Dependability of service is key for all users regardless of location or application or usage. If a service isn't available when the end-user needs it, the rest probably won't matter. And while trunking is usually considered to be part of the way-behind-the-scenes network infrastructure, it's a component that underlies all those applications and services and end-to-end solutions. What's notable is that more service providers are specifically considering the impact of their choice in a trunking solution on their ability to deliver better services, improve the user experience, and drive their business forward.

These service providers all have access to alternative trunking services, including those that claim lower latency is the key to a better experience. Yet they've decided that latency isn't the sole way – or even the best way – to measure customer satisfaction. More important than that is the performance and reliability driven by thoughtful implementation of proven technologies, like those throughout Intelsat's global space-and-ground network.

Along with integrated traffic optimization that enables improvements of up to 50% in download times across a range of end-user applications, AgileCore UX is the dependable, high-performance backbone upon which our customers can reliably deliver solutions to their users.

It's also notable that no two service-provider installations are the same. For example, one of our customers in South America, unsatisfied with the reliability and service levels they experienced with a "low latency" operator, is making a straightforward cut to AgileCore UX. Meanwhile, on the other side of the globe, a customer in Northern Africa will use our service to improve the stability of another trunking service, and Intelsat will eventually bond and manage the two connections and integrate traffic optimization over the whole link. In Central Africa, we have the flexibility to quickly bring up service on a service provider's existing equipment allowing them to begin delivering user services immediately. Later we'll migrate the AgileCore UX service to higher-performance Intelsat EpicNG capacity, enabling them to provide the combination of performance and reliability they couldn't get with competitive services. In each scenario, the AgileCore UX implementation is tailored to meet the specific needs of the service provider and designed to improve their end-users' experience.

As end-users continue to raise their expectations for higher bandwidths and better performance, it's with the assumption that dependability is built in. We're seeing that enterprises and service providers are reconsidering what's important to them and the users they serve, defining user experience as the sum of many parts. Intelsat is also rethinking how we contribute to providing the best support and user experience for our customers and their end-to-end services. Solutions like AgileCore UX enable our service-provider customers to leverage new performance enhancing features without sacrificing the service dependability that's a basic building block of their success. T

Hellas Sat 4 successfully launched

Hellas Sat, a subsidiary of Arabsat, has announced that the Hellas Sat 4 satellite was successfully launched by an Ariane 5 launch vehicle from the Guiana Space Center in Kourou, French Guiana.

Hellas Sat 4 is a Ku-band satellite, positioned at 39 degrees East will provide exceptional coverage over Europe, the Middle East and the Southern Africa. The satellite is expected to commence service in the third quarter of 2019.

The new satellite will extend Hellas Sat's capacity and geographical reach to meet the growing demand for applications that include video, maritime connectivity, cellular backhaul, corporate networks and government services.

Hellas Sat 4 will also serve as a back-up to Hellas Sat 3 satellite which is located at the same orbital slot and was launched in 2017.

Christodoulos Protopapas, CEO of Hellas Sat, said: "Hellas Sat 4 is a powerful addition to our network and a major milestone to our business plan. It brings new capacity that will enable our existing and new customers to unlock new growth opportunities in applications including broadcasting, mobility and private data networks. Moreover, it will enable us to deliver high quality services at competitive prices as well as unmatched performance, resiliency and redundancy to our customers." T

OneWeb Satellites launched first satellites for the OneWeb constellation

OneWeb Satellites, a joint venture between Airbus and OneWeb, has launched first satellites for the OneWeb constellation.

The satellites were manufactured at the OneWeb Satellites facility on the Airbus Defence and Space Toulouse site and the first six have been shipped to Kourou for launch. The first launch of the mega constellation was launched on 19 February 2019 on a Soyuz rocket - the beginning of a long series.

With this generation of satellites, OneWeb Satellites is entering a new chapter in the story that started three years ago. "Our team is transforming the space industry and we are in the midst of demonstrating we can deliver on our promises," said Tony Gingiss, OneWeb Satellites CEO.

OneWeb Satellites will now turn its focus to ramping up production of the full constellation of satellites in its new factory in Florida, demonstrating once again the agility of this JV. OneWeb Satellites is a joint venture between OneWeb, a global communications company whose mission is to provide Internet to everybody, everywhere, and Airbus with its first order to include the production of ultra-high performance communications satellites.

The Toulouse OneWeb Satellites facility is being used to validate the innovative production methods necessary to manufacture these satellites at a scale never achieved before, de-risk any potential issues, and lay the framework for the larger multi-line OneWeb Satellites factory near the Kennedy Space Center, Florida. The satellites, weigh approximately 150 kg and will operate in near-polar, 1,200km LEO orbit. T

EVENT

27th Convergence India 2019 expo, the 3rd Internet of Things 2019 expo, and EmbeddedTech India 2019 expo opens with a special address by Union Minister for Commerce & Industry, Shri Suresh Prabhu

The 27th Convergence India 2019, the 3rd Internet of Things India 2019 and EmbeddedTech India 2019 expos, was inaugurated by Shri Suresh Prabhu, Hon'ble Minister, Ministry of Commerce & Industry and Civil Aviation, Government of India, at the Pragati Maidan, New Delhi. Organised by India Trade Promotion Organization (ITPO) and Exhibitions India Group, the event builds upon Government of India's 'Digital India' and 'Make in India' initiatives through a display of a vast array of products pertaining to fields such as ICT, IT & ITeS, broadcast & digital media, emerging technologies & enterprise solutions, virtual & augmented reality, artificial intelligence, robotics, cloud services, etc.

Speaking during the special address at the inaugural ceremony, Shri Suresh Prabhu, Hon'ble Minister, Ministry of Commerce & Industry and Civil Aviation, Government of India said, "This event is a true convergence of technologies and companies from around the world coming together to build a new global technology-driven ecosystem. I believe India has a very important role to play in this new world, not only as a nation capable of adopting new technologies, but also one capable of innovating and producing new technologies. We have many companies in the country that have already made a mark in their respective domains, and they now have the opportunity to work together on building holistic solutions needed for the future we are heading towards. I would like to congratulate Mr.

Prem Behl for organising this event on such a scale and I look forward to its continued growth in the years to come."

Delivering his Welcome Speech, Shri Prem Behl, Chairman, Exhibitions India Group, said "With an annual GDP growth rate of 7.4 per cent, India is already the world's sixth-largest economy and poised to become the fourth-largest consumer market behind the US, China and Japan. Consumer spending is expected to grow from $1.5 trillion to around $6 trillion by 2030. Much of this progress in terms of GDP and consumer buying has happened in the last five years or so."

Shri Behl added that e-commerce has emerged as the face of new India. With the Indian e-commerce market expected to grow into triple digits to $200 billion by 2026, one of the greatest impacts will be felt by the micro, small & medium enterprises (MSME). Another positive impact of this has been the rise in start-up sector. "Today, many start-ups are focused in mobility, e-commerce and other technology verticals. They are creating jobs and contributing to the economy, so much so that they have become the face of new India."

During the occasion, Shri Deepak Kumar, Executive Director, ITPO, said, "Interactions and interesting and educational sessions here will strengthen and facilitate government and private initiatives related to Digital India and Internet of Things."

The inaugural session also witnessed the release of a knowledge paper by MarketsandMarkets, titled "Internet of Things: The Next-Gen Revolution in India". The document offers in-depth analysis of how India is moving towards a digital economy. It also discusses the growth trajectory of India's telecom sector and explores reasons for increasing mobile and Internet penetration among masses.

"As a privileged partner of Convergence India 2019, MarketsandMarkets is honoured at the opportunity for furthering the event's value proposition. Drawing from our thousands of deep-researched reports, we will shine the light on the most relevant trends and disruptions prevalent in telecom, media and IoT. We will present crucial insights on the above three, including their current dynamics, in terms of both the market and under-girding technologies; and meticulous prognoses for six years down the line," said Sachin Garg - Associate Vice President, Emerging Technologies, MarketsandMarkets. T

28th Convergence India 2020 to include Fintech India expo; Focus to be on technologies that revolutionise financial industry

Riding high on the success of Convergence India 2019 expo, organisers India Trade Promotion Organisation (ITPO) and Exhibition India Group announce the inclusion of the Fintech India expo in the 28th edition of Convergence India expo, to be held from 19 -21 February, 2020.

Since the Internet revolution, financial technology has grown at a fast pace and moved out of back offices of banks and trading firms to the forefront. 'Fintech' now encompasses a variety of technological activities such as money transfers, depositing a check with your smartphone, physically bypassing the bank to apply for credit, raising money for a business start-up, or managing your investments without the assistance of a person. Today, fintech innovations are impacting traditional trading, banking, financial advice and products. The Fintech India expo will display applications and innovations in fields such as cryptocurrency, e-wallets, mobile banking and smartphones, cyber security and electronic trading. Also showcased will be latest developments in risk management, financial/capital markets, start-ups/financial investors, banks/insurance and much more. Over 20,000 people are expected to participate during the Convergence India 2019, 3rd Internet of Things India 2019 and EmbeddedTech India 2019 expos including key government officials, overseas and Indian business delegations, private players, as well as academics, innovators and students. The three expos are the focal point for businesses, start-ups and tech talent to meet with top investors, leaders and professionals.

Shri Prem Behl, Chairman, Exhibitions India Group said, "While India is home to many international financial institutions, its domestic banking sector is core to all financial activities. Both, public and private sector banks/investment and insurance setups are highly competitive and are bringing in software and applications to help secure data, instantly deliver services to customers, and re-design business models for bigger profits. To host an event that showcases latest technologies/innovations that would help them generate more business is the natural course for Convergence India to take." T

UIB wins the ninth edition of the Aegis Graham Bell Awards

UIB Holdings Pte. Ltd. (UIB) has won the ninth annual Aegis Graham Bell Award (AGBA) in the "Innovation in IoT" category for its UnificationEngine conversational IoT platform. Gartner Cool Vendor-designated cloud computing company UIB was recognized at a ceremony hosted by the Government of Goa at the Entertainment Society of Goa in Panaji. Late last year, UIB opened up a new AI Centre of Excellence in Bangalore, India.

UIB Chief Executive Officer Toby Ruckert said, "Five years ago, we brought together a small team of cloud computing engineers and entrepreneurs to find a way to solve the problem of how to simply communicate. How can we talk and text all of our different cloud-connected software, services, chatbots, and devices? What we invented, UIB's UnificationEngine intelligent IoT messaging platform, created conversational IoT."

AGBA Juror and Aegis School Of Business, Data Science, Cyber Security & Telecom Director Dr. Vinay Kulkarni said, "Their platform has converted science fiction to reality! Imagine 'talking' to any IoT device in any language, using any communication channel, traditional and modern and getting things done!

The UnificationEngine developed by UIB and their SmartContact concept can revolutionize how we interact with devices and machines. We often see people walking by talking into their cell phone, chatting with other people – well, now they can do the same with devices! I congratulate UIB on their unique innovation."

UIB Chief Technology Officer Aby Varghese added, "When users add a UnificationEngine-powered SmartContact® to their smartphone's address books, our AI allows them to talk to any connected 'thing' or service on over 20 of the world's most popular communications platforms, including email, SMS, smart speakers, social media messaging and chat apps. UnificationEngine works with WhatsApp (UIB is an official WhatsApp Business solution provider), Facebook Messenger, Viber, WeChat, Telegram, and many more."

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Varghese concluded, "What really makes UnificationEngine unique is its omnichannel messaging, its ability to operate any connected IoT device, its Natural Language Processing (NLP) engine's AI-independence, and its conversational analytics. It's a true honor to have our technology – and specifically, the impact our technology has had on helping our customers around the world to achieve their objectives – be recognized by winning the ninth annual AGBA."

AGBA has been promoting innovations in the Information and Communication Technology (ICT) domain, rewarding those who have been contributing in these fields, for eight years, with a vision to foster and stimulate innovators for India to become the nucleus of innovation. T

37 percent of organizations have implemented AI in some form - Gartner

The number of organizations implementing artificial intelligence (AI) grew 270 percent in the past four years and tripled in the past year, according to the Gartner, Inc. 2019 CIO Survey. Results showed that organizations across all industries use AI in a variety of applications, but struggle with acute talent shortages.

"Four years ago, AI implementation was rare, only 10 percent of survey respondents reported that their organizations had deployed AI or would do so shortly. For 2019, that number has leapt to 37 percent — a 270 percent increase in four years," said Chris Howard, distinguished research vice president at Gartner. "If you are a CIO and your organization doesn't use AI, chances are high that your competitors do and this should be a concern."

The purpose of the 2019 Gartner CIO Survey is to help CIOs and other IT leaders set and validate their management agendas for the coming year. Gartner gathered data from more than 3,000 CIO respondents in 89 countries across major industries, representing $15 trillion in revenue and public-sector budgets and $284 billion in IT spending.

Chris Howard

Game-Changer With a Talent Shortage

The deployment of AI has tripled in the past year — rising from 25 percent in 2018 to 37 percent today. The reasons for this big jump is that AI capabilities have matured significantly and thus businesses are more willing to implement the technology. "We still remain far from general AI that can wholly take over complex tasks, but we have now entered the realm of AI-augmented work and decision science — what we call 'augmented intelligence,'" Mr. Howard added.

CIOs have realized that sustainable digital transformation and task automation go hand in hand. AI has become an integral part of every digital strategy and is already used in a variety of applications. Survey results show that 52 percent of telco organizations deploy chatbots and 38 percent of healthcare providers rely on computer-assisted diagnostics. Other operational use cases for AI are fraud protection and consumer fragmentation.

The more organizations work with AI, the clearer the deployment challenge becomes. Fifty-four percent of respondents to a Gartner Research Circle Survey view skill shortage as the biggest challenge facing their organization.

"In order to stay ahead, CIOs need to be creative. If there is no AI talent available, another possibility is to invest in training programs for employees with backgrounds in statistics and data management. Some organizations also create job shares with ecosystem and business partners," Mr. Howard said. T

UIB signs three-year MoU with the Dubai Police to expand the use of AI

UIB advances Dubai Police's vision of pioneering policing and innovative practices for smart security services.

Unified Inbox has signed an agreement with Dubai Police G.H.Q. (Dubai Police). The agreement extends the two entities' partnership to a "broader spectrum in the field of developing and upgrading applications and innovative solutions that are derived by AI to support in the decision making process and statistical data analysis."

The signing ceremony took place in Dubai as part of the Dubai Future Foundation's Dubai Future Accelerators' (DFA's) fifth cohort at DFA's Emirates Towers headquarters. The agreement was signed by Dubai Police Brigadier Dr. Abdulla Bin Sultan on behalf of Commander-in-Chief Major General Abdullah Khalifa and UIB Director of Sales MENA Mr. Gulraiz Khalid Khan. Gartner Cool Vendor-designated UIB also participated in the DFA's third cohort in 2017.

Dubai Police Commander-in-Chief Major General Abdullah Khalifa said, "Our mission is to place Dubai among the safest and most secure cities in the world through smart, innovative services. We look forward to our continued collaboration and partnership with UIB to achieve our strategic goals."

UIB CEO Toby Ruckert added, "The Dubai Police has an impressive global reputation for their pioneering use of innovative new technologies to increase safety and security. We are honored to help them realize their vision of security for every citizen, resident, and visitor, contributing to Dubai's strategic goals."

Khalfan Belhoul, Chief Executive Officer of Dubai Future Accelerators concluded by saying, "We live in a fast-changing world and Dubai has long realized the significance of keeping pace with future technology and making the best of innovation to shape a better future. Dubai Future Foundation represents the tangible outcome of this vision to define the future in the present."

His Highness Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai and the Chairman of Dubai Future Foundation under the directives of His Highness Sheikh Mohammed bin Rashid Al Maktoum, Ruler of Dubai, created Dubai Future Accelerators in 2016 to make Dubai the birthplace for exponential technologies that will shape the course of humanity over the next century. T

How safe the fingerprint biometrics systems are?

My team member, looking very upset, came to tell me that he had just found three mobile connections registered in his name, whereas, he actually owned only one. Both of his disowned number was activated on same date in two cities over 100 Km apart and away from his native city. Smiling, I asked did he do any activity, where his fingerprints were taken? Yes! He had put his fingerprints and citizen ID number on a register, where he got a sale deed registered only two days ago. The fake mobile connections obtained through replica fingerprints on biometric scanners, a mandatory law requirement to verify the subscriber's identity, was everyday challenge many operators around the world are facing, while combating against SIM box and commission fraud.

The authorities, the institutions and the individuals all across the world use various types of biometric systems mainly to (1) ensure the authenticity of the person, before one is allowed to perform an activity, use the services, or accessing a device and (2) record keeping for future reference. The biometric systems include, but not limited to fingerprint, face recognition, DNA, palm print, iris recognition, retina, palm veins, odour/scent etc. The biometric systems are used for various purposes such as mobile connections, voting, property transfer, issuance of passports, bank account opening, attendance, issuance of driving license, immigration counters etc. The typical examples for mandatory requirement are Aadhaar (Targeted Delivery of Financial and other Subsidies, benefits and services) Act, 2016 in India, Biometric verification from NADRA

Ahmad Nadeem Syed

for mobile connection and bank account opening in Pakistan and mobile connections in Uganda.

Of various types, the fingerprints are the oldest and most commonly used, which are considered to be detailed, nearly unique, difficult to alter, and durable over the life of an individual, making them suitable as long-term markers of human identity. The computerization and digitalization has made it possible to take, keep, compare and verify large volume of fingerprints using various types of scanners in short time. There are mainly four categories of scanners: (1) optical, (2) capacitance (3) thermal and (4) ultrasonic.

The optical fingerprint device captures digital image of the print using visible light. This type of sensor is, actually, a specialized type of digital camera making a high-resolution image of the finger's ridges and valleys and in some types, the vein patterns beneath the skin as an additional security. The methods used to capture fingerprint images include touch, swipe, and roll, depending on the device.

The capacitance devices take the image, using the principles associated with capacitance, by measuring the voltage changes between the ridges having higher capacitance than valleys of the finger skin and thus generating varying signals. The capacitance devices could be passive or active types.

The thermal sensors take images on principle of temperature using difference between the finger skin and the air, meaning thermal resistivity and thermal capacitance. When the finger touches the sensor surface, the ridges transfer more heat than the valleys creating a variance used to develop the image. The thermal sensors are also active and passive.

The ultrasonic being the latest in imaging technology, use the intensity of reflected ultrasound, where the sensor can generate a 3D map of the finger surface. Unlike thermal, capacitance, and optical sensors, the ultrasonic fingerprint sensor could work through metal, glass, and other solid surfaces, making it theoretically more susceptible.

All these sensors are subject to exploitation, as proved by a Japanese cryptographer, Tsutomu Matsumoto in 2002, who had managed to fool fingerprint sensors by using a "gummy finger" made directly from a residual fingerprint left on a glass of a target finger. The film then was made into an etching, a mold was created, and a gelatin finger was used. The fraudsters use various techniques depending upon the type of installed sensors, the purpose, the possible spread, the level of collusion etc. The commonly known techniques include, but not limited to (1) fingerprint films (2) fingerprint molds (3) the database hacking or buying for optic, capacitance and thermal scanners. We however. don't have any knowledge of fooling of Ultrsonic sensor in this respect so far.

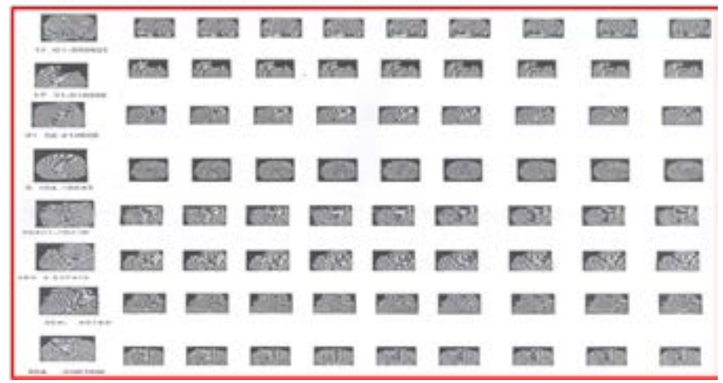
In a country, where fingerprint biometric verification is mandatory for getting mobile connection, the SIM box fraudsters were caught to have an Organized Crime Group (OCG) to arrange SIMs by fooling around the optical fingerprint scanners, the mobile operators had provided to their sales channels. These scanners are integrated with government's central citizen registration system on one hand and the CRMs of the operators on the other. The OCG which include some sales channels/

Fig 2: The fingerprint frames

staff, the fingerprint arrangers and the SIM box operators. These dubious sales channels engage people who take high contrast and good resolution (300-500 pixel per inch) pictures using DSLR cameras from the documents from the court, government offices, housing societies etc., prepare high resolution films with multiple pictures along with the relevant citizen registration number (Fig. 1). They were paid between US$ 0.25 – 1.5 per fingerprint picture which is shared with the holder of the documents or the record. These prints would be separated and packed in plastic frames in three to four unique prints per frame mentioning the associated citizen ID number to be dispatched to the counterpart sales channels in other parts of the country Fig 2.

Each picture (2D image), in these frames was put on the scanner, which would scan and send the print to the central database for comparison and verification. The success rate usually ranges between 75%-85% depending upon the quality of the image and the finally developed print.
Other scanners, which use more characteristics (electrical and thermal) than just the pattern of ridges and valleys as in optic scanners cannot be fooled by a simple 2D image. The fraudsters therefore use other techniques like molds and database stealing enacting the third dimension to mimic the other characteristics to fool the scanner.

Figure 1 – The Fingerprint film with multiple pictures



The molds are prepared by taking a fingerprint image or the original finger out of suitable material such as silicone, playdough, or the material used to make gummy bears. This ability has also made it possible to use 3D printer to create the fake fingerprint molds.

The third technique, the fraudsters use to fool the fingerprint scanners, is stealing and using the database which is not properly encrypted, from the systems used by the organizations in collusion with the staff holding such data. This is the most sophisticated technique requiring technically sound hackers to retrieve biometric data from the sensor's database, change the digital codes, reconstruct the fingerprints thus eliminating the need of the fake fingerprint on the scanner and using the same for the malicious purposes. This technique is more dangerous because it made it possible to be used in large volume. The use of this technique has been reported mainly to obtain mobile phone connections.

This ability of the fraudsters to fool around the scanners is not only a concern for the organizations from their businesses, the individuals from their interests, but also for the governments from security perspectives.

The manufacturers of the scanners remain busy in introducing new controls such as fingerprinting multiple fingers than simply thumb and using two than one hand for critical verifications. These controls have caused delays and caused complexity to the verification process in general as a result the single fingerprint scanner continues to remain majorly used tool.
Despite all the risks discussed above, the fingerprint scanning remains the most used biometric system being practical and economic around the world.
The risk managers therefore need to remain on their toes deploying, maintaining and keep updating an effective detective and preventive control framework to avoid any damage. T

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Lebanon's SmartEx Exhibition aims to position Lebanon as a regional hub for technology

Lebanon's leading international technology exhibition, has announced the new 2019 dates and is on the right track towards achieving an even bigger and better platform for the Technology industry. The 4-day event, opening on April 10th and closing April 13th, features hundreds of international and local brands representing several aspects of the technology sector; security, MIS, automation, retail tech., telecom, fin-tech, edu-tech, among others. Additionally, the exhibition hosts several free to attend educational seminars and workshops that add value to all attendees.

After the show's success in 2017 and 2018, SmartEx is back in its third edition with local and international brands, greater participation and a startup corner. The exhibition offers a unique platform for professionals to source from a wide range of technologies and business solutions covering small-to-medium sized business needs to large enterprise and corporate solutions.

The ICT and Telecom sectors are among the fastest growing in Lebanon. This positive performance has benefited from massive investments by the Ministry of Telecommunications in the telecom infrastructure, public sector efforts to transform into paperless environments and the growing demand for digital consumer solutions. According to IDAL this market is expected to grow at a CAGR of 9.7% over the through 2020. Not to mention the success Lebanon had during the CEDRE conference with $11 billion in loans granted to rehabilitate Lebanon's infrastructure, a big portion of which will be invested in this sector.

The international community, through a recent United Nations conference on trade and Development held in December 4th, has realized Lebanon's potential by mentioning "the country strong local private sector, skilled labor and strategic location are all magnets for investors" the report went on to conclude that Lebanon "can leverage its advantages as a destination for foreign investment in information technology and the digital economy."

The magnitude of the foreign funds granted highlights the trust and confidence the international community has in the Lebanese economy. Internationals are quickly realizing the potential Lebanon has, especially viewing Lebanon as a business hub for the region. By reopening trade routes to former conflict areas, Lebanon will play an important role in catering for the billions of dollars' worth of projects planned towards reconstruction efforts in the region.

Jason Rizk, managing director of MICE Lebanon, a leading exhibition organizer with over a decade of experience in Lebanon and the gulf, states that "through SmartEx our vision is to reposition Lebanon as a business hub for technology in the region, year on year we are providing an annual meeting place for the industry for professionals to share ideas and learn about the latest trends in the industry and equip all the right tools to further develop this sector." SmartEx, in its last edition has already attracted industry professionals from more than 12 different countries and has received the participation of some of the world's largest ICT brands.

In its third edition, SmartEx has received the full support and patronage from the Ministry of Telecommunications, is held in collaboration with The Beirut Chamber of Commerce Industry and Agriculture and has earned the support from the Investment Development Authority of Lebanon, Bank Audi, hundreds of leading international brands and major associations and syndicates.

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07 - 09 April 2019

5G MENA
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April 2019

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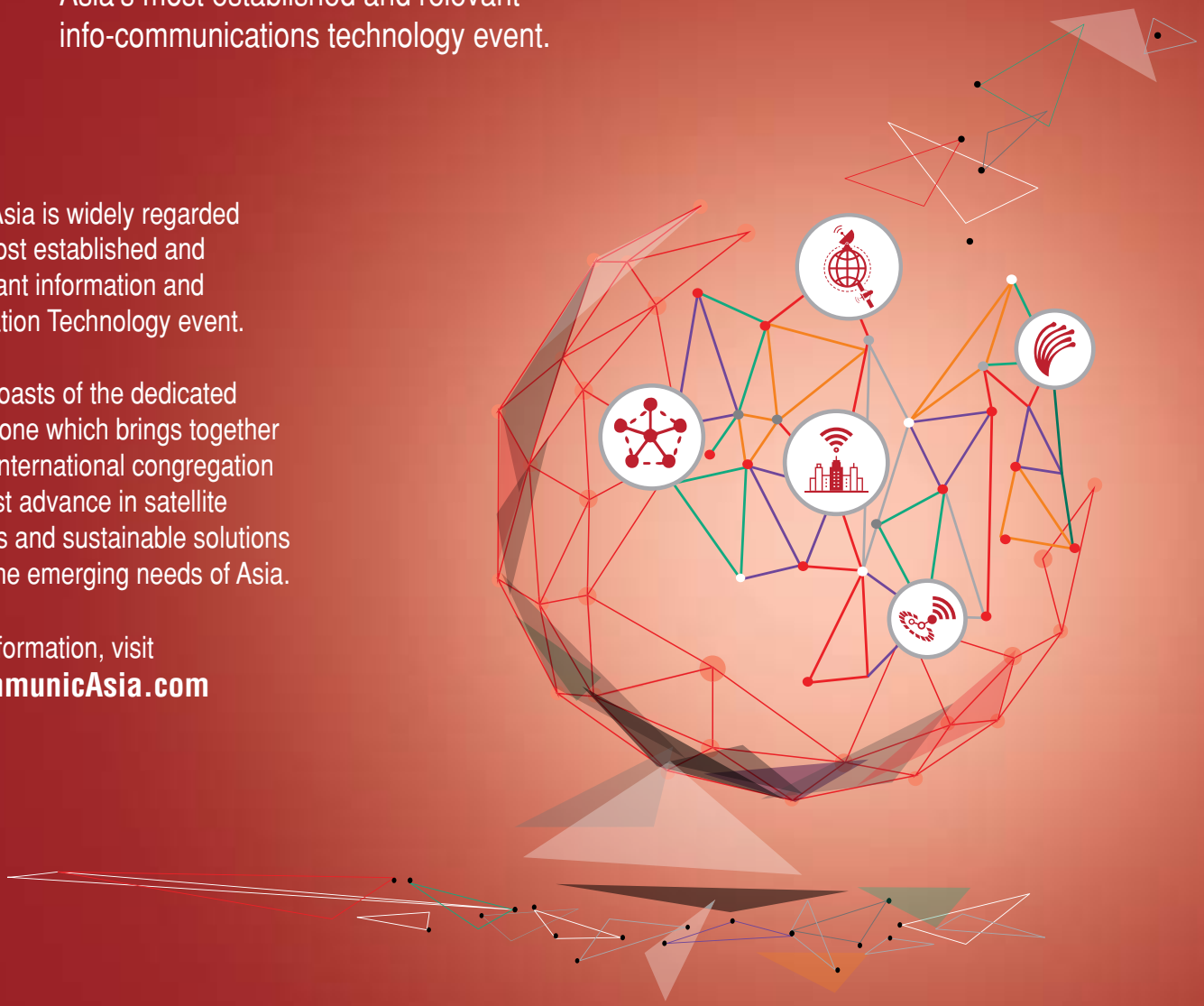

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