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digital to everyone"**

Charles Yang - President Huawei ME



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Editor's Note



Dear Reader,

Welcome to the new edition of Teletimes International.

Concluding what has been a "tricky" year, GITEX Technology Week took place in Dubai during December 2020, as the only tech event of such scale to take place in-person since the beginning of the pandemic. The event also indicated on what seems to be a turning point towards things returning back to a situation that is more closer to normal than what we experienced during the rest of the year.

One of the key participants of the event was Huawei Middle East. Charles Yang, President of Huawei ME spoke with members of the media at a roundtable; key takeaways from this discussion, along with important remarks by Charles and selective Q&A are featured in an editorial in this edition. Charles focused his briefing on Huawei's agenda to bring digital services to everyone around the world and Huawei's development's in its agenda within the region. He also deliberated on 5G developments and progress along with some insights on other verticals such as Artificial Intelligence and Security.

Another interesting editorial from GITEX is an exclusive interview with Chaudhry Fawad Hussain, Federal Minister for Science & Technology, Pakistan, who spoke up about his plans for the ministry and for making Pakistan's ICT industry and its capabilities more visible on the international landscape.

One of the other key participants at GITEX was Infinet Wireless which has been a major player in the wireless industry catering to multiple verticals and some niche demands as well. In this edition, you will find an editorial based on interviews with the CEO, the CTO and the Marketing Director conducted at GITEX.

As always, you will also find the latest news and updates from other major players in this edition of Teletimes International and your feedback on how we can improve our publication is welcome on info@teletimesinternational.com

Enjoy reading and stay safe!

Khalid Athar
Chief Editor



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Telco operators worldwide faced a challenge associated with the new normal in 2020

Top five telecommunications trends to watch in 2021

Igor Gorkov, CEO of Nexign

In 2020, telco operators worldwide faced a challenge associated with the new normal. Telecom operators played a prominent role in keeping teams together by effectively managing network bandwidth in residential areas across the variety of connectivity options. Since many companies will remain remote in 2021, CSPs can still support work-from-home trend and ensured employees' uninterrupted access to corporate networks by offering fixed-mobile convergence and setting app-based policies that prioritize the most critical business.

Operators are also exploring fully contactless retail models and investing heavily in robust solutions to optimize their coverage and network utilization to come fully prepared to the evolving service consumption model. While large-scale 5G deployments are still on the way in many markets, convergence and integration will be the key for the new offerings to gain momentum in 2021.

Igor Gorkov, CEO of Nexign, outlines five trends that will have a huge impact on the telecommunications industry in 2021:

1. 5G capabilities for industries

5G technology will address a wide scope of business use cases and open up new revenue opportunities for the operators in the growing market of private networks. Enterprises in the industrial sector will be assessing the commercial benefits of private 5G networks to fit individual requirements in coverage, bandwidth, latency and reliability. The licensed spectrum and ability to offer services on top of networks contracts will give operators a complete advantage in the verticals introducing eSIM-based M2M solutions in smart manufacturing and transportation.



2. A tangible value of eSIM

Operators will noticeably increase the support of eSIM technology. Still being a novelty in consumer handsets, eSIM turned out especially practical in wearables and smart devices, delivering opportunities for upsell by offering shared bundles for multiple devices or specific roaming services. Development of the digital service channels will enable operators to deliver a digital-first user experience and ensure a zero-touch activation during a pandemic.

3. Customer care going beyond telecom services

While stellar CX is becoming the main differentiator in highly competitive telco markets, CSPs are investing to deliver on the expectations of the new generation

of subscribers by utilizing a contactless omnichannel service model and using AI-driven tools for automated assistance. Following the experience during the pandemic, CSPs will prioritize the enhancement of self-service capabilities to reduce the cost of operations and reduce customer waiting-times. Integration with national identity management systems will facilitate personalized and frictionless access to smart city services (such as healthcare and education services) contributing to social resilience during the ongoing pandemic.

4. Operator's autonomy

The stress of COVID-related disruption, as well as security threats that never went away make operators carefully balance between cloud and on-premise solutions and pay closer attention to planning resilient georedundant solutions. No matter what strategy is chosen, CSPs are striving to build the internal expertise to avoid vendor lock-in and become true owners of the solutions they pay for, employing managed service only to handle specific applications. This is the area of joint innovation where the vendor helps the operator accelerate time to market for new services.

5. Global momentum for marketplaces

With the growing need to quickly obtain resources for the fast-track projects and offer the assets in surplus to their peers, operators are building marketplace platforms to streamline the lagging procurement processes. The new industry standards and emerging cross-border use cases will drive them to federated platforms offering a gateway to globalized markets. ■

Key learnings from the Gulf's early 5G success

Khalid Athar



The GCC has long had a strong mobile market that has constantly displayed innovation and leadership. Telecom operators had already deployed sophisticated 4G LTE networks that cover most of the population, nurturing an explosion of new digital content and applications. Furthermore, nearly all operators have now launched initial 5G networks and associated 5G-capable handsets.

Even with these commendable developments, the coming years will see

an even more rapid rise in 5G connections. Further, the advent of the Covid outbreak, and the resulting remote working/schooling has furthered the cause of digital transformation and is giving a boost to the overall ICT industry. In 2020 alone, the overall market for digital spending in the Middle East is expected to grow by a massive 26 percent compared to 2019[1]. And 5G is riding this growth wave and is expected to experience a phase of rapid adoption.

So while the 5G market and overall subscriber

base are poised to really take off in the region, there are numerous trailblazers from which we can take early learnings.

Telecom operators such as Zain, Etisalat, stc, and others, have been flagbearers in driving 5G momentum. Today Zain KSA, for example, has deployed an expansive 5G network spanning all regions of the Kingdom. Analysts have noted that the operator's ARPU for 5G users is over five times more than that of its non-5G ARPU[2]. In the UAE, Etisalat announced the rollout of

its 5G FWA services, allowing users to access innovative digital services such as streaming 4K videos, enjoying cloud-based gaming, and so on[3]. On a similar note, stc Kuwait has created a robust 5G devices ecosystem offering its users a variety of devices, bundled with 5G, to cater to all their entertainment needs[4].

Observing these milestones and others, one major takeaway becomes clear: those that have a clear 5G strategy and deliver on their 5G promises will reap enormous benefits. So while a robust 5G network is a baseline for these achievements, it is not an end in itself. Telecom operators are continuing to learn and evolve as they develop compelling offers that attract a larger 5G subscriber base.

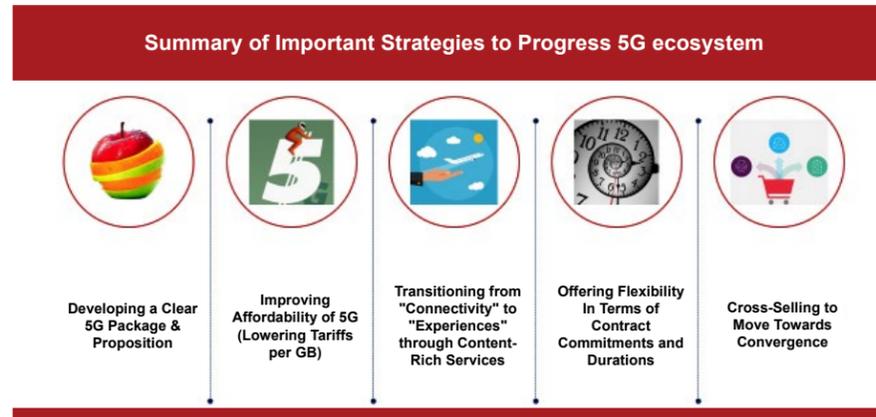
In particular, there are five important strategies that have shown enormous results in progressing the region's 5G ecosystem and operators' 5G businesses this year.

Developing a Clear 5G Package & Proposition

5G is a new proposition to many people and businesses, and that requires a special focus on marketing and promotions. Telcos must look at developing these clear 5G packages that are distinct from their existing portfolios. This can make 5G stand out in the eyes of the subscribers and ensure 5G has a brand-recall value. A clear 5G tariff plan also ensures that users know the real benefits that they are subscribing to, and feel motivated to try out the advanced features that 5G technology has to offer.

Improving Affordability of 5G (Lowering Tariffs per GB)

5G network and their maintenance are often agile and thus allow telcos to gain operations efficiencies (as compared to other legacy technologies such as 4G). Telco can do well to pass this benefit to the consumers. This will allow operators to offer larger 5G data bundles at tariff comparable to 4G (by lowering the price per GB in 5G) – which will act as win-win for both telcos and the user. The end users will accordingly be motivated to upgrade to 5G and get better data allowances, while telcos can expand their 5G subscriber base without having an adverse impact on their key financials. This strategy was very successfully adopted by the telcos in South Korea that offered more than 2 times data allowance in 5G (over 4G) at comparable



prices[5] – leading to a 5G subscriber boost that propelled South Korea in crossing 9.25 million 5G users within its 1.5 years of launch[6].

Transitioning from "Connectivity" to "Experiences" through Content-Rich Services

5G has the potential to offer a transformative experience to its users. Yet this can only be unlocked if subscribers have access to services such as gaming, AR, VR, 4K-video, and others. These services showcase the true power and superiority of 5G over other technology generations. Telcos that can offer this buffet of services to their users will enjoy higher engagement and will thus lead to better services monetization. It is no longer about just offering high-speed connectivity, but delivering on a digital lifestyle.

Offering Flexibility in Terms of Contract Commitments and Durations

Highly-priced 5G packages and long-duration commitments have been a prime impediment for subscribers in joining 5G, both regionally and globally. To address this issue, telcos need to be creative in the offers they make in terms of contract length, minimum monthly commitments, and included devices.

Cross-Selling to Move Towards Convergence

Historically, telcos have been running their mobile and fixed business as two separate entities with limited synergy. All this changes in the 5G era. Today there is a lot of cross-company and cross-portfolio synergies that are possible. This is a unique opportunity that some telcos are capitalizing on to harness the true power of 5G, and are accordingly reaping rich dividends from it.

The above five learnings can be equally adapted for the smartphone segment. It is an area that can benefit greatly from a focused 5G-centered marketing push, for example.

A lot of telcos in the GCC that are currently lagging behind in the 5G smartphone race can now look at these above learnings to help create a 5G proposition that is attractive as well as successful for the end consumer.

Overall, the year 2021 is expected to be another massive steppingstone on the Middle East's 5G journey. Telcos that can lead this transformation, and apply the best practices of the marketplace, will no doubt find themselves at the forefront of the 5G era in the coming decade. ■

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Huawei Technologies hosted the second edition of the Middle East IP GALA Summit. Held virtually, the summit entitled "Intelligent Connectivity, Enabling All Industries" saw the participation of Huawei IP product line experts, IDC analysts, and leaders from mainstream carriers in the Middle East.

During the summit, some of the hottest topics in the IP industry were discussed, including digital transformation requirements, network evolution challenges and technologies, and other topics.

In his opening speech, Vanness You, Vice President of Huawei ME Marketing and Solutions, said: "Industries in the Middle East are on the path to digital transformation and new services such as VR, AR, 5G will change the human society. Network is the foundation empowering all Industries and is the key in unleash any potential. As more aggressive services come in to cater to the SLA requirements, it's quite essential that we continue our

research in networking technologies such as slicing, intelligence, and programmability along with engineering methodologies and system architecture."

Kevin Hu, President of Huawei Datacom Product Line, shared Huawei's vision of building a better connected and intelligent Middle East. During his speech, he emphasized on the significance of digital transformation and how carriers would become a part of it as a key enabler.

The massive rollout of 5G use cases, adoption of cloud and increasing end-user service experience expectations require an intelligent IP network that can provide ubiquitous capacity, seamless experience, and IPv6+ technologies.

Hugh Ujhazy, Vice President of IDC Telecommunications and IoT, introduced the standards of KAI bearer networks for the 5G era.

According to IDC, the combination of DX

technologies (5G, cloud, IoT, and AI) would have a significant impact on all industries. Based on IDC research, telecom carriers face four challenges: surge in traffic and connections, flat revenue, and rising OPEX and CAPEX. To achieve the optimal transport network, IDC proposed a comprehensive indicator model that measures the transport network in five dimensions: Congestion Free, Always On, Scalable, Simplified, and Intelligent (CASSI Model).

Tony Hu, Vice President of Huawei Datacom Product Line, introduced the Target IP network towards 2025. Carrier networks are undergoing many changes and need to clearly define the vision for the next 5 or even 10 years. In-depth network convergence integrates mobile and fixed infrastructures to serve end-users and prepare for digital transformation of vertical industries in the future. From the perspective of architecture, Huawei proposes that the target IP network 2025 addresses all challenges and can guarantee a deterministic experience with intelligent operations.

Hacken Li, CTO of Huawei Datacom Product Line, introduced key technologies of next-generation intelligent IP networks. When it comes to autonomous vehicles, autonomous driving networks require 400GE and hardware slicing for a wider road with dedicated lanes, SRv6 as navigation, and iFIT as a sensor to bring massive data to the AI-based brain which ultimately makes the network smarter.

Carrier Pioneers such as STC Kuwait and Zain KSA introduced their network practices in building the next generation intelligent IP network.

As the summit concluded, carriers and industry experts agreed on how to drive the network transformation towards an intelligent era. Huawei reiterated its commitment towards cooperating with carriers and partners in building an intelligent IP network that can achieve a win-win future.

Huawei TrustInTech Summit 2020

Huawei also hosted its second annual TrustInTech Summit, which was attended by ICT industry experts, academia and economists from around the world. Speakers included Huawei's Executive Director of the Board and President of the Carrier Business Group, Ryan Ding, international investor Jim Rogers, GSMA CMO Stephanie Lynch-Habib, and others. Focusing on the new challenges the world faced in 2020, the Summit highlighted ICT's critical role as the key digital infrastructure to support societal wellbeing and economic recovery. Given the rising trend of technology decoupling, the Summit emphasized the need to embrace open collaboration, as well as the call to defeat the unnecessary fear of adopting new technologies. In 2020, ICT played a vital role



in resuming work and production during the pandemic. Meanwhile, 2020 has witnessed the exponential growth of 5G business applications. Global consultancy firm STL Partners estimated that 5G-enabled scenarios will raise the global GDP by US\$1.4 trillion by 2030.

At the Summit, STL Partners co-founder Chris Barraclough stressed the transformative role of 5G in manufacturing, energy, and healthcare sectors. Huawei Enterprise's digital transformation expert Edwin Diender also concurred, explaining the role of how 5G, AI, big data, and cloud computing pushed for faster drug screening and diagnosis, intelligent monitoring, and remote working and education during the pandemic.

GSMA CMO Stephanie Lynch-Habib shared that 5G's rollout in 2020 brought over 100 5G networks in 47 countries, and some regions are leading in making 5G a mature application. 5G will influence consumer-oriented industries such as e-commerce,

as well as boosting innovative services like virtual reality and augmented reality. Standard network slicing models and edge computing will provide high reliability, low latency, high throughput, and service customization.

During the virtual, live streamed event, Huawei Carrier Business Group CTO Paul Scanlan called 2020 a 'Sputnik' moment. "Similar to how the first man-made satellite Sputnik was successfully launched in 1957, bringing humanity into the age of space exploration, as 5G matured in 2020, everything changed," said Scanlan.

Professor Jin Keyu of the London School of Economics also echoed during the Summit, "[In today's world], it's less about competition, rivalry, and substitution, and more about collaboration, complementarity, and cooperation."

At the end of the summit, Ryan Ding, Huawei's Executive Director of the Board and President of the Carrier Business Group, emphasized that an open and trusted ecosystem is required for everyone to share the prosperity brought by technology. To do so, the ICT industry needs to continue adopting unified technical and security standards. Given the current complex geopolitical environment, he stressed, "Politics should stay away from technical issues. We need to remain fair and open to drive technological cooperation. Industry cooperation is not a zero-sum game. If an isolated approach is adopted now, while new technology is unlocking social and business value at a faster rate, the victim will not be one company." **T**

AI, Cybersecurity take centre-stage, as 40th GITEX Technology Week ushers in the return of global in-person tech events

The 40th edition of GITEX Technology Week, the only major technology event to go live in 2020, brought back in-person conferences, which saw artificial intelligence and cybersecurity experts shed light on issues including the ethical governance and associated bias with AI.

Day one of GITEX highlighted the 'Safest Cyberspace in the World' initiative by the Dubai Electronic Security Center (DESC), while H.E. Dr. Mohamed Hamad Al-Kuwaiti, Head of Cyber Security, UAE Government, discussed the importance of AI 'resilience' during the pandemic.

AI resilience during the cyber pandemic era

Traditional cyber threats, coupled with challenges brought on by the COVID-19 pandemic, have compelled organisations to look ahead and build resilient systems and processes that can better withstand future pandemics.

At GISEC, the region's leading cybersecurity conference, hosted under GITEX, H.E. Dr. Mohamed Hamad Al-Kuwaiti, Head of Cyber Security, UAE Government, discussed the cyber threat landscape, and how the UAE government is leveraging AI to build a more resilient post-pandemic world.

"It is important to build a culture of readiness, and that is why the National Cybersecurity Council was established by the nation's leadership. As the UAE ensures preparedness from cybersecurity attacks, public-private partnerships with industry vendors will play a vital role in strengthening the UAE's digital security. Phishing and ransomware remain the top types of cybersecurity attacks, while the financial and healthcare sectors are among those most targeted," said H.E. Dr. Mohamed Hamad Al-Kuwaiti.

DESC highlights 'Safest Cyberspace in the World'

With a broader aim of positioning Dubai as an international role model for cybersecurity, the Dubai Electronic Security Center (DESC) discussed the 'Safest Cyberspace in the World'

initiative at GISEC 2020, the region's leading cybersecurity event, hosted under the GITEX umbrella at Dubai World Trade Centre.

Dr. Marwan Alzarouni, Founding Member of Dubai Electronic Security Center (DESC) and Artificial Intelligence Ethical Committee, Director, Information Services, DESC, deep dived into the Dubai Cyber Security Strategy, explaining the goal of protecting Dubai from a range of cybersecurity risks and support the emirate's economic growth.

"The vision behind Dubai Electronic Security Centre is to make Dubai the safest city in the world in cyberspace by continuously overcoming cybersecurity challenges, pushing the envelope with technology utilisation to cater for our stakeholder needs as well as looking forward to the future. This realisation comes from establishing a strategy of 5 pillars as Cybersecurity, Cyber Smart Society, Innovation, Cyber Resilience, and International Collaboration.

"One of the key objectives of our Cyber Security Index is to enhance the readiness of government entities to deal with various cyber threat scenarios. The Index measures the performance of government entities in several areas, including the rapid response to security alerts, the number of incidents resolved, and the amount of data associated with the Security Operations Centre."

In July, Dubai launched the Dubai Cyber Index, an initiative that seeks to promote healthy competition among government entities in the field of cybersecurity and encourage the development of capabilities and excellence in this area.

IBM, Smart Dubai tackle AI bias

AI was meant to solve one of the biggest problems of our society - the problem of bias. However, when algorithms fed into computers and systems are trained on faulty, biased data they are bound to make mistakes, negatively impacting and influencing human experiences and decision-making.

Dr. Seth Dobrin, Chief Data Officer IBM Cloud

and Cognitive Software, Vice President and Chief Data Officer, IBM Analytics, IBM, was joined by H.E. Younus Al Nasser, Assistant Director General, Smart Dubai & CEO, Dubai Data Establishment, to discuss the issue on stage.

H.E. Younus Al Nasser, Assistant Director General, Smart Dubai and CEO, Dubai Data Establishment, said, "We are trying to create trust for AI. Explaining the technology is essential in order to build trust and to see its widespread implementation. AI offers so many positive applications. There needs to be transparency and we need to explain how data is being used to build this trust. Let's come together and try to explain what we are trying to achieve together. This way we can make AI even smarter and it will impact lives. If we want to make Dubai the happiest city in the world, we need to explain to people what AI does."

Throughout his career, Dr. Dobrin has generated value across a range of industries by applying data and AI ethically, and is currently responsible for the digital transformation of cloud and cognitive software operations using data and analytics.

Ethical governance of AI: How do you tame a wild horse?

Dr. Juergen Rahmel, Chief Digital Officer, AI & ML Advisor, HSBC, discussed why the full potential of AI can only be realised within a framework that supports trust and operates in a scope that benefits each stakeholder. Deep-diving into how he developed AI ethics and data principles which are now a benchmark for the Fintech world, Dr Rahmel said, "I like to compare AI to a wild horse. It has tremendous potential but needs to be harnessed in the right ways to become useful. We need to set up AI systems that are aligned with our existing ethical corporate standards and are placed within a framework that ensures human accountability and full transparency. "Talent is pivotal in developing a framework for AI ethical standards. Harnessing data doesn't just require experts to develop AI systems, but highly skilled experts to use them and extract useful data." **T**

“Our target is to bring digital to everyone; to build a fully connected and intelligent world!”

Charles Yang, President, Huawei Middle East

Huawei Middle East President, Charles Yang spoke with the media during a roundtable in GITEX 2020, where he provided an overview of Huawei’s current developments in the market and responded to the media’s questions which provided a further insight into Huawei’s positioning in the ICT market as a leading company. Following are some of the key points Charles shared in his briefing.

Q: Who owns Huawei and what is Huawei trying to achieve?

A: Huawei is owned 100% by our employees. Our target is to bring digital to everyone, every family and every organization, to build a fully connected and intelligent world.

In the past 30 years, we have deployed 1500 networks in 170 countries. Our equipment and service cover more than 3 billion population today. At the same time, we provide smart phones to serve at least 6 billion users.

Until Q3 this year, our revenue achieved 98.6 billion USD - an increase of 9.9% over the same period last year. It’s very difficult to achieve such performance under the huge pressure of coronavirus and the pressure from the US, however, Huawei is doing great. I appreciate the support from governments, partners, and our customers.

In the past 30 years, Huawei’s core values have never changed. Huawei is customer-centric and we try our best to create value for our customers. This is the reason that even under such tough challenges, Huawei not only survives, but continues to grow.

Focus on R&D

In the past 30 years, in order to keep the leading position in the industry, every year we invest more than 15% of our revenue to R&D. Last year, we invested 18.9 billion



"In the coming 5 years, we will invest 100 billion USD for R&D with a 20 billion USD investment each year."



USD for R&D. Our investment ranked No.5 globally across all the countries and all the industries. In the coming 5 years, we will invest 100 billion USD for R&D with a 20 billion USD investment each year.

As a leader for 5G, we don’t only pay attention to our technology, equipment and solutions, we also spend a lot of effort to build the ecosystem globally, especially in the Middle East. We think that if we build the best environment and ecosystem for 5G, it is also then that we can help our customers and partners and countries to fully utilize 5G advantages.

In the future, we firmly believe 5G, cloud, and AI will become the digital foundation for each country. Globally speaking, countries like China, South Korea, Saudi Arabia and UAE have already made such kind of national strategy.

Security with Huawei

In the past 30 years, cyber security and data privacy has been Huawei’s top priority. During the 30 years until today, no case can prove that Huawei has a problem such as spying and backdoor. At the same time, Huawei gives the promise to all the countries that Huawei has strong will to sign the no-backdoor, no-spy agreement with each country. In the Middle East, we have already signed the agreement with some countries.

Huawei capitalizes on local talent

We have been in the Middle East for 20 years already. Today, we try to make Huawei

"In the past 30 years, cyber security and data privacy has been Huawei’s top priority."

become a local company. In the past 20 years, we have helped the Middle East cultivate at least 100,000 ICT talents. Our local procurement achieves 1.5 billion USD each year. In the past 30 years after joint effort, there are more than 3000 partners working with Huawei and we are growing together.

Following the briefing, Charles Yang responded to the questions from the media during the roundtable, the excerpts of which are given in the following.

Q: How many base stations will Huawei deploy in the Middle East in 2021?

A: The development of 5G in the Middle East is among the fastest around the world, which is very good for the future of digital

"Huawei’s 5G market share in the Middle East has exceeded 70% to date."

transformation and the digital economy of the Middle East. Huawei’s 5G market share in the Middle East has exceeded 70% to date.

We help carriers and governments deploy 5G and develop use cases. How much we can deploy by 2021 depends on our carriers’ plans. However, I feel that 5G construction in the Middle East is accelerating. I think 5G in the Middle East should be at the same pace as China and South Korea.

At the same time, we have more than 1.1 million 5G users in the Middle East by the end of November. This is a great achievement. In less than a year, the number of users has reached 1.1 million.

Q: What cases will be used in the future besides 5G B2B? What are the advantages of 5G?

A: 4G changed life and 5G changes society. 5G features low latency, high bandwidth, and fast download speed, which support applications in many industries.

The greatest value of 5G is B2B. Today, we have demonstrated many B2B applications. We have cooperated with more than 5000 5G commercial projects worldwide. In the Middle

East, we are working with Saudi Aramco, UAE, ADNOC, and Dubai International Airport to enable vertical industries through 5G. Let me give you another example which goes beyond B2B.

5G can well support Cloud Gaming. In the whole Middle East, especially GCC, the people are very young, with an average age of only 26, and people like to play games. In the past, game playing depended on the performance of your terminal which would allow you to play the games, and game upgrades cost a lot of money. Nowadays, 5G is different for individual users. We put games on the cloud and connect them to 5G. You can play advanced games no matter what type of device you are on. This is the simplest case of 5G.

I'll give you another example, which is relevant to you. You are all engaged in the media industry. Before 5G, the media needed a large car to broadcast a large event. 5G is not the same today. We have a very small box that integrates 5G and supports three

significantly compared with that of last year. With regards to deployment though, there is a question. How do we deliver during such a situation? As an international company, Huawei aims to fulfill its obligations under our contracts, and is also responsible for the society. In this case, the air transportation cost has increased by 40-50% - we have to pay more for it.

Secondly, we have many subcontractors in each country and some employees of the subcontractors are unwilling to deliver the project due to the epidemic. Therefore, we pay a lot of extra costs to our partners to encourage delivery. In addition, our employees actively communicated with the government when others stayed at home during the epidemic. After obtaining permission, our employees insisted on delivering the project. Therefore, even though the outbreak occurred, our delivery progress was guaranteed and exceeded the customer's expectations. I think all these efforts have also effectively supported the fight against the epidemic.

the Saudi Arabia AI Summit, we signed a strategic cooperation agreement with Saudi Arabia SDAIA on future-oriented A.I. Our initial cooperation mainly includes AI talent cultivation, and Arabic language cooperation and Arabic speech recognition. Many people worldwide speak Arabic, as such this is particularly important. We have also started cooperation with UAE to help UAE build AI cloud brains. That is, A.I. technologies being used to build smart brains, which will greatly help city construction in the future. One major thing I also like to highlight about Huawei's AI strategy is that it is full-stack, full-scenario, and we are also an open platform.

Q: What is Huawei's corporate strategy under and after the epidemic? What are the expectations of Huawei's market share in GCC?

A: As I said, all activities have become online, including online medical care, online education, online shopping, and online conferencing. The traffic in the Middle East has increased rapidly, exceeding 40%. This speeds up the pace of 5G deployment. The epidemic changed a lot of habits. We and many of our industry partners are thinking about the post-epidemic era. Many habits will be inherited after the epidemic is over. The construction of the entire ICT infrastructure of cloud and A.I. will accelerate not only 5G construction.

At the same time, each country must stimulate the economy and address the impact of the epidemic on the economy. Each country has invested a lot in the digital economy. In the future, China will stimulate its economy and reduce the impact of the epidemic on GDP. By 2020, China will build 800,000 5G base stations. By the end of this year, China will have 200 million 5G users. South Korea announced its digital new deal in May, which will invest a lot of money in 5G artificial intelligence, cloud computing, and IoT. Germany plans to invest US\$4.4 billion in artificial intelligence, quantum computing, 5G, and 6G. In addition, it has added 6.1 billion euros to drive digital public services and smart city innovation. In this case, in the post-plight era, countries will invest more in the digital economy, and countries will adopt a lot of tax reduction policies and spectrum policies to support the development of ICT. From Huawei's perspective, we do our best, and use our solutions to help our carriers and enterprise partners succeed, and help the countries further improve their economy. **T**

"Huawei's AI strategy is full-stack, full-scenario, and we are also an open platform."

SIM cards. Then you can put the small box on your back, and then encode and decode the video while you are shooting it and play it directly. In the past, the traditional media vehicle may cost 10 million dollars to support you. Now we have a small backpack. None of this would have happened without 5G.

Q: During the outbreak, the need for network connectivity has increased significantly. How has 5G deployment globally progressed during the outbreak? What do you think?

A: Because of the epidemic, everything is online, including online education, online medical care, online shopping and online conferencing amongst other things. For example, in China, the traffic volume has increased by 40%. 5G plays a very important role at this time. Due to the epidemic, the entire Middle East has experienced a rapid 5G growth this year. The number of 5G base stations deployed in this year has increased

Q: Can you share a little about the progress in relation to 5.5G?

A: 5G deployment in China is fast. 5.5G mainly enhances some special industry applications. In China, we cooperate with the carriers in China. Once we have successful experience and results, we may consider copying it to the Middle East. 5.5G is still in the early stage of research. Technical research needs to be intensified, and it will take some time to convert technology to commercial application.

Q: Last year, Huawei made major announcements related to its AI capabilities and products such as Mindspore. Where is Huawei with its AI program in the Middle East?

A: We have been paying close attention to AI and have strengthened cooperation with other countries in the Middle East. I'll give you an example. Two months ago, at



Huawei selected by Emirates Group Security to build a bespoke digital command and control centre

Huawei has signed a strategic MoU with Emirates Group Security (EGS) to build a digitally-driven Command and Control Centre, incorporating cutting-edge technologies and video cloud solutions to amplify its surveillance and security capabilities.

Huawei's partnership with EGS will enhance its existing infrastructure by extending EGS's Solution Architecture and Design, ensuring that the Video Surveillance Solution and Command and Control Centre platform will form a reliable security model in the UAE aviation sector. The collaboration between the companies will also promote an exchange program that covers security, technology, training, education, and other relevant topics. The exchange program will mutually focus and aim to heighten security talent development and foster innovation.

Dr. Abdulla Al-Hashimi, Chief of Group Security said: "Our partnership with Huawei on multiple projects over the years has strengthened our relationship, making them the ideal choice for elevating our



security systems with next-generation technology solutions. Our shared principles, way-of-thinking, and thirst for innovation will not only support the UAE but also the global aviation industry."

Jiawei Liu, CEO of Huawei UAE, said: "Emirates Group Security has been a long-term partner for Huawei, and we are very pleased to have been selected to expand our collaboration with them. Smart technology contributes significantly to improving the

efficacy and reliability of security efforts, with cloud-based systems providing an ideal platform for robust networks that provide all of the support, flexibility, and accessibility that EGS requires."

The two companies will also work together to represent the realm of general and aviation security technology during local and global events, such as GITEX, AVSEC Global Symposium, Huawei Global Connect, amongst other upcoming events. **T**



Interview: Khalid Athar

"I am a great believer in enabling multinationals' and large enterprises' entry into the market"

Fawad Chaudhry, Federal Minister for Science and Technology, Pakistan

2020 was overwhelmed by COVID-19. Almost all the mega events of ICT & Telecom were either cancelled or were held virtually. Dubai Government took a bold step and allowed Dubai World Trade Center to hold events in-person (with complete observation of all SoPs). During GITEX Technology Week, from 6th to 10th December 2020, a few other conferences and events were organized at its sidelines as well but still GITEX this time was not at par to its former traditions in regards to the number of exhibitors and visitors; nevertheless, the event taking place in itself was very much encouraging and an admirable step.

The ICT and Telecom Sector in Pakistan have made notable progress during the last two decades, but the capability and prowess of Pakistan's ICT space and human resource has not been visible at the international level, especially major events at regional and global levels, as it should have been. Only a few organizations from the country have been participating in international events such as GITEX Technology week, Dubai and GSMA Mobile World Congress (MWC), Barcelona. While the participation has sometimes been facilitated by PSEB or by TDAP, there is perhaps more room for this to be done more regularly in an organized manner.

The representation of Pakistan at GITEX 2020 was quite minimal but the active attendance of the Federal Minister for Science and Technology, Chaudhry Fawad Hussain was a hopeful sign. Fawad Chaudhry is a highly efficient, young and dynamic Federal Minister and endeavors to make his ministry productive and vibrant to the maximum extent.

Huawei Technologies, Middle East actively participated in GITEX-2020 as usual and with the coordination of the Public Affairs and Communication Department (PACD) of Huawei ME, Teletimes got an opportunity to have an exclusive interview with Federal Minister of Pakistan Chaudhry Fawad Hussain at Huawei's stand in GITEX. The excerpts of the interview are given here for the interest of the readers of Teletimes International.

Khalid Athar: Would you like to briefly talk about the purpose of your visit to GITEX?

Fawad Chaudhry: GITEX is one of the major exhibitions of the IT and telecom industry. We can see many major regional players participating here including Huawei which is obviously a major player in Pakistan in Pakistan. They are infact one of the most active companies here. I am keen to see the technologies being demonstrated here and see how we can take these to Pakistan whilst bringing the very capable and advanced tech enterprises / workforce from Pakistan to such platforms.

KA: How do you see GITEX as a platform for Pakistani tech companies to get exposure and growth?

FC: I think all exhibitions of reasonable scale are important and we must have presence there but GITEX with its scale and quality of participants is especially important.

I see that there a few companies present here in private capacity, but we are missing participation at the government level. The main reason behind that being COVID.

TDAP has been involved with the private participants. Perhaps, in the future we can make more arrangements as I believe we really need to have our companies and our talent come out to these exhibitions and trade shows to demonstrate their capabilities to the world.

"Huawei plays a very important role by bringing in a corporate culture in the field of telecommunication and modernizing the tech space."

KA: Can you elaborate on Huawei's contribution to a Digital Pakistan?

FC: Huawei has made significant contributions in the Pakistan ICT space. Personally, I am a great believer in enabling multinationals' and large enterprises' entry into the market because they uplift the culture and ecosystem and Huawei is a great example of that. The great thing is that it has a huge representation from Pakistan;



in the country, about 80% of the employees are local (from Pakistan) and in Huawei Middle East, about 40% employees are from Pakistan. This is also shows the kind of reliance Huawei has on the human resource from Pakistan that speaks volumes about the talent in the country.

KA: How has Huawei, in specific, contributed towards the development of the educational sector in Pakistan?

FC: Huawei plays a very important role I would say by bringing in a corporate culture in the field of telecommunication and modernizing the tech space. We are now in discussions about training the human resource available. In Pakistan, we have about 40,000 engineers (electrical and computer) coming into the market every year but the ratio of employability is very low. And the major reason is absence of industry and certifications. I am looking forward to build at least 25 institutes in Pakistan, which can actually train our certified engineers and enable them to get jobs in the international market.

Huawei has built a centre where they have trained, I believe, around 1200 people for the telecom and tech industry. As I said, there is still room for more. Which

"I would very much like to have Pakistani companies exhibit here in GITEX so that our talents and capabilities can be demonstrated to the world on this and other platforms in the future."

is why I want Huawei to partner with us through which we can actually come up with a specific program to enhance the ability of Pakistani engineers to work in a multinational environment.

KA: Would you like to talk to us about some of the e-govt projects that are being implemented in Pakistan? Is a Huawei

playing a critical role in any of those projects?

FC: Huawei is playing a critical role in many projects. The most important, I believe is the digitalization of the Parliament. Huawei is working on that as well as important projects related to the safe cities, for which they worked with the administration in Lahore and Islamabad. And now, I think in the future, we are going to be taking steps further from safe cities and we will obviously move towards smart cities and Huawei will be an important partner for these projects. We have a solid long-term roadmap and we will work together with our partners to execute these.

KA: Do you plan to bring and support more Pakistani companies and govt entities for participating in GITEX next year?

FC: Absolutely – 100%. I will actually look into Pakistan's overall participation in the past year and understand what changes can we make to our plans to ensure we have a solid participation here.

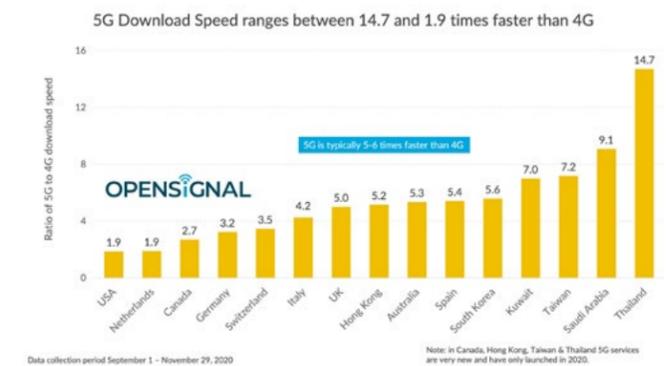
I would very much like to have Pakistani companies exhibit here so that our talents and capabilities can be demonstrated to the world on this and other platforms in the future. I will definitely work with my team towards making that happen. **T**

Benchmarking the global 5G user experience

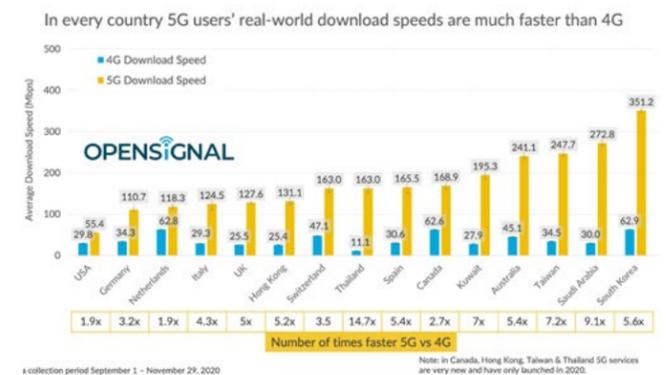
Ian Fogg

Opensignal has previously analyzed the real-world 5G experience of our users across mobile operators in a number of countries globally, including Australia, the U.S., Taiwan and South Korea.

Now, we are publishing a new look at the 5G experience across 15 leading 5G markets. In every country, 5G users see average download speeds many times faster than 4G. The improvement in 5G speeds ranges from 14.7 times faster than 4G in Thailand to 1.9 times faster in the U.S. Across most of these countries, users see 5G download speeds that are 5 to 6 times faster than 4G.



Our users in South Korea see the fastest average download speeds using 5G technologies with an average speed of 351.2 Mbps, which is slightly faster than the 272.8 Mbps seen in Saudi Arabia. In all but one country, our users see average 5G download speeds over 100 Mbps. Speed is by no means the only 5G measure that matters — how long users spend connected to the much faster 5G technology is also extremely important. Often, our users spend more time connected to 5G networks in those countries where we record slower 5G speeds.

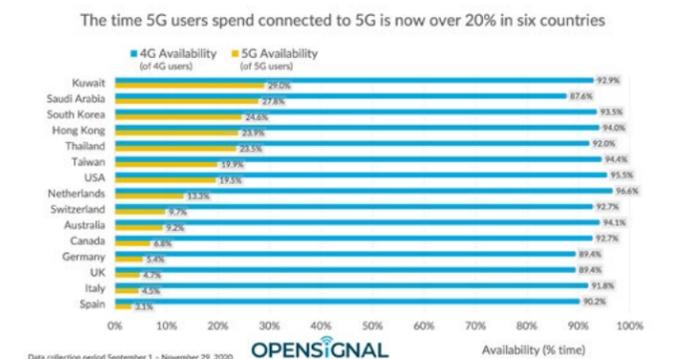


The modest 5G Download Speeds in the U.S. are due to the combination of a limited amount of new mid-band 5G spectrum available now and the widespread use of low-band spectrum by operators. For example,

T-Mobile's 600MHz and AT&T's 850MHz offer excellent availability and reach but lower average speeds than the 3.5GHz mid-band spectrum used as the main 5G band in every country outside of the U.S. However, in our last U.S. report we found that Verizon's mmWave-based 5G service offers a very considerably faster average 5G Download Speeds of 494.7 Mbps, which is faster than the average 5G download speeds Opensignal has seen on any operator, or in any country to date, including Saudi Arabia.

The amount of time users spend connected to 5G — or 5G Availability — is an important factor in the overall experience 5G users enjoy. We are still in the early stages of a 5G era that will last for at least a decade because the first 5G services launched only in 2019, and in a number of countries we continue to see 5G mobile services launching for the first time.

Despite this immature 5G market, Opensignal's data now shows that our users in five countries enjoy an active 5G connection for more than one fifth of the time. We see U.S. 5G users connect 19.5% of the time to 5G, placing the U.S. in the seventh place for 5G Availability, only just behind Taiwan and ahead of all seven European countries we analyzed.



The U.S. is much higher ranked on 5G Availability than on average download speed because low-band spectrum is ideally suited to enable greater 5G reach and allow users to spend more time connected than in countries where higher frequency 5G spectrum is commonly used. In the U.S. the low-band 5G services of T-Mobile and AT&T have helped drive a high 5G Availability result. T-Mobile U.S.'s very recent launch of standalone access 5G — where a phone no longer needs to connect to 4G in order for 5G to work — should help boost 5G Availability and network responsiveness in future.

Clearly, smaller geographies like Kuwait or Hong Kong have an advantage over large countries like Australia, Canada or the U.S. in offering users high levels of 5G Availability which makes the achievements of operators in Australia, Canada and the U.S. — powering their 5G users' experience ahead of Germany, Italy, Spain and the U.K. — all the more impressive. **T**

Source: OpenSignal



Interview: Gulraiz khalid

"We really treasure the reputation we've earned over 27+ years of successful projects"

Dmitry Okorokov, CEO, Infinet Wireless

Teletimes International met with the Infinet Wireless team at GITEK 2020 in Dubai. Despite the pandemic, Infinet Wireless continued to expand its geographical reach and presence. The introduction of new Point-to-Point solutions, opening up a new regional sales office in the USA, as well as set up a new training facility in Yaoundé, in the Republic of Cameroon and relocating its headquarters to Amsterdam (The Netherlands) have only been a few of the major initiatives of Infinet this year which definitely make it one of the most 'active' companies around at this time. Teletimes interviewed the CEO Dmitry Okorokov, the CTO Andrey Koynov, and the Marketing Director Ekaterina Safronova to get insights on Infinet's activities and a market brief from Infinet's point of view.

Teletimes: How would you comment on the communications sector and how it has evolved over the past few years (especially in the Middle East)?

Dmitry Okorokov: This year has been a little strange in the sense that you can easily differentiate it from previous years; because what happened has not been witnessed before (at least in the last few decades). The trends have been more or less the same across the globe, varying a little bit based on who got hit more or less.

In the Middle East and certain other markets, we have seen an uptake in projects related to connectivity. What people have realized is that although they have good connectivity before, it's not probably enough for certain things and situations.

Right now, everything is about remote - remote education, remote health, and you know, whatever you can do remotely you prefer to do remote. This has sparked an uptake in the business in the region in general, in certain countries, like, for example, UAE, Oman, Pakistan, as well as some other markets. In other markets such as Kuwait, for example, or Saudi Arabia, which used to be the biggest market for Infinet in the Middle East previously, because of the oil prices and

everything, there are tons of different projects going on here. But somehow all these projects still relate to oil budgets, even if we're talking about the private sector, the private sector is usually dealing with the government sector.

I foresee that in the government sector, specifically next year will be challenging. Again, on the one hand, there's a huge demand. But on the other hand, everybody will try to save, and limit cash outflows. So, we'll see because connectivity is such a strong demand for human beings just like sleeping and eating. Connectivity likewise is very close to that. Therefore, as far as the government spending is concerned, I still hope that it will continue because it's one of the primary needs these days and as such, they will still dedicate budgets for this. This is our hope because we know the projects and the demand is already there.

Teletimes: There has been a great shift in terms of how connectivity is being used, how business is being done and a greater pressure on network delivery. How has your experience been through this shift?

Dmitry: The shift is definitely there but that said, people will not stay in homes forever; so we have to know that this is temporary. The good thing however is that, now we are

much more prepared for such a situation, if it occurs in the future. There are other aspects as well, which we have realized only now. We have realized there is "only so much" that people can do by sitting at home, whilst some other people can do "so very much" by sitting at home. In the beginning of the pandemic, I myself was very worried that we will need to put everyone back home, especially the R&D guys, but soon we had such an effective system that everything is working well. In fact, for some people, we maybe considering that they continue to work from home because they simply work better. Everybody has their own working habits, their own comfort levels, some people are even better working at night. Therefore, equipping the home with the ability to work has been a great benefit in many ways.

This did come with a growing demand for cloud, and a pressure on network delivery which means everything needs to be interconnected at greater speeds with more availability and more reliable connections.

Teletimes: What will be the key focus for Infinet Wireless and its growth in the coming years?

Dmitry: From a geographical point of view, Middle East and Africa for sure will be the top focus. Shortly followed by Latin America. I

would say that these three regions are the top focus. From a market point of view, we have always been strong in traditional vertical markets, such as telecom market, and the Wi Fi space which will remain as the dominant market for many years to come.

We are seeing year on year, in our growth as a company at the same time, that the chunk of this vertical telecom services market gets smaller than other applications, which fill in that space, like oil and gas, public safety and projects related to remote education as of this year for us. We've been seeing so much of remote education actually, just so much of that already. And this is just the beginning. So I think that two or three years to come, projects like that will continue to fuel growth.

Teletimes: Infinet Wireless has built a great reputation for its quality? Would you like to share the factors behind this reputation?

Dmitry: What we're really proud of as a company is that everything we do, we do it in-house and we control everything. Starting from all the boards, DC enclosures; we design everything ourselves, including software, of course. But more than that, what we care about is the quality of the product, and not just quality as an abstract word, but actual quality and resilience because we know that our customers are so "creative" in how they use our equipment which can be very extreme conditions.

For example, in one extreme, we have the very north of Russia, where the equipment is being used in open pit mining, in temperatures of below -55, with extreme winds and huge vibrations. Whereas on the other hand, you take Africa, some possibilities where you have extreme heat, humidity, and everything is next to the sea so you also have a lot of salt in the area.

We put great effort in our R&D, and our testing. We imitate harsh conditions, the temperature, the salt, the vibrations and different combinations of extreme situations which results in the necessary durability and resilience that lead to "quality". This is how the reputation of a company is built - one can put whatever you want on datasheets but only after years to come is the real reputation built which is based on the word of mouth coming from personal experiences. We really treasure that reputation we've earned throughout almost three decades actually. It's been 27+ years we've been working.



"The shift is definitely there but that said, people will not stay in homes forever; so we have to know that this is temporary."

Andrey Koynov, CTO

Teletimes: Can you please tell us a little about Quanta 5?

Andrey Koynov: Quanta 5 is one of the latest products in our Point-to-Point portfolio, it's based on a technology platform called Octopus SDR which is one of our major recent developments. We have a number of products based on that Software Defined Radio platform, which is now truly the cutting-edge wireless technology.

Octopus SDR is intended to solve a spectrum deficiency problem, to resist hardest interference conditions and to meet the growing performance requirements. Quanta 5 is based on that platform, sharing it with a number of other products, such as Quanta 6, including some other products, still being developed or evolved, such as Quanta 70.

Teletimes: What makes the "Quanta" products from Infinet Wireless special?

Andrey: Quanta 5 is a record-breaking spectral efficient 5 GHz Point-to-Point solution, which has already been deployed in a diverse range of applications. It also has a record of being used over a long distance, from backhauling Wi-Fi and 4G/LTE base stations to video-surveillance and mission critical requirements. It meets higher-than-expected demand for reliable and high-capacity Internet access for both urban and rural locations.

On the other hand, the new Quanta 70 solution marks a new era for Infinet Wireless, as it is aimed at deployments in the 71-76 GHz frequency band. Its usage brings many opportunities in this band which is unlicensed in most countries of the world. The potential of this new product family to provide reliable connectivity even over a long distance was clearly demonstrated during test with one of our valued customers who achieved a 22 Mbps throughput over a distance of 51 km between the two Moscow region towns of Klin and Dubna.

Teletimes: What products are you highlighting at GITEX Technology Week, especially for telcos?

Andrey: We are showcasing at GITEX, the latest generation of our Point-to-Multipoint solution which raises the bar in



"For the existing networks, this incremental evolution allows to gradually upgrade those networks without interrupting the service and many of our customers are thrilled by this perspective and are planning to upgrade their networks."

terms of spectral efficiency, but at the same time for the existing customers and their existing networks provides a smooth and economical migration path.

The infiMAN Evolution is a wireless Point-to-Multipoint solution operating in 4.9 - 6.4 GHz frequency bands. Built-in network firewall blocks suspicious traffic and ensures secure connectivity. For optimal integration into existing networks infiMAN Evolution supports numerous network protocols including dynamic routing OSPF

and RIP, network address translation NAT and Q-in-Q Vlans. To provide high-quality services for customers there are tools for smart traffic prioritization and shaping.

So, for the existing networks, this incremental evolution allows to gradually upgrade those networks without interrupting the service. Many of our customers are thrilled by this perspective and are planning to upgrade their networks and subsequently boost the performance of them by smoothly migrating through the infiMAN Evolution.

Ekaterina Safronova, Marketing Director

Teletimes: What are your plans for GITEX this year?

Ekaterina Safronova: First of all, we are very pleased to be exhibiting at GITEX Technology Week 2020. Being a key player in the fixed broadband wireless arena in the Middle East, we have the opportunity to present our leading-edge technologies and solutions. Our plan for this year, just like for previous ones, is to showcase our most recent additions to the portfolio, networking with industry experts and users from all over the world, and ultimately increase significantly our brand awareness in the Middle East.

"We keep growing, and even during this time, we are able to show what we have done already, and more importantly, we want to highlight that we adapt, we do not stop."

Teletimes: During the pandemic, many vendors refused showcasing at GITEX Technology Week 2020 but Infinet Wireless decided to do it nevertheless. Was it reasonable in this tough time, and what are the benefits for Infinet Wireless?

Ekaterina: Every year, we take part in many different events. This year is of course totally different, but because of this, it's even more useful for us to be here. It's extremely important to show everyone we work hard to offer more cutting-edge solutions to our



partners and customers. We keep growing, and even during this time, we are able to show what we have done already, and more importantly, we want to highlight that we adapt, we do not stop.

Teletimes: How important is GITEX Technology Week for your company?

Ekaterina: GITEX is without any doubt one

of the major industry events in the region. Taking part in it, along with some of the world's top operators and integrators, is something we couldn't afford to miss. Not only will we be able to establish many new contacts, but also learn about market trends and plans for our target market sector. And of course, this event also helps us increase our brand awareness in the Middle East. **IT**

Smart Dubai celebrates 5 Years of Accomplishments and Successes



Younus Al Nasser

Smart Dubai gears up to celebrate the fifth anniversary of its establishment, looking back at a series of achievements it has made along its journey to establish Dubai into the smartest and happiest city in the world.

Guided by the forward-thinking vision of the emirate's wise leadership, Smart Dubai made great strides towards digitizing the Dubai Government, launching a set of innovative initiatives to embrace emerging technologies, and use them to develop advanced services that improve people's lives and establish Dubai as a world-leading smart city.

HE Younus Al Nasser, Assistant Director General of Smart Dubai, CEO of the

Dubai Data Establishment, said: "Smart Dubai is the government entity that was established to spearhead the emirate's digital transformation. And today, we celebrate five years of unparalleled successes and accomplishments, guided by the forward-thinking vision and close supervision of our wise leadership, who have long championed digitization as the way forward and the path towards future leadership. We have always believed, as our leadership does, that technology is there to be used for our benefit, to enhance government procedures, boost private-sector performance, and promote happiness in the community."

For his part, H.E. Wesam Lootah, CEO of the

Smart Dubai Government Establishment, said: "Perhaps the truest test for the utility of Dubai's digital transformation came about this year with the global COVID-19 pandemic, which brought unprecedented challenges for cities around the world, slowing down economic activity across every sector – including government. Dubai's advanced digital infrastructure allowed the emirate to provide efficient and innovative services, ensuring business continuity and uninterrupted government processes, at a time when cities around the world saw businesses shutting down and faced difficulties in providing services to their communities."

Effective Strategies

Smart Dubai has launched a series of innovative strategies since its foundation, which helped drive the emirate's digital transformation, establishing a robust digital infrastructure capable of streamlining government procedures and ensuring customer happiness. The Dubai Paperless Strategy is among the most notable of these initiatives; it was launched to digitize internal and external government transactions, rendering them completely paper-free.

The Strategy was rolled out in collaboration with Smart Dubai's government partners over several phases, covering a total of 42 Dubai Government entities. The Strategy has so far led to savings of more than AED 725 million, 7.7 million hours of labor, and 20,350 trees that would have otherwise been used to produce paper.

Furthermore, Smart Dubai registered great progress with its Dubai Blockchain Strategy, where it has unveiled a series of Blockchain-powered initiatives and services in several sectors.

Seamless Smart Services

Smart Dubai launched DubaiNow to be the central app for all smart city services, providing users with access to more than 120 government and private sector services from over 30 entities. The city services on



Wesam Lootah

DubaiNow can be classified into 12 different categories, namely: Bills, Mobile, Driving, Housing, Residency, Health, Education, Police, Travel, Islam, Donations and General.

Since its official launch, the DubaiNow application has processed 11.47 million transactions, valued at more than AED 6.03 billion.

Furthermore, Smart Dubai launched UAE PASS as a joint initiative with the Telecommunications Regulatory Authority (TRA) and the Abu Dhabi Digital Authority (ADDA).

Data Wealth

Dubai's data journey started with Dubai Data Law in 2015, which made Dubai the first city to mandate the sharing, use and reuse of data. Today, Smart Dubai is leading the world's most ambitious and comprehensive data initiative in the world. It supports Data Champions in various government entities – a community of public-sector change agents

leading the implementation of Dubai Data initiatives within their entities and ensuring organizational compliance with the Dubai Data Law.

Smart Dubai has also established the Data Science Lab to develop data science skills in the emirate and foster collaboration among Dubai's data science community to identify and explore use cases that will help deliver insights, foster the growth of a data ecosystem, and ensure economic and social benefits.

On the same note, Smart Dubai launched the Dubai Pulse platform – the digital backbone of Dubai – which has so far ingested more than 637 datasets on Dubai Pulse, 246 of which are open datasets and 391 are shared datasets.

Promoting Happiness

Smart Dubai launched the 'Happiness Champions' initiative, where members of more than 40 government, semi-

governmental entities were tasked with implementing the Happiness Agenda and launching new initiatives and projects. Over the course of five years, the initiative organized four international training workshops for Happiness Champions to help enhance service and city design efforts. In 2020, Smart Dubai launched the Digital Service Design Professional Diploma, offered exclusively to Smart City Experience Specialists as part of the new phase of the Happiness Agenda.

Artificial Intelligence Solutions

In 2017, Smart Dubai launched the Artificial Intelligence (AI) Lab in collaboration with several government entities to identify and develop use cases for AI implementation across all industry sectors. The programme ran 20 workshops, identified over 100 possible use cases of AI development within the Dubai government.

Smart Dubai also developed the Ethical AI Toolkit to set clear guidelines on the ethical use of the technology, and prevent having a fragmented, incoherent approach to ethics, where every entity sets its own rules.

Local and International Impact

In an effort to strengthen its partnerships, expedite the emirate's digital transformation, and fulfil Dubai's smart-city aspirations, Smart Dubai signed a total of 191 agreements in the 2015-2020 period with various local and federal government entities, as well as prominent private companies, including SAP, Dell, du, Careem, IBM, and Network International.

Smart Dubai also formed the Smart Cities Global Network (SCGN) – the first network of its kind – in a bid to place Dubai on the global map in thought leadership on smart cities.

Promising Projects

This year alone, Smart Dubai launched a series of initiatives and projects, such as the '100% Digital Stamp' initiative, to recognize and award entities that have fully implemented the Dubai Paperless Strategy, becoming 100% digital.

Moreover, Smart Dubai launched the data-powered 'Dubai Registers' initiative to build a network of accurate, reliable, and interconnected data records for a sustainable and happy city. **1**



Etisalat presents a Digital Future & Beyond at GITEX 2020

Convergence of 5G, AI, Big Data and IoT at the global technology show

Demos making their presence for the first time globally in transport, retail, healthcare, education, fashion & entertainment

Etisalat successfully concluded its participation at GITEX Technology Week 2020 – the region’s only face-to-face technology event of the year - which saw the convergence of 5G, AI, big data and IoT - under the theme ‘Empowering the Digital Future and Beyond’.

Visitors experienced the future of mobility, retail, healthcare and use of technologies such as robotics, AI, virtual reality, analytics across these verticals with a profound and positive impact on the different segments of the society.

The event also witnessed several strategic partnerships of Etisalat with world-famous industry names and

Teletimes Report



government entities, and the launch of EtisalatAtGitex Live, a virtual channel which enabled tech enthusiasts to explore all the digital innovations on the stand, hear from Etisalat experts and get first-hand experience of the technologies reshaping key industries.

Making their debut on Etisalat’s stand this year were demonstrations on transport, retail, healthcare, education, fashion and entertainment. In ‘Future Transport’, Etisalat took visitors on a journey and the possibilities of the future mobility with 5G connectivity in commercial and regional as well as inter-regional aerial transport. The all-electric, highly automated and fully connected BMW Vision iNEXT, and BMW Vision DC Roadster, a futuristic electric motorcycle a major step into the full-size electric two-wheel segment, were an instant hit.

Certified showstoppers were the taxi SA-1, an electric flying taxi developed by Hyundai with Uber; AirCar, an autonomous all-electric human carrying flying car; the world’s fastest autonomous delivery drone by German drone maker Wingcopter; Rinspeed’s MetroSnap, an innovative autonomous driving concept; and the Park Rover, an autonomous pod designed to be part of a complete mobility system ecosystem integrated with a mobile app and a cloud service.

Healthcare and assistive technologies on the stand provided insights into how technology can transform this sector with cloud, IoT, M2M, AI, blockchain and state-of-the-art connectivity including 5G, with innovative and cutting-edge healthcare solutions from all around the globe.

‘Technology for Good’ demonstrations featuring transformative technologies included a self-driving electric wheelchair; the world’s first medically approved 3D-printed prosthetic arm called Hero Arm; and NuEyes E2, a removable visual prosthetic that helps the visually impaired see again while keeping their hands free. Other showcases included the Sound Shirt that allows the deaf to “feel” music on their skin; frictionless retail solutions for the smart pharmacy store; and 3D medically approved technologies.

Just like previous years, Etisalat brought the best in the world of robotics to its stand. Humanoids Adran and Jen spoke and interacted with visitors, while innovative robots from MELTIN – MELTIN Arm and MELTIN-Z performed power-varied actions.

Etisalat’s stand also featured advanced



solutions and services to support education during COVID times such as a demo-tutoring platform, an AI-based access control and students' attendance system, an AI-powered solution measures and tracks students' attention, focus and mental performance. Two industry-related COVID-19 solutions on display were the Connected Jobsite using wearables and AR-VR powered-solutions for predictive maintenance and remote operations.

Dr Ahmed Bin Ali, Group Senior Vice President at Etisalat, who took the media on a tour of Etisalat's stand, said: "Etisalat's presence at GITEX this year signifies the increasing relevance technology and modern telecommunication services play in our lives and especially during the pandemic. All the solutions present on the Etisalat stand provides visitors an insight on the positive impact futuristic technologies will have in business, entertainment, education and all segments of the society. The focus this year will continue to be bringing together disruptive technology solutions from across verticals aimed to empower every segment of the society."

This year at GITEX, Etisalat is introducing new mobility segments along with 5G connectivity in commercial and regional as well as inter-regional aerial transport. This in line with Etisalat's continuous efforts to boost the Dubai Government's strategy to raise the share of autonomous transport to as much as 25 percent of the total transportation in the emirate by 2030.

Saeed Al Zarouni, Senior Vice President, Mobile Network, Etisalat, said: "5G stands out as a game changer with rich potential, an evolution that would elevate services, performance, and enablement. It is in line with UAE's digital vision, market trends and Etisalat's long-term strategy of 'Driving the digital future to empower societies'. At this year's GITEX, 5G continues to take center stage at Etisalat's stand as we present connected and autonomous vehicles reflecting the shifting mobility preferences that appear to be reshaping the future of mobility."

Abdulla Ebrahim Al Ahmed, Senior Vice President, Government Sales, Etisalat, said: "During this unprecedented period that has challenged both health and the economy, Etisalat has taken many steps to ensure that its network, services and teams are well equipped to support its customers. At this year's GITEX, Etisalat is demonstrating a wide range of advanced solutions for enhanced distance learning and remote working in line with its strategy of 'Driving the digital future to empower societies'."



Etisalat has achieved the world's fastest 5G download speed of 9.1 Gigabits per second.

The throughput has been achieved by aggregating multiple commercial spectrum band of n78(3.5GHz), n41(2.6GHz) and millimetre wave n258(26 GHz). This was accomplished through a prototype 5G device that aggregates all three bands.

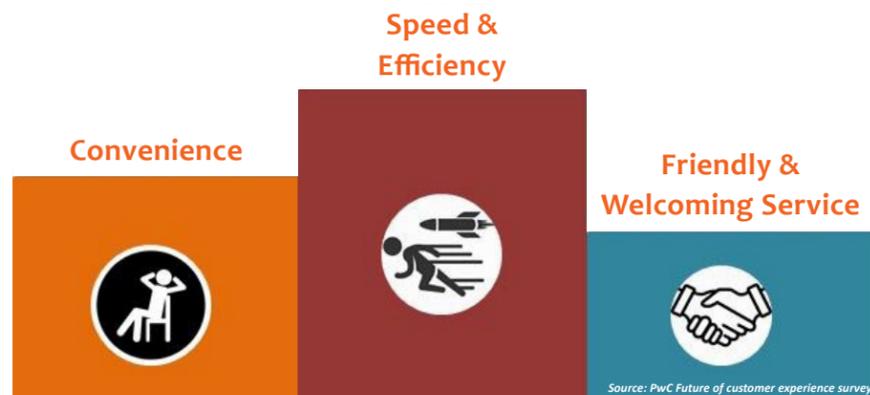
Saeed Al Zarouni, Senior Vice President, Mobile Network, Etisalat, said: "Today's landmark announcement is a result of Etisalat's efforts in building a robust 5G network, and 9.1 Gbps is truly a huge leap forward in the 5G era to offer a speed 30 times faster than a 4G average throughput. This will have a significant and profound change on individuals, industries, society and the economy, transforming how we live and work."

At its GITEX stand, Etisalat is showcasing the all-electric, highly automated and fully connected BMW Vision iNEXT, and BMW Vision DC Roadster, a futuristic electric motorcycle and major step into the full-size electric two-wheel segment. Etisalat has also partnered with BMW to provide the eSIM platform, connecting wirelessly with ConnectedDrive vehicles, providing customers an enhanced driving experience.

Taking off from Etisalat's stand is the taxi SA-1, an electric flying taxi developed by Hyundai with Uber. This fully electric car flies a distance up to 60 miles at an altitude of 1,000 to 2,000 feet. **T**

Customer Experience in Digital Transformation Era

Mansour Al Dalaan
CEO of Contact Center Company (CCC), KSA



Importance of Customer Experience for Business Growth

Amid intensifying competition, saturated markets, and volatile economic conditions; customer experience (CX) has emerged as a key competitive advantage and business differentiator for enterprises. There is no doubt in the fact that enterprises delivering high quality CX are able to – drive brand loyalty, reduce customer churn, encourage brand advocacy, and hence boost revenue. Also, customer expectations and needs evolve continuously, and when offered with a negative experience, they tend to change the course and loyalty for a brand immediately. The fact that –the cost of retaining customers is comparatively less than that of acquiring new customers, points out the implication of positive CX on customer retention and business growth. Both consumers as well as enterprise customers expect a high degree of customer experience delivery, irrespective of the industry they operate in. The fundamental

expectations of customers in terms of convenience, speed & efficiency, and friendly & welcoming service are the basic aspects that drive existing as well as new customers to pay more. Experience is everything in today's world!

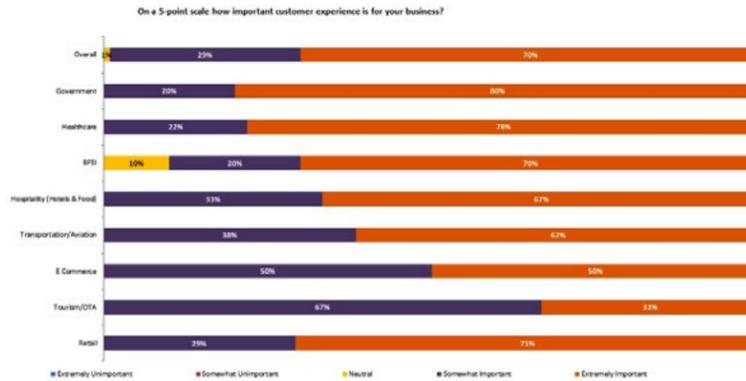
Few Interesting Statistics from Recent CX Surveys

- 44% of companies believe improving customer experience and satisfaction is the most important business goal followed by improving operational efficiencies (41% of companies) for the next two years, apart from revenue growth.
- Attracting a new customer is 7X more expensive than retaining a current one.
- 49% of customers have made impulse purchases after receiving more personalized experience.
- Customers are willing to pay a premium of up to 13% by receiving a great customer experience.
- 72% of customers will share a positive experience with 6 or more people.
- If a customer is not happy, 13% of customers will share their experience with 15 or more people.

Digital Transformation is the key Element in CX Delivery – KSA Perspective

Saudi Arabia, one of the largest countries in the MENA region has a young and highly vibrant population. Almost 80% of the Saudi Arabian population is between 18 – 34 years of age group, while 44% is between 25 – 34 years of age. The Kingdom is bolstering of a young and highly tech savvy population with strong presence on social platforms. The Kingdom has over 90% of its population as active internet users, and over 80% of mobile internet usage penetration, which is second to none in the world. The country has one of the highest social media penetrations levels in the world, supported by its high smartphones ownership and internet user penetration levels.

As a matter of fact, ~70% of the population is active social media user; Saudi Arabia ranks #1 in Twitter penetration; 72% of the population is an active WhatsApp user. With favorable demographics of large young, urban, and tech-savvy population, KSA is a marketplace for early technology adopters and also a potential global hub for technological innovation. Also, Saudi Arabian telecom operators were among



Source: Frost & Sullivan's Saudi Arabia CX Survey, 2020

the first few countries to launch commercial 5G services in the Middle East region; and as we speak, there are a plethora of 5G use cases that are being commercially deployed in the Kingdom.

The highly ambitious Vision 2030 initiative, Kingdom of Saudi Arabia (KSA) has been implementing several economic and social reforms mainly aiming to reduce the country's dependence on the oil sector. Since the launch of the initiative, KSA has made remarkable progress by ramping up privatization efforts and improving the country's business environment and competitiveness. One of the focus areas of the initiative is to develop a digitally-driven economy by facilitating widespread adoption of emerging technologies across organizations of all sizes and industry verticals.

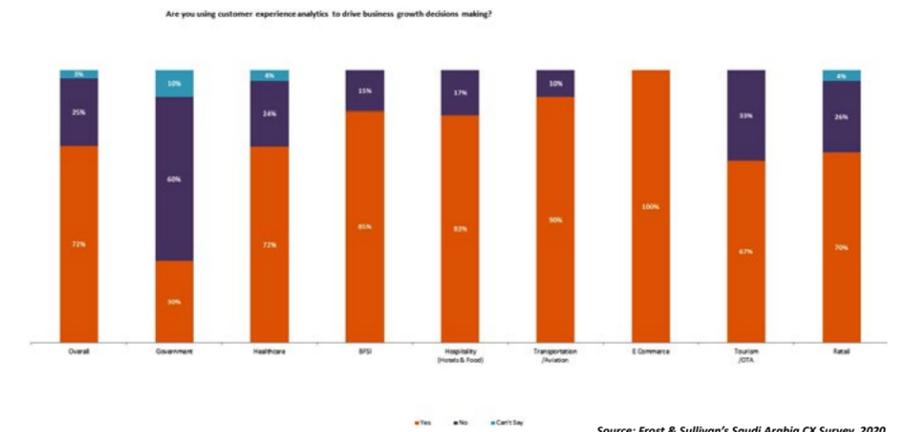
With enhanced digitalization, enterprises no longer offer just goods and services but focuses on offering an experience to customers. While, experience has been the heart of some industries like sports and entertainment, the value of experience have also paved its way to other sectors like retail, banking, and more. This resulted to the emergence of experience economy, which is perceived as the fourth economic offering along with goods, commodities, and services. While digital transformation could have different meaning for different enterprises; in light of CX, it often means Omni-channel presence, multiple touchpoints, and holistic view of customer journey.

Relevance of CX and Omni-Channel Strategy

Consumers no longer rely only on traditional customer engagement channels like calling to contact centers. Consumers now are more self-sufficient, and increasingly prefer

engaging with brands across a widening array of digital channels like email, social media, apps, web chat, and others.

Omni-channel approach represents the next phase of CX evolution with service providers increasingly looking to offer intuitive, intelligent, and seamless experience across all touch-points. In order to maintain a uniform experience across all channels, context based interaction with customers is the key. As technologies and tools empowering Omni-channel service delivery becomes more advanced and mainstream; opportunities are emerging for CX service providers for offering a more personalized service to customers.



Source: Frost & Sullivan's Saudi Arabia CX Survey, 2020

Next Generation CX Capabilities

Digital transformation with targeted technology investment is pivotal for developing an effective end user CX. Next generation technologies like big data analytics, internet of things (IoT), artificial intelligence (AI), and machine learning (ML) is facilitating the development of advanced

Case Studies

— A leading telecom operator implemented an AI powered chatbot for providing its customers with conversational experience through voice, web, and also mobile app. It is capable of addressing both basic as well as more complicated customer queries without human interaction. With the implementation

of the chatbot, the company was able to automate **66%** of customer contacts, reduce the frequency of customer contacts per customer by **-15%** year-on-year, and also improve the net promoter scores (NPS). Also with improved automation, the customer operations cost was minimized by **-19%** year-on-year.

— Another telecom company automated several inefficient processes aiming to streamline operations and also improving the time-to-market of new services. The company implemented several RPA bots for automating manual processes. Following the implementation, the company reported a significant savings of around **USD 110 Million** annually from its customer services business unit.

"CCC has been adopting myriads of new digital capabilities, which helped it gain competitive edge and successfully streamlining customer service and marketing operation for its clients, while cutting down cost."

CCC leading the way in CX management

Headquartered in Riyadh, Saudi Arabia, CCC is a joint-venture between Saudi Telecom Company (stc), the state-owned leading telecom firm, and Startek, a global customer experience management company, based out of the U.S. Since its inception in 2011, CCC has been successful in consolidating its position as a leading CX management company, serving customers not only in the Middle East region, but across the globe. Over the years, CCC has gained strong domain capabilities across multiple industry verticals including telecom, government, retail, technology, banking and financial services, healthcare, travel and hospitality, and e-commerce. The company differentiates itself from competitors through its technology and solutions expertise, end-to-end service offerings, and flexible engagement models. The company serves enterprises of all sizes and is also a trusted partner for several government organizations. The company has more than 5,000 strong workforces with around 1,500 female employees, capable of serving clients in 7 different languages.

CCC has been adopting myriads of new digital capabilities, which helped it gain competitive edge and successfully streamlining customer

service and marketing operation for its clients, while cutting down cost. The company has evolved as one stop solution provider, catering to all the evolving CX requirements of existing customers, while also attracting new leads. The company's comprehensive portfolio of digital capabilities includes and is not limited to **social media management, digital marketing, conversational analytics, and chatbots**. The impacts of these tools in the business are incredibly compelling for clients. These services have been benefiting clients in centralizing all their social media efforts, improving engagement, better analyze market and customer sentiments, automating interactions, while reducing cost, and delivering quick and round the clock support. CCC also incorporated advanced tools like **speech analytics** which significantly

improved productivity by helping in identifying the root cause around high average handle time (AHT) at process as well as group level. By lessening the AHT, it also optimized operations & support manpower required and thus reduced the overall cost. Empowering its workforce, CCC incorporated **workforce optimization tools** along with **productivity and efficiency management systems** like **voice blast for shift adherence, HR and personal management, and automatic scheduling**. Moreover, strengthening its cyber security, CCC integrated **SIEM solutions, email security, and managed SOC solution**. In addition, CCC is in the process of implementing **RPA, intelligent routing, remote desktop and big data** to further improve the customer experience and business effectivity. Also, the company is also looking to configure Omni-channel solutions like **virtual customer support and virtual agent**.

Shifts in Customer Engagement Channels Amid COVID-19

While behavior and expectation of customers were already evolving, the ongoing COVID-19 pandemic has proved to be a catalyst for further change. User behavior towards service consumption has shifted dramatically towards

digital channels during the ongoing pandemic. CX service providers have faced challenge in setting up remote working environment, working practices, and adjusting KPIs. While, typical voice based service delivery are most impacted during the pandemic, the reduced service levels from regular engagement channels have driven consumers to shift to digital self-service.

CCC has been successful in moving more than **95%** of their workforce to work remotely without disrupting the service delivery during the pandemic. CCC's digital-first resilient model and adoption of **cloud, VPN, online attendance system, and virtual meeting/interview** solutions facilitated the smooth transition to working from home setup. The company accessed the situation quickly and effectively transitioned new hiring, on-boarding, and employee training programs into a virtual format. Moreover, it also supported the government by working with NIC in the fight against COVID-19.

Conclusion

Customers have more power than ever before. One sub-standard experience can result in social media outrage, effecting public perception, share value, customer trust, and more. For sustainable development of any business, delivering appropriate CX has become very critical. Along with improving CX, enterprises are also focusing on boosting margins, shortening time to market, reducing risk, and further driving business outcomes. To outshine competitors, CX services providers need to demonstrate their capabilities and values like domain expertise, security infrastructure, and best practices as well as strengthen digital capabilities by leveraging advanced technologies like RPAs, chatbots, and virtual assistants.

Despite several COVID-led challenges, CX service providers have a unique opportunity to capitalize on the ongoing changes by driving greater customer engagement through digital channels, while meeting increased demand and controlling costs. In addition to dealing with the current situation, it is important for CX service providers to mitigate future risks. Assessing the performance of channel mix and evolving those channel capabilities that drives most benefit should be very critical in the future. Also, it will be important to service providers to adapt their operating model and drive more flexibility in operation as well as geographical redundancy. ■



stc to expand its data center portfolio in KSA

In presence of HRH Prince Mohammed bin Khaled Abdulla Al-Faisal, stc has announced launching 3 Mega Data Centers in KSA, with SAR 1 billion investment. They aim to host telecommunications equipment and digital cloud infrastructure, offering higher availability, more flexibility and faster time to the customer. stc adopted Next Generation build technology through modular and prefabricated solutions, affirming business continuity and service uptime. It also enables stc to optimize future expansions with Grow-On-Demand technology and Quick-To-Market solutions.

The three new Data Centers have been built with over 150 prefabricated modules (PFM's), fully equipped with power, thermal management and IT infrastructure. Providing 10.8 MW of critical IT power (white space ready) expandable to 16.8 MW. Phase 2 of the program already in construction will bring the total Critical IT Power to 40.8 MW.

Furthermore, the short-term future will see stc expanding its mission-critical white space to more than 105 MW of Data Center IT power across the Kingdom utilizing the same highly resilient model. The new design of the Data Centers has received Tier III Certification for Design & Construction from the global authority "The Uptime Institute" and are fully compliant with local regulations.

These projects represent the first phase of its New Era "Next Generation" Data Centers. Phase 1 of this ambitious program is now complete, with new Data Centers in Jeddah and Madinah already online, and today sees stc's 3rd new Data Center being commissioned in Riyadh.



stc has embraced state-of-the-art design and construction techniques, which is set out to advance the Kingdom's infrastructure architecture. stc's vision is realized through the rapid deployment of multiple cutting-edge Data Centers specifically tailored to meet the ever-increasing requirements of this giant company. This exciting announcement comes as part of stc's ongoing achievements to enable digital transformation within the Kingdom and further the country's National Transformation Program 2020, in line with the Saudi Vision 2030.

Nasser Al-Nasser, stc Group CEO stated: "Recently we announced \$500 Million investment with Ali Baba Cloud and eWTP, and now we are investing about SAR 1 Billion in these 3 Data Centers. The successful completion and transformation of stc's mission-critical offering will enable the next step in digital services to be delivered throughout the Kingdom. This first milestone

achievement is only the beginning"

Haithem M. Alfaraj the stc Senior VP of Technology and Operations stated: "stc has reached a major milestone in providing next-generation Data Centers, that will meet the current demands for digital infrastructure, with the flexibility to grow and mature with the digital evolution"

stc's current network transformation and new Data Center program will fundamentally change the mission-critical hosting space within the region, improving the agility and speed-to-market of the new services being rolled out in support of the Kingdom's National Transformation Program 2020, and the Kingdom's 2030 vision. stc's successful achievement in this program has exceeded all expectations, and STC has already started Phase 2 of the program that will deliver an additional 4 new Data Centers in strategic locations throughout the Kingdom. ■

Nokia and stc launch the operation of Technology Innovation Center

Nokia and stc have announced a joint collaboration to operate stc's Technology Innovation Center in Riyadh. An agreement was signed to this extent by Abdullah Alowini, VP, Technology Strategy and Architecture at stc, and Khalid Hussain, Saudi Country Senior Officer at Nokia, in the presence of Haitham Al Faraj, SVP, Technology and Operations at stc, and Amr K. El Leithy, Head of Middle East and Africa Market at Nokia. The five-year project will see Nokia carry out several programs to help stc develop at least four truly innovative use cases every year to support stc's business goals.

Nokia will also support stc with the development of innovative use cases for new upcoming technologies. stc will also join Nokia's Open Ecosystem Network, a digital collaboration platform which brings companies together to help them innovate and develop new ideas. This is where the center's digital community will be hosted.

Communications Service Providers (CSP) worldwide are working towards developing an innovation mindset to create new use cases for next generation technologies such as 5G. STC has partnered with Nokia to achieve innovative use cases, utilizing Nokia's proven expertise in the latest technologies such as 5G, Mobile Edge Computing, Internet of Things (IoT), Cloud Platform, Augmented Reality (AR), Virtual Reality (VR), Artificial Intelligence (AI) and Machine Learning (ML).

Under the partnership, Nokia will also raise stc engineers' capabilities to develop an entrepreneurial mindset that will help them build use cases in line with unique requirements of Saudi Arabia. Nokia will conduct several competitions to stimulate new ideas and use cases. A winner will be selected at the end of every challenge, contest or hackathon, based on the concept or business viability. This will help STC develop new revenue generation streams.

Nokia will utilize its learnings and insights from several other partnerships worldwide



Under the partnership, Nokia will also raise stc engineers' capabilities to develop an entrepreneurial mindset that will help them build use cases in line with unique requirements of Saudi Arabia

to efficiently manage and operate the innovation center. In addition, Nokia will conduct several activities, including new product development practices, lean start-up methodologies, internal innovation enablers, service design, co-creation, cross-pollination, and technology scouting, to stimulate new ideas.

The innovation center will be equipped with the latest technologies and will leverage Nokia's Open Ecosystem Network. It will provide an opportunity for STC employees to interact and benefit from Nokia's

international partner network. The exchange of ideas and interaction with global subject matter experts will help develop innovative services and products.

Abdullah Alowini, VP, Technology Strategy and Architecture at stc, said: "We are committed to providing the latest products and services, and this is a crucial initiative in this direction. The innovation center will develop path-breaking use cases that will improve the lives of the people and contribute to the economic and social development of Saudi Arabia in line with Saudi Vision 2030. We are confident that this program, in collaboration with Nokia, will help us in developing local content and innovative use cases to improve the quality of lives of our people."

Khalid Hussain, Saudi Country Senior Officer at Nokia, said: "This collaboration is testimony to yet another strong, evolving partnership between stc and Nokia, contributing towards fast realization of Saudi Vision 2030. We are excited to work with stc on this unique initiative to develop unique ideas. We look forward to leveraging our global perspective, insights and technology expertise to help conceptualize new ideas to enhance the quality of life of the citizens." **T**

US ban on Huawei comes back to Economy and Geopolitics, not Cyber Security

Khalid Athar

The roll-out of next-generation 5G wireless networks can be a real game-changer and one in which some Middle Eastern countries are currently leading. But, to make this happen, openness, transparency, close collaboration, and providing fair opportunities to all is vital.

With 5G's expected significant influence and transformational capabilities, governments play a key role in improving the productivity, participation, and creativity of societies and businesses; and are thus well suited to dictate the application of digital-economy strategies by taking advantage of advanced technologies, 5G specifically.

In this context, one of the most significant issues in the world of digitization, technology and 5G, is the United States ban on Huawei technologies and solutions, and what that means for businesses and consumers in the Middle East and around the world.

As a private company, Huawei is a true representative of cutting-edge technology and innovation, reaching out to the world with advanced technologies and solutions, particularly in 5G, AI and computing. As the digital era evolves and the world's continuous need for new technologies regardless of its origin country, the blacklisting of Huawei by the US is an event of historic significance.

Since 2019, the US administration added Huawei to an "entity list" that barred many US companies from engaging with Huawei, and has since tried to pressure its allies to not engage Huawei on 5G network developments. The current US policies essentially limit Huawei from procuring necessary components for its 5G division, as well as its broader advanced technology portfolio.

The premise of these policies has always



been "national security", and that Huawei posed a security threat. However, it is becoming increasingly clear that the US administration's policies are less about security and more about Western dominance in emerging technologies like 5G.

The US is not doing enough to maintain American strength

The reality is that, for the first time in history, the US is not leading the next technological era.

Earlier this year, US Secretary of State Michael Pompeo went so far as to say that Europe "needs to get" Huawei "out of their system" as part of ensuring "that the next century remains a Western one." US Attorney General William Barr was quoted as saying that some private American businesses are actually the "problem" for not doing enough

to maintain American strength.

The reality is that, for the first time in history, the US is not leading the next technological era. This is happening by companies in China, and many other brands from the East. Technology—and particularly 5G networks—have become especially important in the context of COVID-19, with an ability to support huge surges in network traffic connecting people and machines more than ever before. While the US has no national company competing in 5G, it still has great power to enforce economic sanctions, which is what they are doing now until they can figure out how to catch up.

This is important for the Middle East as aggressive actions against 5G technology supply chains harm all economies. Today we are interdependent as a region and as a global society. We rely on each other and on

digital infrastructure to keep borders open, trade flowing, and to share knowledge.

Internet Society Statement

Following US Secretary of State Michael Pompeo's announcement on launching the "Clean Network" Program and the United States' efforts to remove Chinese companies from the internet in the US, the Internet Society Statement said.

"The Internet is a global network of networks, where networks interconnect on a voluntary basis with no central authority. It is this architecture that has made the Internet so successful. Today's announcement of the U.S. Clean Network program challenges this architecture at its very core.

SEMI

SEMI, the industry association serving the global electronics design and manufacturing supply chain, issued a statement as response to the new export control rule changes announcement by the United States Commerce Department which banned US companies, or any other company in the world to export equipment with US technologies to Chinese companies, particularly Huawei.

On July 14, 2020, in public comments on the May 15 regulations, SEMI cautioned that those relatively narrow actions created unique disincentives to purchase U.S.-origin semiconductor equipment and design software and had already resulted in \$17 million lost sales of U.S.-origin items to firms unrelated to Huawei.

Huawei 5G Passes GSMA's NESAS

In August 2020, Huawei's 5G wireless and core network equipment surprised the world by passing the GSMA's Network Equipment Security Assurance Scheme (NESAS), which is an implicit response to many of the allegations that the US administration made against Huawei about the security of 5G networks.

Cybersecurity assurance is a shared goal

For Huawei, cybersecurity assurance is a shared goal between Huawei, customers, supervisory authorities, and other stakeholders. Trust in cybersecurity has become a major global concern as the world

becomes more digital. Huawei believes that trust must be based on verifiable facts, which should in turn be based on shared standards.

We believe that this is an effective way to build trust in the digital era. Huawei supports GSMA and 3GPP in developing a global standardized security assessment, an idea that has largely been accepted as an industry consensus. NESAS promotes this concept, and as such, Huawei urges the industry to widely adopt NESAS.

US Eases Conditions

To protect the interest of American companies, the United States (U.S.) announced that it has eased earlier sanctions imposed on Huawei in mid-2020 which banned the company from using American technologies in 5G networks and semi-conductors. The Department of Commerce approved in a statement a new rule that allows U.S. companies to work with Huawei on setting standards for next generation 5G networks.

Experts believe that the U.S. government aims, through the new decision, to keep American companies capable of competing with Huawei, but its previous sanctions have unintentionally caused U.S. companies to lose their position in favor of Huawei.

Industry experts confirm that the decisions by the US government does not just affect Huawei. It will have a serious impact on a wide number of global industries. In the long run, this will damage the trust and collaboration within the global semiconductor industry which many industries depend on, increasing conflict and loss within these industries.

Statement on Foreign Direct Product Rule Changes

Huawei categorically opposed the amendments made by the US Department of Commerce to its foreign direct product rule that target Huawei specifically.

Huawei is undertaking a comprehensive examination of the new rule and expects that its business will inevitably be affected and it will try its best to seek a solution.

Global Patent Race

China was the biggest source of applications

for international patents in the world last year, pushing the United States out of the top spot it has held since the global system was set up more than 40 years ago, the U.N. patent agency said. According to the WIPO data, China's Huawei Technologies, the world's biggest maker of telecoms equipment, was the top corporate patent filer for the third consecutive year.

According to the WIPO data, China's Huawei Technologies, the world's biggest maker of telecoms equipment, was the top corporate patent filer for the third consecutive year in 2019. The company was able to stay in the lead despite the US campaign that enlisted Huawei in their 'black list' and continued to convince its allies not to use the company's equipment based on a series of allegations and accusations on information security without any evidence.

Huawei is one of the largest patent holders in the world. As of December 31, 2019, the number of active patents held by Huawei exceeded 85,000. The active patents granted in China were 30,000+, and the active patents granted outside China were 50,000+. Of those, active patents granted in Europe and the US were 40,000+.

EU Ranks Huawei Among Top 3 Global Innovators

Huawei ranks third in the 2020 EU Industrial R&D Investment Scoreboard. This is a jump of two places for Huawei compared to last year when the company ranked 5th in the 2019 EU Industrial R&D Investment Scoreboard.

The 2020 EU Industrial R&D Investment Scoreboard is a European Commission publication. It ranks the research investment levels of 2500 companies around the world that comprise 90% of the world's business-funded R&D. The report was prepared by the EU Joint Research Centre (JRC).

Abraham Liu, Huawei's Chief Representative to the EU Institutions: "The EU confirms that Huawei is now among the top three innovative global companies. To maintain the European way of life for its future generations, Europe will need to use the best technologies and innovations. Huawei stands ready to team up with Europe for a joint bright future," said Abraham Liu, Huawei's Chief Representative to the EU Institutions.

Much of the global research that Huawei carries out takes place in Europe. Huawei set up its first research centre in Sweden in the year 2000. Today, through a series of partnerships with over 150 European universities, Huawei is deeply embedded within the ICT research ecosystem in Europe. Through this collaborative research activity, Huawei makes Europe fit for the digital age.

European Patent Office report

By the end of Q1 2020, a report by the European Patent Office said that Huawei filed more patent applications in Europe than any other company last year, pioneering the development of solutions to support digital transformation worldwide.

Of its patent applications, around two thirds of those were in the field of digital communications, including the development of 5G technology. Huawei has already been leading 5G expansion globally, now focusing on vertical industry, ecosystem, and 5G talent development in 2020 including AI, computing and big data. This also includes on building an ICT ecosystem in countries the company is operating in and aims to develop talents in 5G technologies in the year 2020.

Huawei filed 3,524 patent applications in total, far more than the next highest company, and by far the largest filer of digital communications patents. The report noted that US, Chinese and European companies each contributed about a quarter of all applications in digital communications. Applications by Chinese firms have risen nearly six-fold since 2010.

EU Commission issues "5G toolbox", allowing Huawei in 5G rollout

At the start of 2020, the European Union issued a set of guidelines, referred to as the "5G toolbox", and allowed Huawei to continue participating in Europe's 5G roll. The guidance comes just a day after the British government officially approved Huawei's involvement in 5G networks in the United Kingdom following the National Security Council meeting headed by Prime Minister Boris Johnson, which announced allowing Huawei to continue developing 5G networks in Britain.

In a Huawei statement following the publication of the European Commission's



5G toolbox, Abraham Liu, Huawei Chief Representative to the EU Institutions, commented: "Huawei welcomes Europe's decision, which enables Huawei to continue participating in Europe's 5G roll-out. This non-biased and fact-based approach towards 5G security allows Europe to have a more secure and faster 5G network.

Huawei Founder and CEO Downplayed the US Ban at Davos 2020

At the start of 2020, and with the escalation of the United States' campaign against Huawei, Huawei founder and CEO Ren Zhengfei said during a panel discussion held at the annual meeting of the World Economic Forum in Davos that the company has withstood the challenges posed by a US entity list ban last year, emerging as a stronger organization and one committed to international cooperation, thanks to Huawei's employees and their efforts in R&D which resulted on many alternatives, thus led to the continued trust of customers and a stable business despite all the obstacles.

Mr. Zhengfei said his company has "basically stood the challenges" posed by the current US administration in 2019, including being placed on an export blacklist and targeted on various fronts. "The US might further escalate their campaign against Huawei, but I feel the impact against Huawei would not be very significant," he said. "I am confident we can survive future attacks."

He added that Huawei has spent billions

to prepare a "plan B," which has allowed the company to survive the US entity ban. "This year in 2020, since we already gained experience from last year and we got a stronger team, I think we are more confident that we can survive even further attacks," he added. The Founder strongly believes that the world can avoid splitting into two global systems, and does not believe further escalation in technology will lead to two different systems controlled by different global powers.

Speaking at Davos, the CEO also made note of his respect for American companies and championed international cooperation. "Huawei used to be an admirer of the US, we learned a lot from them. We hired dozens of American consulting firms to learn how to manage our business. The US should feel proud of [Huawei], they have the US management system exported and implemented. They should not be overly concerned about Huawei and our position in the world."

Huawei Announces Q3 2020 Business Results

Huawei has announced its business results for the first three quarters of 2020. During this period, Huawei generated USD98.57 billion in revenue, an increase of 9.9% over the same period last year. The company's net profit margin in this period was 8.0%. [1] Throughout the first three quarters of 2020, Huawei's business results basically met expectations.

As the world grapples with COVID-19, Huawei's global supply chain is being put under intense pressure and its production and operations face significant challenges. The company continues to do its best to find solutions, survive and forge forward, and fulfill its obligations to customers and suppliers. Moving forward, Huawei will leverage its strengths in ICT technologies such as AI, cloud, 5G, and computing to provide scenario-based solutions, develop industry applications, and unleash the value of 5G networks along with its partners. Its stated goal is to help enterprises grow their business and help governments boost domestic industry, benefit constituents, and

improve overall governance.

ICT has become a cornerstone of modern society and the main driver behind sustainable social, economic, and environmental development. Huawei believes that rapid and healthy development within the ICT industry will rely on open collaboration and mutual trust across the global industry, so it will continue working closely with its global partners and using its innovative ICT technologies to create greater value for customers despite the complex situation it is currently facing.

The company will continue contributing to pandemic responses, economic growth, and social progress. **I**

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Emirates Islamic becomes first Islamic bank in UAE to launch its award-winning Mobile App on the HUAWEI AppGallery

Emirates Islamic, one of the leading Islamic financial institutions in the UAE, has strengthened its digital banking proposition through a collaboration with Huawei, becoming the UAE's first Islamic bank to launch its mobile banking app on the HUAWEI AppGallery platform.

HUAWEI AppGallery is the third largest mobile app marketplace globally. This new partnership with Emirates Islamic will enable the bank's customers to access their accounts and cards from the convenience of their Huawei mobile devices, allowing them to easily transfer money or apply for products such as finance and credit cards.

The HUAWEI AppGallery has more than 500 million monthly active users globally and above 700 million Huawei devices. The collaboration with a prominent technology company such as Huawei reflects Emirates Islamic's commitment to digital innovation and its ongoing efforts to work with like-



Farid Al Mulla

minded technology partners to deliver seamless and secure banking to UAE consumers.

Farid Al Mulla, Deputy Head of Consumer Banking and Wealth Management at

Emirates Islamic said: "Our partnership with Huawei reflects our commitment to continue driving digital banking innovation in the Islamic financial services sector. Through such partnerships, we aim to continue to enhance our customers' banking experiences by offering safe, secure, easy and seamless banking to smartphone users through the HUAWEI AppGallery."

Lu Geng, Vice President Middle East and Africa Global Partnerships & Eco-Development said: "Huawei works closely with local partners in the banking and finance sector across a wide range of areas during the development of an app from distribution, operation to data analytics and marketing. This focus on supporting high-quality, innovative apps that meet the needs of local users, while also offering popular global applications, has enabled HUAWEI AppGallery to quickly become a top three global app marketplace." **I**

Business in the era of change: Infinet Wireless shares its achievements during 2020

New remote working conditions, digital business transformation, search for innovative solutions, developing new applications for a changing world like we have never seen before: Infinet Wireless shares its achievements of the year during the pandemic.

2020 has been a game-changer for everyone, with our lives changed drastically and forever. The challenges from the pandemic has forced us to take a harder look at everyday things we do and approach them from a different angle. Although the current global economic situation has resulted in many negative outcomes, we saw a fast and increasing trend towards the digitalization of corporate processes and, as a result, have witnessed a very high demand for connectivity and the reliance on the Internet. Over the last few months, the whole world resorted to remote working and distant learning, putting a major strain on service providers of all types. Infinet Wireless, as a provider of wireless infrastructures, has of course been affected but in a very positive manner: we have seen a significant boom and adoption of wireless demand, resulting in a twofold increase in our revenues for the year ending December 2020.

Despite the pandemic, Infinet Wireless continued to expand its geographical reach and presence. We have opened a new regional sales office in the USA, as well as set up a new training facility in Yaoundé, in the Republic of Cameroon.

Our company has relocated its corporate headquarters from Valletta (Malta) to Amsterdam (the Netherlands), and



currently has 19 offices around the world.

New products

One of Infinet's most notable achievement of 2020 was the launch of the Quanta product family of 'point-to-point' solutions, operating in the 5 GHz, 6 GHz and 70 GHz frequency ranges.

Quanta 5 is its record-breaking spectral efficient 5 GHz Point-to-Point solution,

which has already been deployed in a diverse range of applications, and over long distances, from backhauling Wi-Fi and 4G/LTE base stations to video-surveillance and mission critical requirements, as well as meeting the higher-than-expected demand for reliable and high capacity Internet access for both urban and rural locations.

The new Quanta 70 solution marks a new era for Infinet Wireless, as it is aimed at deployments in the 71-76 GHz frequency

band. Its usage brings many opportunities in this band which is unlicensed in most countries of the world. The potential of this new family of products to provide reliable connectivity even over long distances, was clearly demonstrated in a trial with one of our value customer who achieved a 22 Mbps throughput over a distance of 51 km between the two Moscow-region towns of Klin and Dubna.

Infinet Wireless also launched during 2020 our brand new InfiLINK Evolution and InfiMAN Evolution families of products. These Point-to-Point and Point-to-Multipoint solutions, respectively, will initially operate in the 4.9 to 6.4 GHz frequency band, as our R5000 series, but providing significantly higher throughputs whilst being fully backward compatible with Infinet's legacy wireless solutions. These solutions can be used in a multitude of networks and scenarios, delivering higher capacities to remote locations, as well as transmitting high-definition video streams for safer city applications, to name just a few applications.

New services

In 2020, Infinet Wireless Academy developed a number of courses and introduced new learning services for our channel partners and end users. These services include live trainings, online courses with professional certification granted and webinars, all delivered in English, Spanish and French for our diverse international audiences.

Business development and projects implemented

Thanks to the continued loyalty of company's valued channel partners and customers, the company won some significant projects during this challenging year. Some examples include:

- **Connectivity across Pakistan to a major service provider;**
- **Connecting remote sites for a mining company operating beyond the Arctic Circle at the Nor Nickel quarry in northern Russia;**
- **Various new CCTV infrastructures in Istanbul (Turkey), Saint Petersburg**



(Russia) and the State of Zacatecas (Mexico);

- **Expanding coverage to existing wireless infrastructures across Colombia;**
- **A brand new wireless platform for a major operator in Indonesia, based on our new Quanta 5 product family;**
- **Connecting oilfields in the remote corners of China, as well as provide 4G and 5G backhauling to China Mobile, the dominant mobile operator in the country;**
- **Connecting multiple branches and locations for the state bank of Oman;**
- **Connecting most water purification and storage sites across France;**
- **Deployment of a reliable wireless infrastructure for smart cities in Malaysia, ready to cater for all IoT devices of the future.**

Events and participation in industry exhibitions

Even amidst the pandemic, Infinet Wireless managed to take part in two big international exhibitions: SVIAZ-2020 in Moscow and GITEX 2020 in Dubai.

And as part of our major "Going Digital" drive for the years ahead, we also held a number of successful virtual conferences

"Over this difficult year, we kept our supply chain and factory going non-stop and grew our business revenues and geographical reach faster than ever before."

Dmitry Okorokov, CEO of Infinet Wireless

for our current partners, attracting participants from up to 75 countries at one time.

Update of corporate identity

We've finalized updating our corporate identity and relaunched our official website with an updated design. Not only do we offer innovative solutions for our customers in a changing world, but we also adopt change with it. This is what our new website stands for, among other things. Our view to the current situation and prospects for development is fully represented by our new slogan – 'Future is wireless'. Navigating through our website has been made much easier, improving access to the most relevant information to the visitor as well as presenting it in the most concise manner.

"We are all living in uncertain times, and we have to be prepared to adapt our ways and change them quickly when required. Infinet Wireless remains a successful company even amidst this crisis mainly thanks to its ongoing R&D efforts and the loyalty of its partners. Over this difficult year, we kept our supply chain and factory going non-stop and grew our business revenues and geographical reach faster than ever before," Dmitry Okorokov, CEO of Infinet Wireless, summed up. **IT**



GITEX Future Stars' Supernova Challenge 2020 awards

Brazilian startup Jade Autism top prize of US\$50,000

Jade Autism, a startup app that stimulates and develops child cognitive function, has been announced as the winner of the 2020 GITEX Future Stars' Supernova Challenge – bagging the top prize of USD\$50,000. After a hugely disruptive year for the global startup community as a result of the COVID-19 pandemic, GITEX Future Stars, organised by Dubai World Trade Centre, has provided a much-needed boost to the startup ecosystem through in-person industry interaction and the creation of new business opportunities.



After a judging panel shortlisted the most innovative startups from 30 countries, the final day of GITEX Future Stars, the region's most electric startup event, saw 73 game-changing startups from across the globe battle it out for the region's biggest prize, competing in 12 different categories including the coveted Supernova Champion.

After a highly competitive round of pitching which took place on-site at Dubai World Trade Centre on 6th-7th December, the Jade Autism team from Brazil was declared the winner and named Supernova Champion, while the Supernova finalists came from countries

including France, India, Israel, Slovakia, South Korea and the United Kingdom.

Jade Autism is a platform that develops gamified therapeutic solutions for children and adolescents with cognitive disabilities. A startup from Brazil but now based in Abu Dhabi's Hub71, Ronaldo Cohin, CEO of Jade Autism: "I am so happy; I didn't expect to be the champion as there are so many special companies here at GITEX Future Stars. I dedicate this prize to all the people and families of autism; we are a community and we care for each other. We are growing as a company and will use the money

to invest and expand in the UAE."

One Moto from the UAE, which specialises in electric vehicle last-mile solutions, and Radix Technologies from Israel, which focuses on classroom management solutions, won the runner-up prizes of US\$10,000 each.

BeeFree Agro from Israel, a drone-based autonomous herding system capable of moving large herds over extensive pastures, was the bonus runner-up winner that also won USD \$10,000.

This year's edition of the Challenge introduced four new vertical prizes, including Best Innovative COVID-19 solution, Best Martech Startup, Best Social and Environmental Impact and Best Fintech Startup – alongside returning categories Emirati Startup, Ai Startup, International Startup, Youth, and Female-led Startup.

Radix Technologies was awarded the title of the Best Innovative COVID-19 solution. French startup Switchy, a leading innovator in social media link optimisation, was named

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International Innovation and Wisdom Awards (IIAWA), Dubai

Tahir Alam

International Innovation and Wisdom Awards are being held in Dubai on 31st March, 2021 where top innovators and innovative companies of the World are recognized and awarded for their knowledge and contribution to the human race.

Innovation and wisdom are correlated as without wisdom there cannot be any innovation. Innovation in the general sense is a driver of growth for businesses and national economies; and it is a major contributor to societal welfare. Wisdom is the quality of having experience, knowledge, and good judgment; the quality of being wise.

IIAWA is promoting and awarding innovative companies and celebrating their achievements in Dubai and also highlighting Dubai as the hub of innovative and technological achievements.

Some of the top corporations of the ICT and Telecom industry are recognized and awarded as well for their technological innovations, inventions and contributions. Poland based President of IIAWA and MK Works, Masaud Khan told Teletimes International that he has been working on humanitarian projects for most of his adult life learning from the wisdom of wise men. This path of learning made him admire the ingenuity of the human race and its business leaders overseeing the development of inventing



Masaud Khan
President IIAWA



Sultan Jahangir
CEO Ebawa Group & DSI

new technologies and making him realize that this is not possible without the wisdom of the wisest among us.

Masaud said, "I came to Dubai and met one of the wisest man I know, Mr. Sultan Jahangir, who is the CEO of Delta Smart Innovation, an innovative company based in Dubai, and together we came up with this project. Mr. Sultan Jahangir has always been a big inspiration in my life." Basically Masaud is connecting humanity

and science. He remarked, nothing is possible without goodness. Hard work is good. It makes you learn. Our virtues make it all possible. When you read the biographies of great scientists or artists or musicians you realize they are all thrived coz they were great wise people. In response to a question Masaud Khan said, IIAWA is a project where all great minds get assembled inspiring and learning from each other while we recognize their achievements for many to be inspired. **T**

www.iiawa.org

GITEX Future Stars' Supernova Challenge 2020 awards

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as the Best Martech Startup, while Jade Autism bagged the title of the Best Social & Environmental Impact. BC Labs from South Korea was adjudged as the Best Fintech Startup.

Other winners included:

- **Best Ai Startup:** iERP, a business prediction platform from Slovakia, helping retail, wholesale and manufacturing companies to increase revenue and reduce costs
- **Best Emirati Startup:** Gallant Pump, from the UAE, a reliable valve-less pump solution that offers trouble-free treatment reduce the blocking caused by fluid particles
- **Best International Startup:** BeeFree Agro, the

Israel-based autonomous drone herding system designed to help ranchers save time and money, reduce animal stress and their carbon footprint, and increase yields and productivity.

- **Best Female-Led Startup:** Jaaem, the UAE-based 'shopping while watching' e-commerce platform for cosmetics lovers that focuses on user-generated content to drive sales
- **Best Scaleup:** One Moto, the last-mile electric vehicle manufacturer based in the UAE
- **Best Youth Startup:** Dreezrock Ventures, from India, the gamified social media platform to create, share and network using comical characters, objects and backgrounds

Part of the judging panel, Massimo Cannizzo, CEO and Co-Founder, GELLIFY Middle East, said, "GITEX Future Stars is the place to be, not only giving tech talent the chance to showcase

ideas and products, but also fostering a great culture of entrepreneurship and innovation. For GELLIFY, it is a unique opportunity to witness great ideas come to life, as well as identify talented B2B tech startups in the region that can join our portfolio to benefit from our program."

"GITEX Future Stars has provided a critical and opportune live, in-person event for startups that has allowed them to reconnect with the funding ecosystem after the hiatus inflicted by the pandemic. It is a privilege to support startups by reconnecting them to vital stakeholders and industry influencers who are looking for newfound opportunities created by the disruption of the pandemic," said Trixie LohMirmand, Executive Vice President, Events Management, Dubai World Trade Centre. **T**

Integrasys and VideoFlow join the Satcoms Innovation Group



The Satcoms Innovation Group welcomes two new associate members, Integrasys and VideoFlow. The newcomers join a large group dedicated to promoting innovation within the satellite communication industry, with the aim of improving operational efficiency and reducing impact.

Integrasys specializes in engineering and manufacturing satellite spectrum monitoring systems for the telecommunication and broadcast markets since 1990.

The company offers a range of signal monitoring products as well as VSAT deployment and maintenance and link budget solutions to enable efficient and error-free satellite networks.

Integrasys was recently awarded a 1.5million Euro project for interference cancellation and removal technology by the European Space Agency.

Alvaro Sanchez, CEO, Integrasys, commented: "The Satcoms Innovation Group provides us with a unique platform to understand the challenges faced by our customers so that we can continue to develop innovative solutions to resolve those."

VideoFlow is driving the evolution of digital video contribution and distribution to IP networks. VideoFlow products and solutions enable professional broadcast companies including TV stations, TV station groups, teleports, and cable operators to broadcast live with confidence over any IP network, including over the internet. The VideoFlow Hybrid Sat/IP ecosystem pairs satellite with IP to increase satellite service reliability and operational efficiency.

Adi Rozenberg, Co-founder, VideoFlow, added: "We are looking forward to working together with the satellite community to enable satellite to adapt

and stay relevant in the next generation environment."

The Satcoms Innovation Group promotes innovation within the satellite communications industry, with the aim of improving operational efficiency and reducing impact. As a group made up of technical experts that understand the challenges in operational environments, it is uniquely positioned to drive technical evolution within the industry.

Helen Weedon, Managing Director, the Satcoms Innovation Group, said: "We are happy to be welcoming both Integrasys and VideoFlow to the group – both companies provide innovative solutions that will enable the satellite industry to stay innovative and competitive. The global pandemic has caused havoc inside and out of the industry, but by working together and collaborating amidst these difficult times, satellite communications can continue to thrive." **T**

How do Cyber Criminals Hack your Mobile in the Digital Age ?

The word 'hacking' is defined as compromising or gaining access without particular individuals' permission in an unauthorized manner. In today's digital world, it is one of the most common or rational fears. As technology evolves, hackers too are evolving as even the most upgraded software is being hacked. According to an article in a leading news portal, in the year 2018, more than 2.5 Billion accounts were hacked which is about 6.85 million accounts hacked every day. This is a statistic that we do not want to think about.

How can your device be hacked?

A Hacker has many ways to hack your phone. The more technology gets evolves, the more are the ways for it to get hacked. There are many applications online that are available for free which in turn gives free access to hackers at any given moment. Let us enlist some common ways through which a device can be hacked.

Phishing

Phishing is one of the most common ways through which your phone can be hacked. Phishing is nothing but a link that is generated in the form of a text message or any forwarded message. Once an individual click on that particular link, all the data in his/her phone gets compromised or you can say that theft of data takes place almost immediately. This can also happen via Internet Banking websites which can prove to be very harmful as all your hard-earned savings might get stolen.

Malicious App via Unknown Source

Any Application which is downloaded via an unknown source can be a malicious or a suspicious app. It may also be a spy application which records all your activity. When we install any application via an unknown source, it may also have another application bound with it. Such types of apps are often in hidden mode and hence most are unaware of their existence on their devices.

Juice Jacking



Juice Jacking is a type of cyber-attack that allows a charging port to double as a data connection through a USB. Whenever we are traveling, we usually connect our phones to free battery charging stations, unaware of the fact that there might be a juice jacking setup. Through juice jacking, our data may be stolen through the charging cable which is, in reality, a data cable. Through this, your precious and private data is captured and the hacker can further debug a spy application, which allows all your mobile data to be monitored.

Social Media Accounts

Social Media is the reason why most teenagers and adults use their respective phones. Social Media has brought people closer, connected people, but it has its disadvantages and risks too. It is quite common to sign up on a social media account through Gmail but we are unaware of the possibility of a malicious or a spy app attached to it. Once signed up to such an app, it can manage your social media accounts and post images and messages on your behalf. Recently, there was a trend about "How will you look after 5 years". Once you click there, it asks for your permission to access your devices' camera, files, or your account. If the permission is granted, the game actually gave access of your social media accounts to malicious third-party applications.

Ways your phone can be hacked and how to prevent it?

Install any paid anti-virus application which will help detect the vulnerabilities in your device. With the help of the application, you can check whether there is any spy application on the device or not. It can also detect the number of applications that have been downloaded from unknown sources.

You can check if your USB debugging setting is turned on or not. You can also check whether your social media accounts have third-party access or not. If you want to verify any phishing links, you can verify it by using anti-phishing solutions. You can use a physical security encryption key for robust protection of your device. The chances of your iPhone getting hacked through iCloud credentials are high, setting up two-factor authentication for an iCloud account is advisable.

One should always update their phone whenever there are any new updates. A device without an update can be very vulnerable and has a higher chance of getting hacked. Always avoid connecting your device to the free Wi-Fi networks as your data can easily get stolen. Even if you are using regular Wi-Fi, try to use VPN Paid solutions.

Threats faced due to hacked device:

Magnitude or the type of threat differs from person to person and how they use their devices. A hacker can hijack your accounts and can change your password because of which you will have no control or access to your account. They can use your data in the most unauthorized way possible that includes indulging in criminal activities. A hacker can check your phone to go through your private content, photos as well as videos.

They can also get access to your camera and microphone. For E.g. Any confidential meeting – official or otherwise can be spied on with the help of a compromised microphone or camera which can be used to leak the information or use it against you. **■**

Etisalat adopts Blockchain technology in HR

Etisalat has announced a new initiative that aims to empower employees with Blockchain-powered digital HR credentials, becoming the first to implement this cutting edge digital technology in the region.

Implemented in partnership with Chainrail.com, Etisalat is providing lifetime access to all HR letters, empowering employees with tamper-proof data at their fingertips. The objective of the blockchain implementation is to ensure all employees can generate, access and utilise credentials 24/7 and 365 days, while credential verifiers can do the same without any dependence on manual intervention.

Dena Ali Al Mansoori, Group Chief Human Resources Officer, Etisalat, said: "The future of work is here. Our world changed in 2020 and Etisalat's overall strategy to 'Drive the Digital Future to Empower Societies' has never been more important. Making this digital future a reality and bringing the technologies of the future to all our customers across our markets unites and fuels us. The HR team is focused on bringing that reality within Etisalat to empower our employees, increase engagement, organisational efficiency, and create an incredible employee experience."



"Implementing Blockchain technology in HR ensures employee data is under their control and is secure and accessible anytime, anywhere. Deploying these technologies efficiently and responsibly across our communities and within our organisation is a top priority. Etisalat has some of the most talented and innovative minds in AI, Robotics, Blockchain and other technologies and as our society continues to transform digitally, we will continue to focus our efforts on these capabilities as part of our recruitment and talent strategy in 2021 and beyond."

This is a classic example of how Etisalat is implementing and benefiting from Blockchain on top of helping government and private organisations on the adoption of this emerging technology, such as in the blockchain trade finance platform UAE Trade Connect or the 'Shahada' Blockchain platform for digitising education certificates. In addition to Blockchain, Etisalat HR has also soft launched an 'HR Virtual Assistant', a chatbot equipped with a complete set of FAQs and HR policies. In the next phase, 'HR Virtual Assistant' will be enhanced with a comprehensive interface for all Etisalat employees and will serve as an omnichannel in providing all HR services such as applying for leave and claims, requesting letters and other employee-related requests. Etisalat has also successfully implemented Robotic Process Automation (RPA) into HR processes, enabling HR teams to streamline processes resulting in faster and more accurate data or request verification. Some of the RPAs verify educational claim, sick leave and business travel as well as job postings. On the learning front, Etisalat offers iQra, a mobile first, AI powered learning platform, available for all employees and offers the highest quality digital learning from any device, anywhere they are based. **■**

Etisalat joins AWS Direct Connect Service Delivery Programme

Etisalat has joined the AWS Direct Connect Service Delivery Programme to offer fast, private, and secure connectivity for accessing AWS cloud services. This enables Etisalat's customers to accelerate adoption of AWS cloud solutions by using high performance and secure direct connectivity, providing customers with more choice in line with Etisalat's multi-cloud strategy.

As an AWS Consulting Partner, Etisalat will support customers in their journey to move to the AWS cloud by delivering high-speed, dedicated connectivity, ensuring low-latency, consistent network experience, and robust security for customers leading to high performance levels and availability.

Salvador Anglada, Group Chief Business Officer, Etisalat said: "We are proud to be partnering with AWS to become the first telco in the UAE to offer cutting edge cloud

connectivity solutions to all our customers. Etisalat's expertise with AWS services will help customers in building a hybrid cloud environment. This is also a testimony to Etisalat's commitment to its vision of 'Driving the digital future to empower societies' and supporting all customers in their digital journey."

Zubin Chagpar, Head of Middle East and Africa, Public Sector, AWS said: "We welcome Etisalat to the AWS Direct Connect Service Delivery Programme. As a leading telco in the region, this creates more opportunities to help organisations in the UAE to accelerate their digital transformation by migrating critical applications even faster to AWS. We look forward to continuing to work with Etisalat to bring more solutions that enable fast and secure cloud adoption."

AWS is enabling scalable, flexible, and cost-



effective cloud solutions from startups to global enterprises. To support the seamless integration and deployment of these solutions, AWS established the AWS Service Delivery Programme to help customers identify AWS Consulting Partners with deep experience delivering specific AWS services. **■**

Ministry of IT pitched 3 start-ups from Ignite NIC Program in GITEX



GITEX Technology Week serves as home to tech startups. Amid visa and COVID-19 restrictions, the Ministry of Information Technology and Telecommunication successfully pitched 3 startups from Ignite NIC Program.

Among the participating startups – WALEE, Pakistan's largest and fastest growing influencer and social commerce platform, that enables businesses to discover, contract, collaborate and pay influencers

who market and sell for them at scale. Today, 50,000+ influencers and businesses across 250+ cities are on Walee.pk. SE Drop (Save Every Drop) is another startup showcased at the mega event, offering two product lines - one: wastewater recycling systems to deal with water scarcity and second: natural, alcohol and chemical-free disinfectants. While the third startup, encore pay is a fintech which provides a digital payments platform to financial institutions including banks, telecoms and payment networks.

All three Ignite NIC Program startups attracted interest from the public and private entities. Walee discussed with major global and regional brands, PR, social and digital agencies to implement scalable solutions for a 2021 rollout via www.walee.ae. SE Drop attracted interest from Dubai Electricity and Water Authority (DEWA), Dubai Municipality, Fujairah Municipality, UAE and private investors from Bahrain and Turkey for the collaboration in wastewater recycling management systems. GITEX-veteran, encore pay, reconnected with clients and partners from Middle East and Africa, and also received positive traction for its product suite from leads in new locations, as well as VC interest. Notwithstanding the pandemic, GITEX 2020 was the only major in-person technology event to go live this year with more than 1,200 innovative tech enterprises, startups and government entities from 60 countries; over 200 of the most active investors and VCs from 30 countries; and over 350 speakers from 30 countries. **1**

PTCL, Avaya partner to enable blended work environment in Pakistan with launch of Avaya Spaces

Pakistan Telecommunication Company Limited (PTCL) and Avaya Holdings Corp have signed a partnership agreement where PTCL will launch Avaya Spaces, the all-in-one workstream collaboration app for the digital workplace, for the first time in Pakistan. The partnership will enable organizations to implement blended and flexible environment for their employees.

In collaboration with PTCL, Avaya will provide free, full-feature access for a limited time to customers in Pakistan. Avaya Spaces is an all-in-one video meeting and workstream collaboration platform for the digital workplace that changes the way work gets done in nearly 100 countries. It helps businesses, schools, governments and other organizations to bring together distributed groups of people instantly with immersive workspaces where they can message, meet,

share content, manage tasks and collaborate in the Cloud. Speaking on the occasion, Zarrar Hasham Khan, Chief Business Services Officer, PTCL, said, "We are continuously working towards empowering organizations within Pakistan and supporting the vision of a Digital Pakistan. In the present circumstances, where most of the organizations are offering flexible working environment, our partnership with Avaya is the step in the right direction. Not only that, such solutions are much needed in the educational sector as it offers a more blended learning and working model. It will certainly create opportunities to streamline and support schools and universities as it introduces an innovative way to learn and deliver lectures. Speaking on the collaboration with PTCL, Nour Al Atassi, Director, Service Providers, Middle East, Africa & Asia, Avaya, said, "Globally our customers are leveraging Avaya Spaces to create the future digital workplace and to

enable new and innovative education delivery models. With PTCL introducing solutions such as Avaya Spaces, Pakistan will be well on its way to achieving its digitalization goals. PTCL has already invested in an innovative and robust telecommunications network that is serving as an enabler of business continuity across the country. Together, we look forward to supporting the blended delivery of essential services with Avaya Spaces."

Avaya Spaces has seen significant growth since its introduction and has been an especially important solution for organizations addressing the challenges of COVID-19. At the peak of the pandemic, Avaya Spaces was offered for free to enable companies, schools, governments and organizations of all kinds to adapt to remote work and collaborate, stay connected and be productive while keeping employees safe. **1**

5G holds the key to Saudi Arabia's Digital Future

At the dawn of a new decade, we have continued to leverage our technology towards our customers and achieved a significant milestone by securing the company's 100th commercial 5G contract. As we celebrate this momentous occasion, we also celebrate being on the forefront of the 5G race and take a moment to look ahead at the mountains we must still climb.

Saudi Arabia was one of the first countries in the Middle East region where we collaborated with local operators to launch 5G. That is because Information and Communications Technology (ICT) is an important driver of Saudi Arabia's digital economy which supports Saudi Arabia's Vision 2030 toward economic diversification.

Above all, our 5G leadership will enable service providers champion technology that will help people of Saudi Arabia live healthier, more fulfilled lives, communicate wherever, and whenever, in real time and stay connected to the world around them with unlimited possibilities.

With 56 live 5G networks and 58 5G public contracts, Ericsson's end-to-end 5G platform enables Saudi service providers to develop new 5G capabilities at a pace that matches their own business strategy – boosting current 4G business by making best use of existing infrastructure while evolving to the new technology.

This transformative collaboration between leading telecommunications service providers in Saudi Arabia and Ericsson is allowing the Kingdom's people, businesses and society to fulfill their potential and create a more connected future.

A futuristic vision

As part of Vision 2030, Saudi Arabia's government aims to develop ICT infrastructure, especially high-speed broadband, expand its coverage and capacity within and around cities and improving its quality. Its specific goal is to exceed 90% housing coverage in densely populated cities and 66% in other urban zones. Hence, Saudi Arabia is developing building standards to facilitate the extension of broadband networks as well as strengthening the governance of digital transformation through a national council. Key drivers for immediate 5G deployment include increased network capacity, lower cost per gigabyte and

new use case requirements.

Additionally, the Kingdom is working on establishing an effective partnership with telecom operators to better develop this critical infrastructure. In doing so, Saudi service providers face four key challenges while offering mobile broadband:

1. To manage exponential data traffic growth
2. To cater for rising speed and quality expectations
3. To monetize added customer value.
4. Nationwide 5G coverage

By enabling massive and highly cost-efficient capacity expansion & Ericsson Spectrum Sharing (ESS), 5G can help operators to address these challenges, while also creating significant economic benefits. Through advanced technologies that support digital transformation, Saudi service providers can align their digitization strategy with Saudi Arabia Vision 2030. This has wide regional ramifications, as there are great economic benefits in taking advantage of a new wireless technology first, highlighted by the boom in the app economy in the region after its adoption of 4G.

A digital transformation

5G is the backbone for transformation in transportation and industries both in Saudi Arabia and across the Middle East and Africa—driving economic value in areas from enhanced mobile broadband to digital industry to helping combat climate change.

With unique ecosystems, advanced universities and high-tech companies, Saudi Arabia's major cities are the perfect locations to launch 5G services with unprecedented speed and flexibility to empower innovation and a variety of use cases. For service providers, it offers tremendous potential for new and better customer experience while improving revenue streams.

Nowhere was this more evident than the holy pilgrimage of Hajj in 2019. Ericsson expanded local network coverage and enhanced end-user experience with the aim to provide one of the best networks during Hajj pilgrimage, which hosted around 2.5 million pilgrims. As a result, the pilgrims connected 24/7 with higher throughput than previous years.



Fadhel Isa, CTO at Ericsson KSA

As a network that caters for current and future services, 5G holds an immense potential for driving industry digitization and pioneering innovation. 5G will provide capacity to handle growing data traffic, as well as present opportunities for operators to grow top-line and improve their consumer business.

Mobile communications and the introduction of 5G could become significant enablers for Industry 4.0. In addition to facilitating the delivery of next-generation mobile broadband, cloud, and providing support for massive Internet of Things (IoT) deployment, 5G will also support new industry use cases thanks to increased throughput and reduced latency.

With a proactive approach on the evolution to 5G, investments in 5G-IoT use cases such as smart factories, connected vehicles, tactile shopping and smart cities will generate opportunities worth billions for Saudi service providers.

That said, Saudi Arabia's 5G future ultimately depends on consumer expectations. Our research has helped us to understand how consumers both experience and think when it comes to 5G usage. In times of crisis such as the current pandemic, when connectivity is important for consumers to carry out work- and leisure-related activities, expectations for better network experiences become higher. Given its continuous investment in advanced networks that support next generation technologies we believe that Saudi Arabia is on its way to solidify its role as a center for innovative excellence and it gives us great honor and pride to play a role in this journey by supporting the local communications service providers in the Kingdom. **1**

IEEE 23rd International Multitopic Conference



The 2020 IEEE 23rd International Multitopic Conference (INMIC) was held at Islamia University of Bahawalpur (IUB), Pakistan from 5th – 7th November in collaboration with IEEE Lahore Section and IEEE Bahawalpur Subsection. The conference was sponsored by IEEE Bahawalpur Subsection and IEEE Communication Society (ComSoc) Lahore Section. The IEEE INMIC is the flagship annual conference of IEEE in Pakistan being organized in rotation among IEEE Lahore, Karachi, and Islamabad Sections with focus on multidisciplinary topics in the field of electrical & electronics engineering, computer systems engineering, computer science, and allied fields. This conference received an overwhelming response with around 450 submissions from industries, academia, and research institutions with an acceptance rate of 35%. The 3-day event included five keynote talks delivered by speakers from Finland, France, Malaysia, UK, and Pakistan. The conference also featured twelve technical oral tracks, namely Renewable Energy, Image Processing, Intelligent Systems & Application, Machine Learning, Power Systems, Smart Systems, Biomedical Image Processing, Information & Software Technologies, Signal Processing, Controls Systems, Antenna & Microwave Communications, and Internet of Things.

Prof. Zainal Bin Salam, a distinguished keynote

speaker from Centre of Electrical Energy Systems, Universiti Teknologi Malaysia talked on "Building the Solar Photovoltaic Systems Industry Ecosystem". The presentation highlighted some of the initiatives by the Malaysian government, industries, and financial sectors to build the right ecosystem to increase the share of photovoltaic (PV) in the local energy mix. It also describes the evolution of strategies for sustainable growth: pilot projects, the feed-in-tariff, net metering, and proliferation of large scales systems. Prof. Muhammad Ali Imran, Dean University of Glasgow, UESTC, United Kingdom (UK) delivered the second keynote talk on "Overcoming digital divide by connecting the unconnected – technology enablers and future overview". The talk focused on the digital divide that results in a growing gap between the rich and the poor. The problem exists in western developed countries and severe in Africa and Asia. New generations of the technology should be designed keeping in mind that these new technologies should be part of the solution for this problem. A case study of 5G communication technology was presented to identify the technical approaches as well as the practical initiatives addressing the challenge of the digital divide.

Prof. Anouar Belahcen, Aalto University, Finland enlightened the audience on "Numerical Analysis of Synchronous Machines

by Coupled Circuit and Static Field Equations". A systematic approach was presented for coupling the space-vector model of a synchronous machine with the static field equations and solves the whole system of equations with the finite element method to reduce the computation time needed for the simulation of such machines without losing accuracy.

Prof. Azeddine Beghdadi, University Paris 13, France delivered his keynote talk on "Image Quality in the Context of Medical Imaging and Diagnosis" in which he discussed the use of image quality assessment and enhancement concepts and tools in the context of medical diagnosis. The talk mainly focused on a less explored subject in the field of medical imaging i.e. the meaning and the role of objective image quality in the medical context and more specifically in computer-assisted diagnosis and surgery. The talk also provided an overview of recent developments in this field, particularly methods and technologies based on artificial intelligence.

The Vice-Chancellor IUB Prof. Dr. Athar Mehboob presented the final keynote session on the role of leadership in the engineering profession. He focused on the attributes necessary for professional engineers, researchers, and students to become a leader in their fields. ■

Ericsson and Singtel drive high-end 5G connectivity to benefit Singapore

Ericsson and Singtel are accelerating their 5G partnership in Singapore through the deployment of high-end 5G technology. This is enabled by 5G New Radio (NR) Standalone and dual-mode 5G core network products and solutions, including real-time rating and policy control.

The energy-efficient, end-to-end 5G network will operate on Singtel's 3.5GHz and 28GHz spectrum bands, spanning outdoor and indoor 5G coverage use. Millimeter wave (mmWave) connectivity will also be deployed in hotspots across the city state.

Ericsson's radio and core solutions will ensure that residents, enterprises, industry and government authorities in Singapore -- renowned the world over as early technology adapters and hi-tech innovators -- are among the first in the world to benefit from the highest performance

that 5G can offer. 5G-enabled application use cases could include cloud gaming, immersive virtual reality/augmented reality, robot-human collaboration in real-time, autonomous transport, remote healthcare, precision smart manufacturing and smart nation connectivity.

This 5G contract award takes the partnership between Ericsson and Singtel to new levels, as Industry 4.0 gathers pace globally. Singapore was recently named world's most competitive economy for the second successive year in the latest IMD World Competitiveness Ranking.

Mark Chong, Group Chief Technology Officer, Singtel, said, "As the leading telco in Singapore, Singtel is committed to building a secure, resilient, world class 5G network that will serve as the backbone of Singapore's digital economy. We are pleased

to be working with Ericsson, leveraging on its industry leading 5G capabilities, and to deliver innovative applications and transformative customer experience for our consumers and enterprise customers."

Martin Wiktorin, Head of Ericsson Singapore, Brunei and Philippines, says: "Singtel is determined to play a leading role in keeping Singapore at the cutting edge of technology innovation and to ensure that the whole nation benefits from 5G. To do so they need the best 5G technology on the market. At Ericsson, our global leadership is evidenced by our extensive deployment experience with 75 live 5G networks worldwide. As a long-standing partner, we are equally determined to work alongside Singtel to ensure its subscribers and business customers enjoy the best experiences and opportunities that 5G has to offer." ■

Nigeria's mobile phone market bounces back to post healthy growth

Smartphone shipments into Nigeria increased 13.7% quarter on quarter (QoQ) in Q3 2020 to almost 3 million units, according to the latest figures from global technology and consulting services firm International Data Corporation (IDC). The firm's newly published Quarterly Global Mobile Phone Tracker shows that Nigeria's smartphone market remained healthy in the third quarter as vendors shifted their model portfolios to entry-level and mid-range devices.

Transsion's Tecno, Itel, and Infinix brands dominated smartphone shipments in Q3 2020 with a combined 76.4% share. Samsung placed second with 7.0% share and Xiaomi placed third with 5.3%. Chinese brands continue to invest in the country as they attempt to penetrate the market and gain a foothold.

The average street prices of smartphones declined marginally (0.3%) as the dollar exchange rate remained high. The increase

in VAT by 2.5 percentage points also had a negative impact on prices. With the relaxation of COVID-19 measures, the majority of consumers returned to the physical retail channel in Q3 2020, leading to a 21.5% QoQ increase in retail sales.

Feature phone shipments rebounded strongly in Q3 2020, with shipments increasing 21.2% QoQ to account for 56.0% of the country's overall mobile phone market. Feature phones remained resilient as they continue to be the preferred secondary phone in an environment of declining consumer purchasing power and rising unemployment. The major players in the feature phones space in Q3 2020 were Tecno with 49.7% share, Itel with 34.8%, and Nokia with 8.2%.

"In light of the economic hardships caused by the COVID-19 pandemic, vendors continued to ship more affordable devices priced below \$200 as they sought to address demand for

cheaper models and penetrate consumer segments with lower purchasing power," says George Mbutia, a research analyst at IDC. "This strategy of offering more devices in the entry-level and mid-range price bands (<\$200) ensured a faster market recovery from the weak performance seen in Q2 2020, which was heavily impacted by COVID-19."

IDC expects Nigeria's overall mobile phone market to grow 3.1% QoQ in Q4 2020, with feature phone shipments increasing 1.9% and smartphone shipments growing 4.7%. "Promotions from the end of November through the festive month of December will support the market's growth in Q4 2020," says Ramazan Yavuz, a senior research manager at IDC. "COVID-19 will continue to pose a threat to the overall economy and, in particular, to mobile phone markets. However, smartphone shipments will remain resilient in 2021, with customers moving from feature phones to smartphones and data usage increasing in the medium term." ■

GLOBAL ICT, TELECOM & SATCOM EVENTS 2021

27-28 January 2021



London, UK

23-25 March 2021



Bahrain

24-26 May 2021



Dubai, UAE

09-11 June 2021



Singapore

10-14 September 2021



Amsterdam, Netherlands

02-04 November 2021



London, UK

23-25 Feb 2021



Shanghai, China

24-26 March 2021



New Delhi, India

31 May-02 June 2021



Dubai, UAE

15-16 June 2021



Dubai, UAE

29-30 September 2021



Dubai, UAE

8-12 November 2021



Cape Town, SA

15-18 March 2021



Washington DC, US

06-07 April 2021



Muscat, Oman

08-10 June 2021



Cologne, Germany

23-24 June 2021



Arlington, USA

09-13 October 2021



Las Vegas, US

16-17 November 2021



Bangkok, Thailand

22-24 March 2021



Dubai, UAE

26-27 April 2021



Virtual

08-10 June 2021



Madrid, Spain

28 June-01 July 2021



Barcelona, Spain

12-14 October 2021



Amsterdam, Netherlands

01-03 December 2021



Baku, Azerbaijan

23-24 March 2021



Dubai, UAE

04-05 May 2021



Sydney, Australia

09-11 June 2021



Singapore

26-29 July 2021

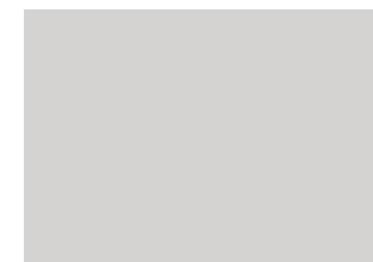


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