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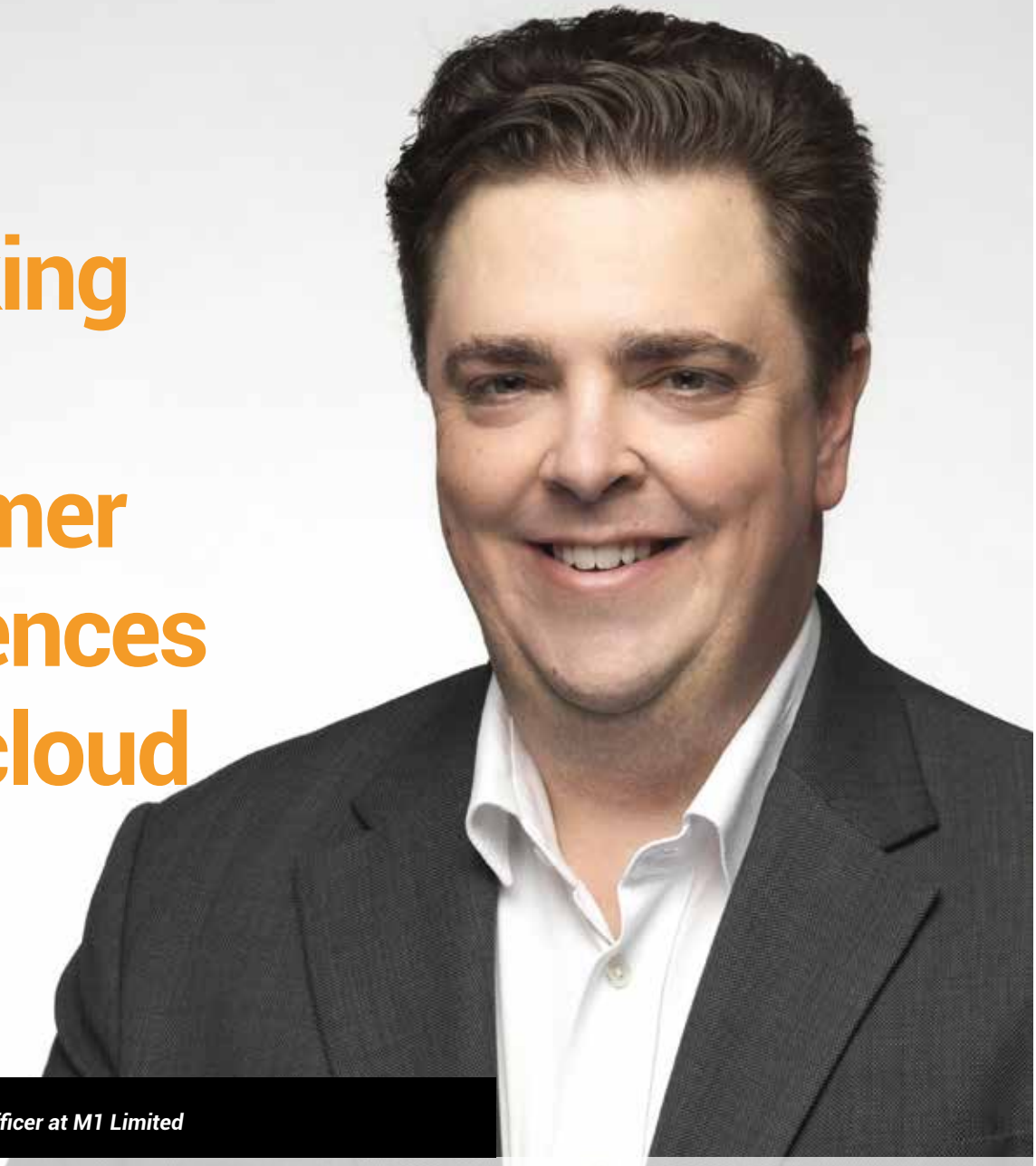
Unlocking new consumer experiences in the cloud



Nathan Bell, Chief Digital Officer at M1 Limited

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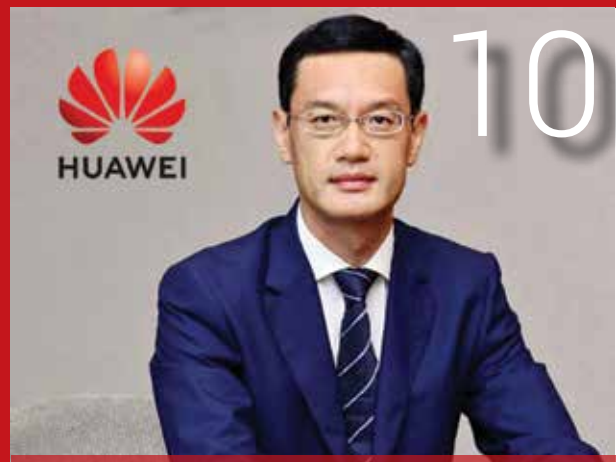

Editor in Chief & Senior ICT Analyst
Toni Eid
toni.eid@tracemedia.info

Journalist
Corrine Teng
corrine@telecomreviewasia.com

Editorial Team
Toni Eid (UAE), Marielena Geagea (Lebanon), Yvan Kougaz (Lebanon), Jennifer Saade (Lebanon), Lacinan Ouattara (Ivory Coast), Jeff Seal (United States), Christine Ziadeh (Lebanon), Corrine Teng (Singapore), Jonathan Pradhan (UAE), Elvi Correos (UAE), Elza Moukawam (Lebanon)

Sales Director
Mohammed Ershad
ershad@tracemedia.info

Sales Team
Paul Tan
paul@telecomreviewasia.com

Marian Santos
marian@telecomreviewasia.com

Graphic Designer
Vanessa Haber

Responsible Manager
Joseph Bou Daher

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tracemedia Ltd.
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Singapore
Corrine Teng; Paul Tan

Philippines
Marian Santos

Trace Media Ltd.
Zouk Mikael, LEBANON
Kaslik Sea Side Road,
Badawi Group Building, 4th Floor,
P.O. Box 90-2113, Jdeidet el Metn
Tel. +961 9 211741
Fax +961 9 211742

Trace Media FZ.LLC.
Dubai Media City, UAE
Building 7, 3rd Floor., Office 341
P.O. Box 502498, Dubai, UAE
Tel. +971 4 4474890
Fax +971 4 4474889

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Toni Eid,
founder
editor in chief
Telecom Review International

IPv6 and its importance in digital transformation

Following the success and positive impact of last year's edition, Telecom Review held a webinar earlier this month, entitled "IPv6 Enhanced Innovation: Paving the way for digital transformation in the Gulf region."

This year's edition focused on the national digital development and digital transformation in the Middle East and Gulf region. Industry experts from telecom operators, regulators, analysts and vendors participated as speakers to share their business experience and their expertise.

The challenge started years ago when IPv4 reached its full capacity, which was just 4 billion, while 7 billion devices need to be connected. So, IPv6 was very important to continue the expansion of connectivity.

With 5G, IoT and more devices to be connected, and with governments and enterprises shifting services to fully digital and with smart cities, even IPv6 was not enough.

So, the need to move faster and invest in IPv6+ will lead the way to digital transformation as the pandemic pushed for a fully digital economy.

The IPv4 adoption will continue for years to come while IPv6 is using same basic technology with larger capacity and more flexibility to work on new networks with faster connectivity and more bandwidth.

Our commitment as Telecom Review Group to organize series of webinars rich in content and very insightful, with the best speakers of the industry and engage the whole ICT ecosystem, will persist for years to come.

Nathan Bell, Chief Digital Officer at M1 Limited

M1: Unlocking new consumer experiences in the cloud

To deliver next-generation digital experiences and differentiated services to its customers, M1 is partnering with Microsoft to harness the power of cloud to accelerate its digital transformation journey. Telecom Review Asia interviews Nathan Bell, Chief Digital Officer at M1 Limited and George M.P., Director of Enterprise Commercial at Microsoft Singapore to find out how this collaboration drives M1's ambition to become a digital service provider and add value to customers.

Earlier this year, M1 unveiled a new brand identity and goal to become Singapore's first digital network operator, how is this direction important today and in a post-pandemic world?

Nathan:
Even before the pandemic, we have already seen a shift in consumer behaviour towards digital platforms and services, and COVID-19 has further accelerated this shift. With changing consumer behaviour and the advent of digital interactions, it was important for M1 to relook how we can remain relevant.

As much as the pandemic threw a wrench in many plans, it also highlighted the need to accelerate digital transformation not only for M1, but for many other organisations. As such, M1 embarked on a journey to evolve into a digital telco to increase scalability and enhance customers' self-service experience so that people can work from anywhere and everywhere. This enhanced our ability to connect with new partners in weeks instead of months – all done to achieve the larger goal of customer centricity and to deliver personalised made-to-measure experience.

In line with Keppel's Vision 2030, which includes empowering communities with connectivity, M1 is doubling down on innovation and radical growth in

George M.P., Director of Enterprise Commercial at Microsoft Singapore

our technology infrastructure to stay ahead in the digital landscape. Our advanced new digital capabilities that further support our promise to deliver personalised experiences, will ensure M1 is at the forefront of building Singapore's digital economy and transforming the telecommunications landscape.

George:
COVID-19 has shown very clearly the critical role that telco operators play in our society and economy. The shift to a hybrid way of life and increased virtual engagement – from remote working to online learning – has driven demand for connectivity services and hybrid work and play experiences on an unprecedented scale.

The rapid evolution of the internet into a primarily mobile platform has also changed consumer behaviors and their digital consumption habits. Consumers now expect digital services to be seamlessly available – anytime, anywhere, and on any device – prompting telco operators to embrace digital transformation in their operations and evolve their service offerings to deliver new, integrated experiences for consumers.

As such, telco operators like M1 no longer serve as just network service providers. The increasing demand for always-on connectivity, communication, and collaboration – from mobile and entertainment to daily needs such as online banking and shopping – has driven telco operators to double down on innovation to stay ahead.

Coupled with the rise of 5G networks, telco operators are now more challenged than ever to embark on digital transformation to deliver faster connectivity, immersive experiences, and differentiated services to its customers. For M1, this transformation is built on the cloud, which brought the scale M1 needed to serve an increasingly discerning customer base and allowed them to optimise the overall customer experience.

M1 has chosen Microsoft Singapore as a strategic partner to chart its evolution from an operator to a digital services provider, tapping on Microsoft Azure to power M1's systems. How will this partnership on the cloud support M1's digital transformation?

Nathan:
M1 utilised a software defined approach to the digital transformation, and we chose to build our digital platform in the cloud, so as to not face restraints and have access to scalability – we are able to scale up with demand or contract during market challenges, such as the current global pandemic.

Another key factor in moving to the cloud is the reliability, scalability, flexibility and performance M1 will now have, alongside insight to data analytics, without the worry of having to identify and procure additional infrastructure. With Azure Cloud, M1 has been able to simplify our architecture and consolidate multiple processes with easy customisation. It has ensured the quality and performance of our digital platform and has allowed for continuous growth as we move away from a premise approach. This allows us to focus on the needs of our business as we have the full support of a partner like Microsoft ensuring our infrastructure is always available.

George:
Singapore is one of the most competitive telco markets in the world. To stay ahead of the curve and keep pace with consumer and business needs, operators need to be at the forefront of innovation, and this is why

they embrace solutions such as Azure to power their digital transformation.

Through the power of the cloud, M1 can take the first step to its goal of becoming a digital service provider by offering a much wider range of digital services, and reduce costs by shifting to digital-first channels. It removes a massive proportion of capital expenditure and operational load, allowing M1 to have the flexibility and scalability to build go-to-market muscle and develop new digital services for its customers.

Today, we are 90% cloud native. We managed to consolidate 150 legacy applications down to only 30 applications to run the business. In addition, we were able to streamline over 200 databases to a single data lake, enabling real-time data analytics

What are the new capabilities of M1's digital platform?

Nathan:
Our digital transformation is enabled by a future-proof new technology stack which is able to integrate all aspects of our systems onto one digital platform. Working with some of the world's leading technology service providers, we were able to shift almost all aspects of M1's back-end system (barring physical network assets) to the cloud – a first in the telco industry.

Today, we are 90% cloud native. We managed to consolidate 150 legacy applications down to only 30 applications to run the business. In addition, we were able to streamline over 200 databases to a single data lake, enabling real-time data analytics.

With a strong technology platform as a foundation, we can continue to build new capabilities and develop innovative products for our customers. As we are now cloud native, our platform will continue to evolve naturally as updates from our tech solution partners will be integrated automatically, effectively and more frequently, removing the manual integration barriers caused by our previous legacy systems. This also makes it more cost effective in the long run as we do not need to invest in major system upgrades.

How will this transformation deliver value to consumers and industries?

Nathan:
M1's new digital platform will change and simplify the way we work and bring real value to our customers. The move to a cloud-based native platform will provide us tremendous agile business benefits and flexibility such as allowing us to drive changes in real time, match business demand, ease up integration with business partners as well as allow customers and partners to self-serve, and more.

With this back-end technological change, M1 will become even more relevant and accessible to our customers. With the ease and flexibility the platform offers, customers can move from queueing at the store to self-service and our customer support staff can effect changes immediately with a touch of a button. Our new digital platform improves customer experience as it streamlines our processes. By being cloud native, a lot of tasks can be simplified and fulfilled in real-time.

Today, consumers can do everything from paying bills, shopping for new devices and adding new services holistically and in real time – right from the palm of their hands. In fact, we have created over six million permutations and combinations to provide that ease of use to our customers. With our single data lake, we are also able to generate real-time data analytics and provide actionable insights to better serve our customers. Tapping on this technology also helps reduce human errors and boost customers' confidence when using M1's services.

George:
At Microsoft, we envision a world where operators can transition from costly and time-consuming investments of upgrading and maintaining complex technology, to one where they can free up resources to support the creation and innovation of new services for consumers and industries by leveraging the power of the cloud.

Through our partnerships and combined experience in telecommunications, Microsoft is accelerating M1's cloud adoption and powering a new suite of digital-first customer journeys. For instance, the integration of Openet's cloud-native solution on Azure will enable M1 to leverage real-time usage data and as a result offer its customers more personalized and seamless digital experiences across all touchpoints.

This partnership with M1 marks a new chapter in Microsoft's collaboration with the local telecommunications industry to unlock the power of 5G and bring cloud and edge closer than ever. The introduction of Microsoft's

technology to the operator's edge, coupled with our strong developer ecosystem, will help operators future proof their networks, reduce costs, and pave the way for new services and business models.

Through this transformation, M1 is now leveraging Microsoft's technology to innovate and derive new digital revenue models, products, and services for enterprises, which will in turn be able to do the same for their customers and industries they serve. This will also create further acceleration of the industry-wide transformation across telecommunications.

With the rise of 5G and IoT applications, as well as greater demand for digital connectivity, what is the role of technology in driving innovation for the telecommunications industry?

Nathan:
5G is a crucial milestone to enable an interconnected infrastructure that makes our spaces more efficient, convenient, safe and liveable. With 5G capabilities incorporated into devices and machines, it will drastically change the way we do things for both consumers and enterprises. At M1, we see 5G as more than connectivity infrastructure, but instead as a key driver of a digital future, and we look forward to exploring more 5G use-cases for B2B, B2G and B2C projects.

The rollout of the more secure and resilient 5G SA network in the next few weeks will allow us to tap into the full potential of 5G technology and open up a wider range of applications from cloud gaming to autonomous vehicles and remote surgery. Already, M1 has achieved a record of 15 5G live use cases and trials, putting us at the forefront of 5G development as we seek to continue stronger down this path.

Over the past two years, M1 has also been working closely with our key shareholder, Keppel Corporation, harnessing synergies to strengthen our propositions and creating more business solutions. Playing a crucial role in the larger Keppel ecosystem through leveraging our digital solutions and 5G network, we are able to enhance Keppel's suite of urbanisation solutions, including smart yards of the future, smart townships and buildings.

Understanding and recognising the potential that 5G brings, M1 is excited to see through the development of use cases alongside the development of the 5G network. Even as the network progresses, the technology will enable more services and new industry applications as well. M1 is committed to driving innovation and unleashing the capabilities of 5G to realise the vision of Singapore's next bound in the digital world.

George:
As we move into an era of intelligent cloud and intelligent edge that is driven by massive technology shifts in ubiquitous computing, ambient intelligence, and people-centered experiences, the telco industry has taken on a unique role in the realisation of 5G and next-generation digital experiences for consumers. With the rollout of 5G, service providers must also continue to evolve their workloads – including operations, network management, sales and marketing, customer care, and billing – to quickly define, deploy, and optimise new offerings that will realize the full business potential of 5G-enabled services. Operators can simplify these workloads, reduce costs, increase productivity, realise efficiencies, and increase organisational agility through intelligent processes and automation on a trusted and secure cloud.

Additionally, we believe that the use of technology can automate and accelerate not only the 5G core network, but also expand the reach of programmable networks, delivering new edge solutions that offer advancements in cost, speed, and security for operators. The rise of 5G will also open new frontiers for developers to unlock new use cases and create a next wave of edge applications to benefit end users. By infusing data, artificial intelligence and mixed reality into the cloud and powering it with 5G, we get an intelligent cloud and intelligent edge that presents tremendous potential for the industry to come together to provide real value to customers through enhanced digital services. In the long run, these partnerships will also drive the development of sustainable developer and commercial ecosystems, which will accelerate the delivery of exciting new capabilities at the edge, and spur continuous innovation for the telecommunications industry. TR

Through this transformation, M1 is now leveraging Microsoft's technology to innovate and derive new digital revenue models, products, and services for enterprises, which will in turn be able to do the same for their customers and industries they serve

Transiting to open RAN for next-generation operator networks

In the 5G era, networks must be flexible, scalable and agile. To support the evolving needs of digitalized economies, the industry is undergoing an overhaul, slowly transiting from legacy radio access networks (RAN) to open RAN as network operators aim to expedite cost-effective 5G network rollouts to expand networks and meet the surge in demand for connectivity to power future-ready networks.

Benefits of open RAN

Open RAN gives operators a greater degree of autonomy to manage their networks and the flexibility of choosing from different suppliers. This allows operators to mix and match RAN equipment to upgrade or expand networks more flexibly, as well as the ability to create networks that deliver optimized custom solutions to end customers with short time to market.

In an open vendor environment, operators are able to break away from vendor lock-in, as supplies can be sourced from several interoperable vendors. While this increases market competition, it introduces vendor competition to lower hardware and software costs, and hence lower total cost of ownership. Smaller players will also enter the market owing to lower barriers to entry. This contributes to a vendor ecosystem that is more diversified and vibrant.

RAN can be optimized with the introduction of intelligent RAN to leverage artificial intelligence (AI) and machine learning (ML). An open and virtualized RAN enables the disaggregation of software functionality and underlying hardware. A cloud-native approach with open RAN also allows remote management, which lowers costs of upgrades and maintenance. With the ability to host cloud network solutions, software updates can take place on the cloud to facilitate quicker turnaround for timely upgrades to help operators keep abreast with evolving market demands.

Challenges of deploying open RAN

Even though open RAN promises benefits aligned with the rise of 5G, operators may not be able to enjoy immediate perks in the short term as they continue to support existing 2G, 3G and 4G networks on RAN networks, at least in many countries in the Asia-Pacific (APAC) region.

With open RAN still in its infancy, operators face the challenge of ensuring interoperability and manageability to reap optimized end-to-end performance. Before open RAN becomes widely adopted, more testing will have to be carried out to ensure that products from multiple vendors work together seamlessly. Operators are tasked to perform verification to ensure interoperability between vendors before integrating products, potentially offsetting lower software and hardware costs in the first place.

Even so, open RAN has made encouraging strides in the past year as the industry has been advancing open RAN standards and specifications, carried out predominantly by the O-RAN ALLIANCE. Recognizing the importance of benchmarking and testing to help operators accelerate towards open RAN, the O-RAN ALLIANCE launched a minimal viable plan (MVP) earlier this year, specifying essential open RAN functions such as fronthaul, open hardware and cloud. In June, Google became one of the newest members to join the O-RAN ALLIANCE to accelerate open RAN initiatives.

Open RAN partnerships to grow the ecosystem

Globally, more operators are modernizing their networks by deploying open RAN. Last month, Deutsche Telekom (DT) switched on O-RAN Town in Neubrandenburg to deliver open RAN based 4G and 5G services. In one of the latest, Telecom Eqypt will be working on a proof-of-concept trial for open RAN solutions together with partners like Cisco and Altiostar.

According to the Dell'Oro group, open RAN investments grew by about five-fold year-on-year, with Asia-Pacific (APAC) fueling unprecedented growth in open RAN. Last year, Japan's Rakuten Mobile launched the first 5G open RAN network, with other operators such as NTT DOCOMO and KDDI now steering efforts towards open RAN deployments. With the shift intensifying, Rakuten Mobile recently announced strategic collaborations with NEC and Fujitsu to separately deliver open RAN solutions to the global market, with both partnerships focused on jointly developing 4G and 5G open RAN.

Moreover, Malaysia-based Axiata announced the first and only open RAN commercial pilots in Malaysia and Sri Lanka. To propel its open RAN ambition to boost an open network ecosystem, Axiata is working with partners like Mavenir, Parallel Wireless and Infosys.

To fully harness the benefits of open, intelligent and flexible networks, ecosystem stakeholders must work collaboratively to push forth a viable transition. Instead of waiting for open RAN solutions to mature, operators must take action now, rather than later, to participate in this evolution. TR

> Open RAN investments grew by about five-fold year-on-year, with Asia-Pacific (APAC) fueling unprecedented growth in open RAN

Jay Chen, Vice President, Asia Pacific Region, Huawei

Huawei: Advancing inclusive digital transformation in Asia Pacific

In an exclusive interview with Telecom Review Asia Pacific, Jay Chen, Vice President, Asia Pacific Region, Huawei, shares how innovation and policy priorities can reshape APAC's digital landscape and socio-economic trajectory.

COVID-19 has brought to sharp focus the importance of digital connectivity as societies face unprecedented disruptions and grapple with its devasting effects. With remote working and online learning becoming the new normal, digital connectivity has emerged as the lifeline to support the continuance of social and economic activities in a socially-distanced world. It is also indispensable in the context of pandemic response to facilitate the rapid dissemination of top-down information from governments regarding pandemic policies and regulations.

While no one is spared from the adverse effects of the pandemic, the hardest hit remains marginalized groups. For Jay, whose role includes leading Huawei to create shared social values in the region, it is clear that inclusion must be embedded at the heart of digital connectivity to ensure that no one is left out. In the words of Jay, "Digital inclusion is one of the most urgent and defining issues of our time."

Closing the digital divide in APAC

Studies have shown that a 1% increase in the digital ecosystem development index can yield a 0.13% growth in GDP per capita. In a post-pandemic era, digital inclusion promises a faster economic recovery. However, closing the digital gap in APAC can be an uphill task when those marginalized lack the infrastructure, access, or know-how to participate in a digital economy.

In the least developed countries, for instance, 17% of the rural population does not have mobile broadband coverage, while 19% of the rural population is only covered by 2G networks. Where coverage is available, high costs of an Internet-enabled device or Internet access are often the main barrier of entry, as reported by the Broadband Commission for Sustainable Development on the basis that mobile broadband subscription for at least 1.5 GB of data costs about four times more in developing countries than in developed countries. The lack of literacy and digital skills is yet another barrier to mobile Internet adoption for this group of underprivileged.

To bring meaningful change to this divide, Jay opined that technology must go hand in hand with sound policies. On top of improvements to infrastructure, governments are recommended to champion change through supportive top-down policies to facilitate technological progress that permeates every facet of society.

Regarding this, Jay explained that early investment into networks is essential for ensuring sustainable development in the long run. At the most basic level, regulators could consider making provision for all frequency bands to support a 5G-oriented evolution. Jay stressed the importance of allocating operators adequate key spectrum resources such as C-band and 700 MHz frequency to lay the foundation for optimal coverage and capability.

For the successful deployment of 5G and sustained development beyond 5G, the 6 GHz frequency – comparable to C-band in terms of performance and cost-effectiveness, as well as the last remaining mid-band possibly available for IMT in the future are crucial. In addition, research from Coleago Consulting found that operators should be allocated at least 1 GHz of additional mid-band spectrum to scale according to future 5G development.

"Early investment into networks is essential for ensuring sustainable development in the long run. At the most basic level, regulators could consider making provision for all frequency bands to support a 5G-oriented evolution"

With infrastructure being the foundation to connectivity, it's important to continually improve existing 4G infrastructure by expanding its coverage and increasing the penetration rate of this network. Accelerating VoLTE deployment in 4G networks should also be a priority to expedite the sunset of 2G/3G to 4G.

Within the industry, timely infrastructure deployment is important for efficient 5G roll out. Deployment processes should be simplified to reduce complex and lengthy processes. In areas where population density is lower, and commercial drivers of network investment are smaller, governments should extend public funding.

Finally, Internet-enabled devices and broadband Internet services should be made affordable to users to reduce the risk of increased marginalization in the region

With the pandemic fuelling a greater digital reliance, connectivity is no longer a luxury, but a necessity in our lives. In view of this global trend, Jay shared that digital inclusiveness is central to Huawei's vision to bring digital connectivity to every person, home and organization for a fully connected, intelligent world.

As a leading ICT solutions provider, Huawei partners with governments to provide policy support and with operators to develop optimized infrastructure to power next-generation connectivity. To greatly accelerate digital transformation and close the digital divide, Huawei leverages on technology and expertise in areas such as spectrum assignment, site and fiber passive infra openness and sharing. In India for instance, Huawei is supporting operators in enhancing network quality and increasing capacity to handle the surge in network traffic during the pandemic.

For instance, Huawei SingleRAN offers an open and simplified networking concept to help operators expedite 5G network deployment; CloudAIR allocates air interface resources on-demand, according to traffic demands or mobile user location; RuralStar Pro provides cost-effective and quick installation of base stations as well as provisioning of LTE and VoLTE in underserved areas; and Massive MIMO yields improved network coverage and enhanced user experiences. Through these solutions, Huawei assists governments and operators in rolling out optimised, affordable, and hence, inclusive networks.

Digital transformation founded on R&D, innovation and talent-building

According to the Asia Economic Integration Report 2021, accelerated digital transformation in Asia will generate an annual economic dividend of more than $1.7 trillion, or the equivalent of more than $8.6 trillion over the 5 years to 2025, creating 65 million new jobs each year.

However, the rapid development reveals an imminent ICT talent deficient in the region that will impede growth if not addressed.

Moreover, the digital landscape varies vastly from country to country in the APAC region, as reported in Huawei's Global Connectivity Index (GCI) 2020 findings, which categorizes countries' digital economy journeys according to their ICT investment, ICT maturity, and digital economic performance.

With digitalization shaping economies and ICT becoming integral to most sectors, Huawei recognizes that the APAC region

> With supportive policy of spectrum assignment, site and fiber passive infra openness and sharing, Huawei is committed to continuously cooperating with regulators, operators and industrial partners to build national digital infrastructure, connect the unconnected, explore new possibilities, and bring digital to every person, home and organization for a fully connected, intelligent world.

presents its set of unique challenges and opportunities.

"Inclusive digital transformation relies on collaborations with industry stakeholders and convergence of emerging technologies. Huawei undertakes a multi-faceted approach toward spearheading progress, working with both upstream and downstream partners to build a holistic ecosystem focused on research and development, innovation, and talent-building," Jay explained.

Every year, Huawei invests over 10% of its revenue into R&D to bring added value to its partners worldwide. In the APAC region specifically, Huawei has built 8 research centers and labs in countries like Hong Kong, Singapore, India, and Thailand.

Committed to achieving shared success and joint innovation, Huawei is vested in ecosystem-building with strategic partners. Broadly, this ecosystem can be categorized into Startup, 5G, and Handphone Mobile Services (HMS).

Driven by the Huawei Spark program launched last year, the Startup ecosystem aims to accelerate tech start-up growth in the region. Through this program, Huawei provides cloud and AI technical and consulting support, as well as funding and mentorship.

In the 5G ecosystem, for instance, Huawei developed a 5G Ecosystem Innovation Center with the Thai government last year to fast-track the development of digital innovations for 5G applications and services across various industries. It will also incubate about 100 local SMEs within 3 years. Efforts as such aim to greatly enrich the local 5G ecosystem and expedite digital progress.

Finally, the HMS ecosystem comprises initiatives such as Huawei's APAC DIGIX Lab in Singapore. Launched this year, the DIGIX Lab leverages Singapore's position as a growing technological hub to spur mobile app development in the APAC region.

To address a potential talent gap, Huawei is vested in nurturing national digital talent ecosystems. Having debuted in 2008 for young students in Thailand, Huawei's Seeds for the Future program has since expanded to benefit more than 5,000 students in 90 universities across 15 countries. Huawei has also established regional training centers and ASEAN academies, and forged partnerships with the public sector in countries such as Thailand, Indonesia, Singapore, and Malaysia, as well as 159 universities on talent development programs. More recently, at the Digital Talent Regional Summit, Huawei has committed to grooming digital talent in Bangladesh, Nepal, and Sri Lanka. Collectively, Huawei will help cultivate more than 300,000 ICT talents in the APAC region within the next 5 years.

Unleash full 5G potential with Huawei

Huawei commenced on 5G research as early as 2009, with investments totaling US$4 billion to date. Having invested early and heavily into 5G, Huawei is at the forefront of innovative 5G end-to-end enterprise products and solutions, designed based on insights into partners' unique needs.

For example, Huawei launched the industry's lightest TDD Massive MIMO product this year to benefit 80% of commercial 5G networks using TDD Massive MIMO technology. Weighing just 19 kg, the module can be carried and installed by just one person to greatly improve network deployment efficiency. And in Europe, where FDD has been used to build 5G networks, Huawei innovates with the industry's only commercial FDD Massive MIMO product.

Through heavy investments and continuous innovations, Huawei has helped global operators build differentiated networks that deliver the best experience, but are yet easier to operate, more cost-effective, and simpler to deploy to reap greater returns on 5G investments. Just last year, Huawei delivered over 100 5G networks worldwide.

Across industries, Huawei achieves joint creation and shared success through partnerships on diverse 5G applications across verticals. In Thailand for example, Huawei has partnered with the public healthcare sector to pilot unmanned vehicles, leveraging 5G to deliver medical supplies, among other use cases.

In alignment with Huawei's commitment to provide continuous support to societies, Jay concluded that the Chinese giant will continue to engage and work with both regional public and private stakeholders to advance both technologies and industries during and after the pandemic to drive social-economic progress and digital transformation. TR

How Asia-Pacific countries are gearing up for Agriculture 4.0

Before the pandemic, the World Health Organisation (WHO) has warned about worsening food scarcity as the world's population grows in the next few decades. Following the COVID-19 outbreak, the United Nations reported that the severity of a food scarcity has been brought forward – doubling in numbers in the Asia-Pacific region to affect more than 265 million last year.

After experiencing a bout of food supply chain disruptions last year, countries are jolted to the need to build food resilience to prevent a food crisis. This has spurred renewed interests in the future of food, with governments and enterprises more eager to explore 5G for precision agriculture to power communication between IoT devices on farms.

AI and IoT to revolutionize farming

According to Markets and Markets, AI and IoT for farming is a growing market that will reach US$22 billion by 2025, up from US$13.8 billion in 2020. It is also predicted by AgThentic in a recent report that IoT devices in

agriculture will increase from just 30 million in 2015 to 75 million in 2022.

As 5G networks roll out in more countries, farmers can benefit from higher-connectivity sensors that utilize AI and IoT to monitor soil and control conditions such as water usage to optimize farm yield for crops. Using AI, drones capture high-resolution images for real-time analysis of insect infestations, weeds and even nutrients deficiencies. Data collected can then be deposited on the cloud and analysed for the most optimal conditions for any crops. The result is better crop yields and high quality produce.

The promise of autonomous tractors to sow seeds on farms is another advancement that revolutionizes farming and helps reduce manpower. On livestock farms, geolocation services can be used to help farmers locate and monitor livestock, to help track livestock throughout the supply chain. Geo-tagging on livestock can also capture health data for its entire lifespan, using blockchain to ensure traceability.

However, owing to a lack of 5G networks or coverage, most countries in the Asia-Pacific region are still relying on 4G for farming – that is if smart technologies are deployed at all. For these countries, it would be some time before 5G networks become available in the country or extend to the rural areas. In the meantime, countries in the region are gearing up for major shifts in the industry in anticipation of the future of farming.

China

China has 20% of the world's population, but only 7% of its land is arable. To ensure food security, farms must be revolutionized to help increase yields. Leading the world in 5G deployments, China is experiencing a shift towards digitalization on farms, using innovative techniques like drone and satellite imagery, as well as pattern modelling to improve yield.

In Zhejiang, for instance, China Mobile's 5G network is used in smart greenhouses to set the ideal temperature, lighting, humidity, and fertilizer levels. Data is sent in real-time over the 5G network to ensure accuracy in settings, complete with control systems against pests' diseases that can be managed remotely.

Farmers can also leverage new technologies to ensure food traceability, using QR codes to help consumers learn about the product's harvest location and date.

South Korea

The first to roll out 5G in the world, South Korea introduced 5G to smart farming to the world's first 5G village in 2019. Powered by KT's 5G network, this 5G village in the Demilitarized Zone features smart farming. To expand on this capability, South Korea's ICT ministry announced plans earlier this year to invest US$353.3 million to develop smart farms over the course of the next seven years.

Thailand

Thailand, a major food exporter where about 40% of the country's labour force works in the agriculture sector, is one of the first countries in Southeast Asia to adopt smart farming in line with the nation's Thailand 4.0 ambition. However, 5G coverage is mostly concentrated in its capital, with little presence in the rural areas.

Japan

Smart agriculture is the solution to Japan's problem of declining farmers, where the number of farmers will dwindle from 2.08 million in 2015 to 1.31 million in 2030. To promote smart agriculture, the government of Japan has launched WAGRI, a platform for agricultural data for ICT vendors and agricultural equipment manufacturers to tap onto its rich resource to develop solutions. Last year, KDDI introduced a 5G service from just below US$10 a month to support smart farms.

Malaysia

In Malaysia, where the agriculture sector accounts for between 7% and 12% of the country's gross domestic product, the pandemic resulted in an estimated loss of income of US$120 million in 2020. With aims to modernize the agriculture sector and bring it up to speed with Industry 4.0, the Malaysian Agricultural Research and Development Institute (MARDI) started tapping on Maxis' NB-IoT network to carry out precision agriculture to enable systematic sensing of environmental and soil conditions remotely. The network is capable of supporting millions of connected sensors without consuming a lot of power. Separately, Celcom started partnering a drone maker to co-develop 5G drones for farms last year.

Philippines

The government plans to inject new blood into the agriculture sector by attracting the youth. Under the nation's Agriculture 4.0 vision, the sector will embrace high-tech technology, using blockchain, nanotechnology and genetic modification to replace otherwise traditional farming techniques. Last year, South Korea announced that it would fund joint smart agriculture projects amounting to US$2.7 million in several parts of the Philippines.

Australia

As the sixth largest producer of food in the world, Australia's agriculture accounts for 12% of the country's GDP. Innovative pest control is just one area that the country can benefit from given that pests cause Australian farmers AU$1 billion in losses each year, as reported by the Commonwealth Scientific and Industrial Research Organisation, a government agency in Australia. To grow the sector, the Australian government has committed to set aside US$72 for smart farming by 2030.

Technological innovation is key to ensuring food security. In the coming years, we can expect more investments to be poured into an area like 5G to promote agriculture digitalization to help countries harness the full benefits of smart farming. TR

ZTE: Delivering data center efficiently to help build a digital economy

From June 17 to 19, 2021, China Data Center Working Group and Green Energy Technology Alliance for the Data Center jointly hosted the 2021 China Data Center Green Energy Conference which solemnly opened in the new Shanghai International Expo Center. Under the themed "Innovative, energy-efficient, and low-carbon future," ZTE proposed its efficient Data Center Delivery Solution, demonstrating the end-to-end delivery capability covering the full life cycle.

"With over 30 years of experience in telecommunication network construction, ZTE has established an end-to-end engineering service capability system worldwide to provide professional and efficient services for customers," said Zhang Dayong, vice president of ZTE.

"With years of experience in large-scale data center delivery worldwide, ZTE can provide full life cycle services from consultation, planning and design, and delivery to operation and maintenance management. Through continuous R&D, the whole PUE (Power Usage Effectiveness) has been reduced to below 1.3 in

ZTE Data Center Construction Experience

the prefabricated fully-modular Data Center field, and large-scale commercial deployment has been realized. ZTE is a reliable data center partner in the industry."

Starting from 2009, ZTE's data center was one of the first wave of enterprises in the data center field. In 2014, ZTE built the largest single micro-modular data center in Asia located in Pingshan, Shenzhen, China, and began to lead the industry trend. By 2016, ZTE had built dual-uptime Tier IV certified national standard data centers with reliability exceeding 99.995% for Bangladesh. In 2017, ZTE implemented the application of indirect evaporation cooling air conditioners and deployed the storage fully-modular data center for the first time.

After years of technological accumulation, the prefabricated fully-modular data centers were deployed on a large scale for the first time in the industry, and will be deployed abroad. The first large-scale edge data center will be built in Philippines. With excellent delivery quality and speed, ZTE exclusive solution won the bid for 10 core and convergence equipment rooms (100% share). In 2021, ZTE won the bid for the centralized procurement of fully-modular data centers by being the top internet enterprises in China with the maximum share, leading in-depth transformation in the data center industry solution.

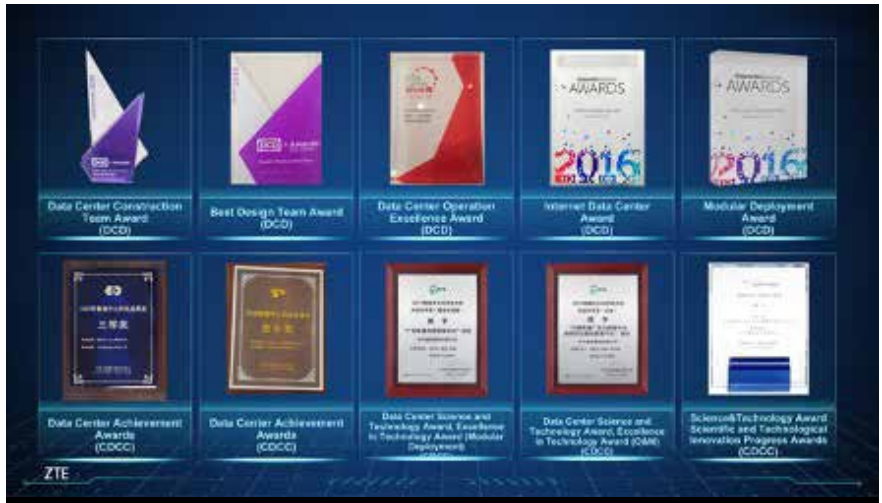
"ZTE has a professional data center architect team, which can provide customized and integrated solutions on demand. In addition, ZTE cooperates with international first-class design institutes, and applies professional 3D modeling tool, BIM (Building Information Modeling), for precise design to avoid risks in equipment installation and construction in advance, and relies on the integrated global supply chain platform to effectively reduce the lead time," said Zhang Dayong.

"ZTE's professional delivery team has fully adopted the end-to-end digital project management and control platform, and has helped improve engineering management efficiency by 40% through refined project management. With ZTE self-developed platform, iDCIM (intelligent Data Center Infrastructure Management), ZTE can optimize the energy efficiency of the data center in the full life cycle based on the AI algorithm, and improve the energy efficiency above 8%. Meanwhile, intelligent O&M methodologies, such as robot preventive maintenance, can improve the O&M efficiency. "

Up to now, ZTE has over 300 success cases worldwide, and has accumulated over 1,100,000 square meters in construction and more than 100,000 cabinets deployment experience. In addition, ZTE has won over 40 awards in China and overseas, fully demonstrating ZTE's increasing technical strength and brand influence in the data center field from design, deployment and O&M management.

"As the leader in the data center industry, ZTE has been working for 12 years in this field, continuously assisting the data center industry in building the new infrastructure plan, and becoming a reliable partner of customers," said Zhang Dayong.

"In the future, ZTE will continue to forge ahead in various aspects such as prefabricated, fully modular, and end-to-end solutions, and continuously innovate to build a 'green, reliable, fast, and intelligent' data center for customers. In this way, we can build a digital economy together with customers." TR



ZTE Data Center Awards

Hyperconnectivity: The essential building block of a smart city

We are now living in an age of increasing technological innovation. You could even say that we are experiencing a technological renaissance as more people and businesses are adopting advanced technologies at unprecedented rates. However, they are also doing it faster than many cities – especially those within Asia-Pacific.

As we inch ever closer to Industry 4.0, it is now time for urban leaders to apply innovative technologies to solve age-old urban challenges which came to the fore due to the ongoing COVID-19 pandemic. However, they must do so by not purely focusing on digital transformation for its own sake, but to use it to generate scalable, real-world outcomes for cities.

The primary lesson the pandemic taught us over the past year is that sustainability should be the underpinning factor of making cities smarter. However, it is a lesson that builds on top of other pressing concerns that were already mounting – namely high population growth, the straining of the environment and growing income disparities.

To sustainably create smart cities that can help alleviate such challenges, cities must first reach a level of hyperconnected maturity. What degree of preparedness are Asian cities currently at in their hyperconnected city development?

What is a hyperconnected city?

Essentially, a hyperconnected city can unlock meaningful economic, business, and social values by leveraging technology to transform and securely interconnect critical areas of its urban ecosystem for its citizens. It goes beyond the more conventional concept of smart city development, as a hyperconnected city focuses on the application of technology, while connecting governments, businesses, academia and citizens to improve the delivery of smart services. It is via the alignment of all four components that cities can realize their fullest socio-economic and environmental benefits.

But how can we evaluate the strength of connections between the four components in a city, and what are these four components? According to the Building a Hyperconnected City report which we worked on in collaboration with ESI ThoughtLab, connectivity must be assessed by the following four pillars of city transformation: technology, data and analytics, cybersecurity, and connected citizens.

Based on the four pillars, we have identified that Asia-Pacific currently has 20 cities that can be classified as being hyperconnected. While each city has reached some level of connectivity between the pillars, they still vary according to their maturity stage.

The full technological embrace of IoT

Hyperconnected cities are widening their use of advanced technologies across their respective urban ecosystems. Currently, the above mentioned 20 cities are boosting this adoption by improving their IT infrastructure, data collection and analytics, telecommunications and mobility solutions to drive overall transformation.

One technology in particular is the Internet of Things (IoT) and its adoption by cities in Asia – both in developed and developing markets – aimed at sustaining urban growth, especially since populations are rising and more people are living in cities than ever before. Urban sustainability is crucial to creating healthy and safe places for people to live and work, and IoT can help cities make the best use of digital opportunities that can improve the usage of current (and future) urban infrastructure.

One instance of how this is happening is in Seoul, where the city has been deploying IoT-enabled sensors to measure traffic and air quality, and is looking to deploy 50,000 more IoT sensors by 2022 for city-wide operations. Down under in Australia, the city of Melbourne has turned itself into a testbed for emerging technologies – notably in the areas of IoT and 5G to realize new use cases in fields such as telehealth, intelligent transport systems, traffic management, and pollution.

These are just two examples of how hyperconnected cities are leveraging IoT in their urban transformation, but all the surveyed countries in Asia plan to accelerate their IoT development over the next three years. It is one of the top priorities for them, since IoT will be used to capture and generate actionable data to further improve urban management.

Powering smarter cities via data

Hyperconnected cities use advancements like IoT to draw on a wide variety of data to provide value to urban stakeholders. This includes both traditional data, i.e., those gleaned from city departments, local businesses, and citizen surveys – to new types of data, i.e., from IoT sensors, artificial intelligence (AI), and even social media.

By synergistically using both advanced technologies and actionable data from multiple sources, hyperconnected cities can improve urban management and sustainability. For instance, most of the cities we surveyed are already using data to manage IT infrastructure and telecommunications, while half are using it for financial services and systems, mobility and transportation, as well as security (both physical and digital). Meanwhile, a third of them are using data for public safety, health, and wellness.

Tokyo is exemplifying how this is being done in Asia. As Japan's capital city moves towards helping the nation realize its Society 5.0 ambitions, it is improving urban management in critical urban spots, with a particular focus on energy and environmental sustainability. The city – largely due to COVID-19 – is also preparing its society and economy for business continuity (during crises). In line with such efforts, data is being used to model grand designs and concepts of urban data infrastructure, which could then be used to launch pilot experiments in sustainability and urban management.

Jakarta – which contains Southeast Asia's largest urban population – is also pushing for greater data collection throughout the city. It is doing so by focusing on real-time analysis, integration, and application of data for urban planning and management, especially in the areas of transportation and environmental sustainability.

Hyperconnected cities can generate greater ROIs

Beyond addressing direct urban sustainability challenges, urban leaders are also pressed to make the best use of smart city investments to increase their ROIs. We believe that to be hyperconnected, a smart city must be one that is on track to generate tangible returns to realize business, economic, financial, societal, and environmental benefits.

However, cities must also understand which specific areas of investment can generate the greatest ROI. Based on research, governance projects are the ones offering cities the highest return across the main areas of an urban ecosystem. To illustrate, especially in the area of e-governance, cities that are just beginning to implement hyperconnected solutions see an average ROI of 2.6%, whereas leading cities, which have more mature implementations, see a 5.6% ROI on average. Conversely, it is no surprise that the hyperconnected cities in our survey are also the ones with the most e-services offerings and programs to positively impact the urban living experience. We observed that – as cities become more hyperconnected – the network effect multiplies the results.

Bangkok is one city that seeks to draw in more high-value investments via the national Thailand 4.0 roadmap. This includes improving urban infrastructure in terms of public services, transportation, and environmental management. The city also brought the country's healthcare to the future when 5G-based telehealth services were rolled out during the early months of the pandemic. While its primary aim was to support overburdened front liners, and healthcare facilities, the move has also fostered innovation in the overall healthcare sector, which private healthcare stakeholders can leverage to cement their country's regional leadership in the industry.

Investing more in smart city solutions to boost foreign direct investment (FDI) is also gaining traction in Asia's emerging markets. For example, in Vietnam – already a leader in Asia's 5G race – the country's leading business hub of Ho Chi Minh City has already made 5G commercial networks available to industry. 5G is an important component for Vietnam's continued economic growth and FDI in manufacturing, and its investments are starting to pay off.

Urban stakeholders must play the long, more valuable game

We are now closer than ever to entering a world of smart and hyperconnected cities. However, urban leaders must exercise patience; they will be faced with integrating complex infrastructure, multiple platforms, the need for different types of data, and customized applications.

But more crucially – and this applies to all cities, no matter what stage they are at in their smart city development – urban leaders must ensure continued citizen and stakeholder support. Making a noticeable improvement in the lives of citizens is a fundamental element in the creation of any smart city roadmap. TR

By Idris Vasi, head of sales, Nokia Cloud and Network Services, Asia-Pacific & Japan

To be hyperconnected, a smart city must be one that is on track to generate tangible returns to realize business, economic, financial, societal, and environmental benefits

Axiata expands network leadership with commercialise Open RAN across Asia

Axiata Group Berhad (Axiata) has embarked on an network transformation program, leveraging Open Radio Access Networks (Open RAN) as a key technology for mobile networks designed to narrow the digital divide and enhance rural connectivity across Asia.

Eyeing large scale commercial deployments by year end, the Group has successfully conducted Open RAN commercial field pilots in Malaysia, Indonesia, and Sri Lanka through strategic partnerships with leading global network solutions providers Mavenir and Parallel Wireless and supported by Infosys as systems integrator (SI).

Through its strategic partnership with Mavenir, the industry's end to end network software provider, Axiata has deployed the MAVair Open vRAN solution including all G Open RAN, Packet Core and Mobile Network applications at selected sites, in Malaysia, Indonesia and Sri Lanka. To simulate non-ideal backhaul conditions, especially for rural areas, the sites selected are connected with non-ideal backhaul (microwave links), and in some cases satellite, making this the first satellite backhaul powered Open vRAN sites in the world.

During the testing phase, Axiata was also able to achieve the first live commercial service integration of the Telecom Infra Project (TIP)'s Evenstar 4G Radio through Mavenir's MAVair O-RAN based solution for Open RAN. Axiata is a participant of the TIP initiative in which a global community of companies and organisations are working together to accelerate the development and deployment of open, disaggregated and standards-based technology solutions that deliver high quality, low cost connectivity.

Axiata's commercial pilot also encompassed a collaboration with Parallel Wireless, the US- based Open RAN company delivering all G, cloud-native Open RAN solutions. Axiata successfully demonstrated commercial deployment of 2G and 4G Open RAN connectivity within its network in Sri Lanka which is operated by Dialog Axiata.

M1 partners Samsung to be world's first to support voice over 5G New Radio (VoNR) on 5G SA network

M1 Limited (M1) and Samsung achieved a significant milestone in advancing the world's 5G ecosystem by making available Voice over 5G New Radio (VoNR) on M1's 5G Standalone (SA) network.

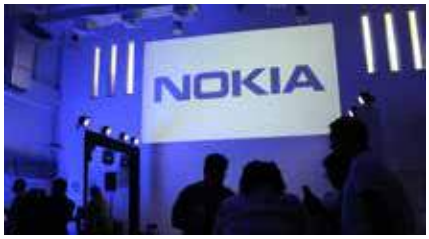
Tapping on Samsung's expertise in 5G leadership, coupled with M1's strong engineering team and proven track records in the development of 5G SA use cases and trials, M1 and Samsung successfully achieved the deployment of VoNR service on M1's 5G SA network. This partnership validates end-to-end 5G VoNR interoperability – a first in the world, which marks a significant step towards the future of 5G voice services.

The VoNR call service fully utilises the SA architecture of 5G network for an improved high definition quality call experience, while providing 5G speeds for data-driven activities throughout the duration of the voice calls In comparison to calls made on the 5G non-standalone (NSA) network, which rides on existing 4G networks, the VoNR service boasts faster call setup time and seamless voice call continuity. M1 customers will be able to enjoy the benefits of VoNR service as M1 gears up for its 5G SA market trial launch on the 27th of July.

In addition, VoNR service will open up numerous 5G SA-enabled data services and provide the baseline for quality video conferencing or augmented and virtual reality features, offering a glimpse into the plethora of connectivity solutions 5G SA will enable M1 to bring.

Samsung Galaxy S21 Ultra, S21+ and S21 customers on M1 network will be amongst the first in the world to enjoy the benefits of the VoNR network via an over-the-air software update on M1's 5G Booster Plan. Customers can also look forward to seamless connectivity with an ultra-fast data speed rate that is almost five times faster than 4G. Furthermore, paired with Samsung's 5G compatible devices, multi-tasking is possible with remarkable productivity improvement.

Nokia and TPG Telecom switched on first 5G SA on 700MHz spectrum band



Nokia and TPG Telecom announced that they have switched on a live 5G standalone (SA) network in Australia on the 700MHz spectrum band – the first time this has happened in the world. Low band 5G coverage at 700MHz, which is the lowest 5G frequency band deployed in Australia with the largest range, will enable TPG Telecom to provide wide outdoor 5G services, as well as deep indoor 5G coverage in urban and suburban areas to its customers.

Under the partnership, Nokia is supplying equipment from its latest ReefShark based AirScale product range including its unique triple band remote radio unit that supports 700, 850 and 900 MHz bands. The unit also supports 3G, 4G and 5G simultaneously across all TPG Telecom's low-band frequencies. TPG Telecom's 5G SA service is now successfully activated in parts of Sydney and this means that the operator's customers will benefit from having 5G available in more places.

Low band 5G goes further outdoor and deeper into buildings than existing 5G deployments and will allow operators like TPG Telecom to bring 5G to even more customers.

Barry Kezik, Executive General Manager Mobile and Fixed Networks at TPG Telecom, said: "We're excited to be the first network in the world to realise the true potential of low band 5G SA at 700MHz. TPG Telecom's low band 5G will expand our 5G coverage, supporting our goal of reaching 85% of the population in Australia's top six cities by the end of the year and changing the way people and things connect to the TPG Telecom 5G network."

Dr Robert Joyce, Chief Technology Officer at Nokia Oceania, said: "Nokia is proud to support another 5G world first. We have a long-standing partnership with TPG Telecom, and we have jointly developed our unique triple band radio solution specifically for them. Today we get to see the result of that joint effort and collaboration which will deliver premium wide area 5G SA coverage for TPG Telecom and its customers."

Telenor partners Oracle to monetize fast-growing mobile services

Mobile services, from voice to video streaming, are on the rise across Asia. To support this growth, Telenor selected Oracle Communications Billing and Revenue Management, including Oracle Converged Charging to lay the groundwork for 5G and provide seamless charging and billing interactions for its 175 million subscribers in the region. This can range from an ongoing monthly subscription to a video on-demand service to mobile banking payments to large scale prepaid voice and data services.

Oracle Communications Consulting is leading the implementation and will deploy the solution in Malaysia, Thailand and Pakistan. Telenor is expanding its territorial coverage globally to improve the wireless experience for its customers. The company is focused on three key initiatives: digitalizing its technical stack to be ready for 5G, innovating its operating model with more touch-free operations, and transforming how it works internally and with partners to deliver more value while containing capital expenditures.

Oracle's fully integrated, cloud native digital billing and charging solution gives Telenor proven monetization and real-time rating capabilities to support any payment model such as prepaid, postpaid or hybrid, and any business model, including business-to-business or business-to-consumer account structures. By selecting billing and charging from a single provider, Telenor will benefit from quicker implementation and streamlined processes to create new offers and provision customers and groups without needing to manage the risk of out-of-sync revenue systems.

In addition to competitive pricing and revenue management, Oracle's cloud native converged charging solution has been validated in rigorous performance testing on Oracle Cloud Infrastructure. It scales to very high subscriber volumes with low millisecond latency, near-linear scalability, and efficient resource utilization, all with real-world prepaid and postpaid charging scenarios.

Rakuten Viber chosen by Dialog Axiata to become Sri Lanka's largest mobile operator A2P partner

Leading messaging app Rakuten Viber and Sri Lanka's Dialog Axiata PLC announced their recent official partnership. After years of cooperation on the international voice business, Rakuten Viber was chosen as an international Application-to-Person (A2P) messaging platform for the country's largest mobile network operator.

The partnership will enable more than 300 Rakuten Viber carrier partners to comfortably communicate with more than 16 million Dialog Axiata customers using the Rakuten Viber A2P bilateral service.

Matan Barth, Senior Director of Telecom Services at Rakuten Viber, said: "This partnership is a very important step for Rakuten Viber and our continued efforts to expand the company presence and footprint in the APAC region. Our telecom partners will surely benefit from the new A2P communication channel we offer with Dialog Axiata to Sri Lanka."

Ravi Sankar Vaddi, Senior Consultant - International Business and Enterprise Data at Dialog Axiata PLC, stated: "Rakuten Viber is one of the most popular messaging apps and has a very strong position in the market. Having their own developed infrastructure and a large presence in A2P messaging, Viber provides us with a high-quality A2P SMS traffic exchange. This allows Dialog's subscribers and clients to benefit from superior and assured connectivity, as their messaging experience becomes more seamless."

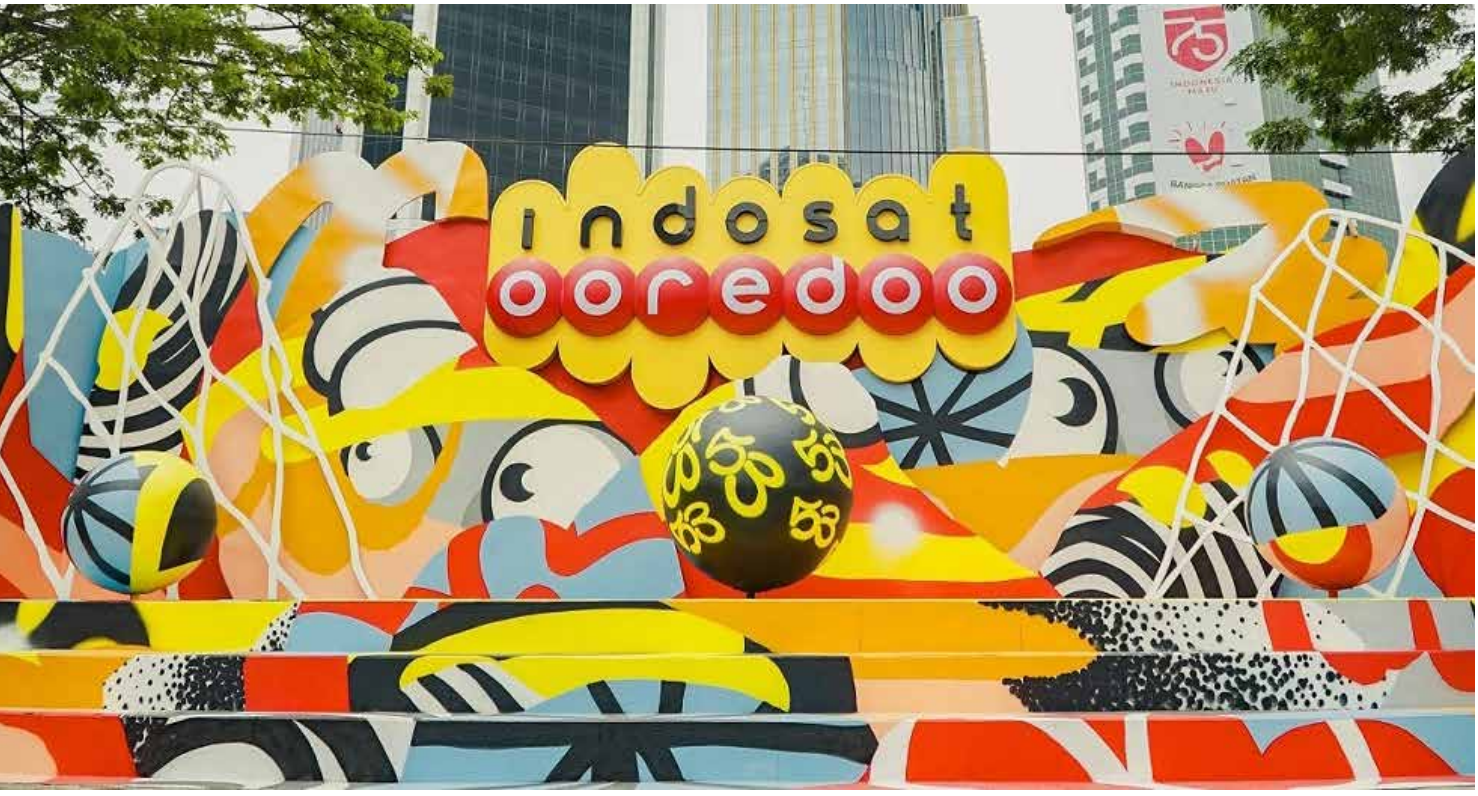
SLA Digital partners Malaysia's U Mobile for carrier billing

SLA Digital has partnered with Malaysian Mobile Operator U Mobile to bring more digital content to their subscribers through carrier billing. U Mobile's customers will gain access to new services, with the ability to seamlessly charge purchases directly to their U Mobile phone bill or prepaid credit.

SLA Digital is pleased to add U Mobile as another carrier billing offering for their merchants, in addition to their other mobile operator partners in Malaysia. The announcement means SLA Digital is now in the position to offer merchants greater access to more mobile subscribers in Malaysia, helping them accelerate revenues with a seamless and secure mobile payment option.

Kevin Drayne, CEO at SLA Digital said "We continue to expand our mobile operator connections at SLA Digital throughout Asia and we are very pleased to introduce U Mobile as our latest mobile operator partner in Malaysia. We look forward to helping U Mobile drive new revenues through carrier billing while extending opportunities for global merchants in this region."

SLA Digital will continue to roll out new services with U Mobile through subscriptions, one-off payments and in-app purchases with carrier billing.



Comviva's customer value management platform drives breakthrough growth for Indosat Ooredoo

Fueled by an intensely competitive operating environment in Indonesia's mobile sector, Indosat Ooredoo partnered with Comviva in delivering a front-to-end real-time marketing management platform, as well as subscribers' loyalty and rewards program to yield increased customer retention and revenue within months from implementation.

In a country where 98% of mobile phone users fall back on prepaid subscriptions, telecommunications operators in Indonesia's competitive mobile market face the gargantuan challenge of retaining customers. In a heterogeneous market already characterized by low loyalty and high churn rates, matters are made worst when high costs deter telecommunications operators from reaching out to and acquiring new subscribers in under-served populations in far-flung areas.

Indosat Ooredoo taps on Comviva's expertise in innovation-driven growth marketing

It is costlier to replace churned customers than retaining them. Amid intense competition and dismal financials, Indosat Ooredoo recognized that the path to profitable growth is an improved customer value management (CVM) platform that manages customer lifecycle holistically to uncover customer insights and drive meaningful engagements.

Having collaborated on other deployments with much success, Indosat appointed Comviva, a global leader in mobile solutions for telecommunication operators, as a strategic partner to spearhead its Big Data CVM 2.0 program in April 2019.

> On the success of the programme, **Eduardo Quiroga, Senior Vice President – CVM and Big Data, Indosat Ooredoo** said, "Our partnership with Comviva has enabled us to empower our customers on their digital journey, and improve customer satisfaction and retention through personalized customer offers and interactions. Not only does it enable a better experience for our customers, but also helps generate significant incremental revenue for Indosat."

Aimed at improving customer lifetime value to achieve incremental revenue, Comviva developed a three-year digital roadmap with front-to-end digital strategies. The suite of solutions spans different stages from implementing, operating, optimizing and providing timely, in-depth post-implementation analysis to transforming customer experiences critical to the success of the program.

Overcoming key challenges with technology

Before partnering with Comviva, Indosat Ooredoo was missing out on opportunities to influence customers' micro-moments at critical junctures in the customer journey. To maximize the value of individual customers and micro-moments of interactions, Comviva's first step was adding real-time capabilities to the operator's CVM platform.

A machine learning (ML), real-time interaction management platform, Comviva's MobiLytixTM Real Time Marketing capitalizes on actionable analytics to steer CVM excellence. It integrates data across multiple sources to build intelligence and act on real-time events to orchestrate engagements with customers.

Adding complexity to critical decision-making was the lack of federated data across Indosat Ooredoo's various departments. To get to the root of this problem, Comviva developed a big data Hadoop-based centralized management system that effectively captures over 800 attributes about Indosat Ooredoo's prepaid and post-paid subscribers to create a single view of its subscribers. This system brings focus to descriptive, predictive and prescriptive attributes of subscribers to serve as a unified customer data system accessible to the operator's campaign management, business and applications teams.

Comviva also identified the absence of a pervasive artificial intelligence (AI) technology to measure campaign effectiveness as another shortfall. To this end, Comviva developed models founded on AI and ML to accurately predict customers' behaviors.

Finally, Indosat introduced imPoin, a loyalty and rewards program to extend instant gratification to loyal customers and reward loyal customers preferentially. Powered by Comiva's MobiLytixTM Loyalty and Rewards Platform, this program allows Indosat Ooredoo to predict customer engagement activities and positively influence customer behavior through reward-based engagements. To yield the best outcomes, a framework was developed to measure, monitor, and optimize the program.

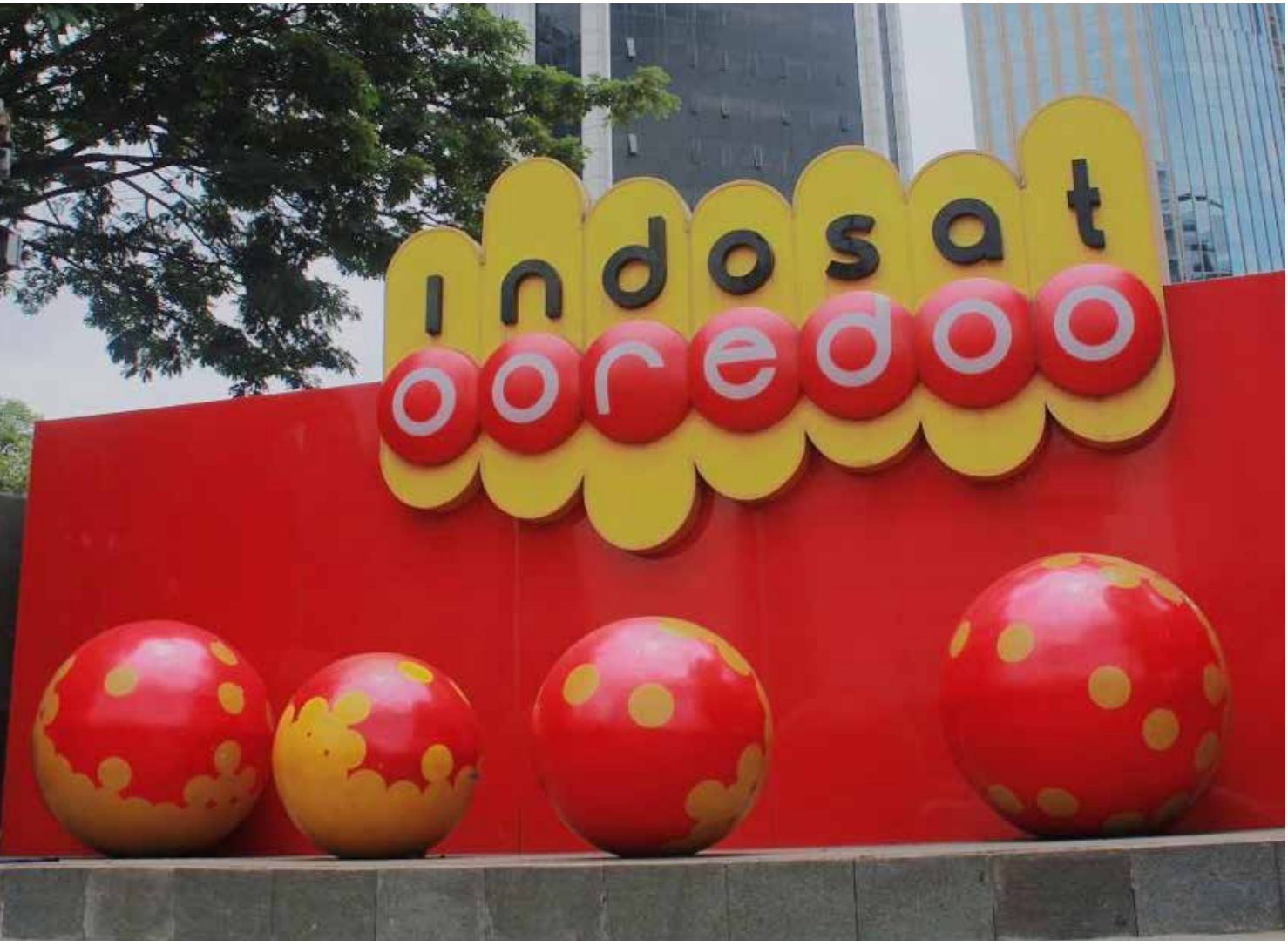
Comprising a 4-tier membership model – namely Red, Silver, Gold and Platinum, with Platinum being the highest tier – better benefits are rolled out for higher tiers. Members are motivated to earn benefits for all their engagements, which can be accumulated and redeemed via the myIM3 mobile app. Members can look forward to receiving a mix of lifestyle and experiential rewards such as fuel, shopping, dining as well as gaming vouchers.

Comviva led breakthrough for Indosat

Leveraging on AI, ML and customer analytics record (CAR) solutions, Comviva's MobiLytixTM real time marketing platform reaped stellar improvements for Indosat Ooredoo's numbers by the next quarter.

Comviva successfully delivered personalized customer contact to millions of customers, resulting in a 30-35% hike in offer conversion rate.

> **David Peters, Senior VP and Head of South East Asia and ANZ Region at Comviva** said, "Comviva has designed its next-generation analytics platform MobiLytix™ keeping in mind the challenges of its telecom operator partners. We are excited to partner with Indosat Ooredoo to support their digital transformation journey and provide great experiences for their customers. "



Within three months of migration to Comviva's real-time CVM platform, Indosat has seen significant improvements in revenue and churn management, with a 3.5X increase in revenue from new intelligence driven digital engagements compared to the same period the prior year. And within 5 months, 5 million customers joined IMPoin – which worked out to a daily average of 30,000 customers.

Since the inception of the program, billions of loyalty points have been earned, with over 70 percent of those points linked directly to revenue generating campaigns by the operator. Revenue linked to real-time marketing campaigns using the new CVM platform has grown 10X versus that generated by the company's prior campaign management program.

Indeed, the program has proven to be a huge stride in the right direction, as targeted offers that give a more personalized service experience have seen an average of 33% uptake rate. TR

> Indosat has seen significant improvements in revenue and churn management, with a 3.5X increase in revenue from new intelligence driven digital engagements compared to the same period the prior year

The future of direct carrier billing and carrier-OTT partnerships

Increased smartphone penetration and a rise in demand for over-the-top (OTT) content have driven the growth of the global direct carrier billing (DCB) market. Valued at US$29.8 billion in 2019, the global DCB market is estimated to reach US$70 billion by 2025, fuelled by a surge in video and audio streaming, as well as consumers' preference for seamless, secure, and accessible payment modes.

Fuss-free transactions for Asia's unbanked populations

Linked directly to consumers' mobile phone bills, consumers can enjoy fuss-free transactions in the absence of a bank account or credit card with DCB. This is in contrast with credit card payments that require consumers to input their credit card number and name. In comparison, a simpler checkout process results in lower abandonment rates and higher conversion rates for merchants. This payment method is also more secure as personal information is not being shared.

On top of offering convenience, DCB presents unprecedented opportunities for carriers to tap into Asia-Pacific's (APAC) unbanked population – totaling more than 1 billion. In Southeast Asia, where financial inclusion is particularly low, about 75% of the population does not have access to formal banking services.

Increased partnerships with OTT providers

A flurry of lockdowns and stay-at-home measures have resulted in the rise in video and audio streaming in the past year. According to The Trade Desk, 180 million consumers stream 8 billion hours of over-the-top (OTT) content per month in Southeast Asia, making its OTT market one of the fastest-growing in APAC.

By 2025, Media Partners Asia predicts that video-on-demand subscriptions will reach 417 million in the APAC region, up from 269 million in 2019. Of which, China will account for 65% of the total subscriptions.

This trend in increased streaming is expected to persist in a post-pandemic environment driven by more affordable subscriptions, quicker download speeds and a growing DCB market, which in turn spurs more partnerships between carriers and OTT providers.

Carriers have an advantage in delivering content with a billing mechanism already in place. This gives consumers an added incentive to subscribe to services by OTT providers such as Netflix, Disney+ and Spotify, bundled into carrier subscriptions so that consumers can have all their content needs met by a single source in a single bill. According to Ovum, carrier billing is also the most popular method of revenue sharing in such partnerships.

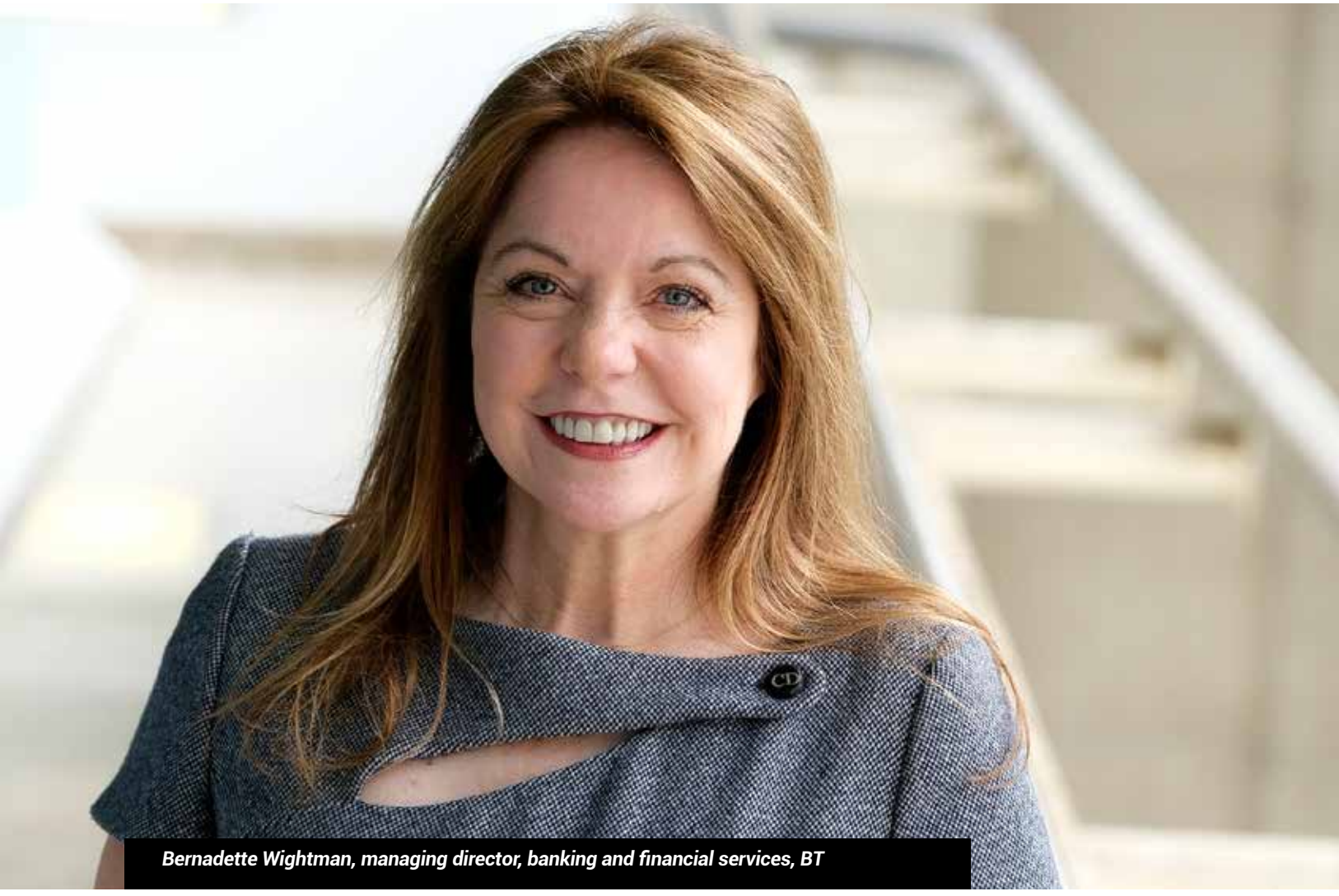
For carriers, it means providing added value and better brand positioning in a competitive landscape. For OTT media providers, it means higher conversion rates. The result is win-win as both parties achieve the benefits of increased user acquisition, retention and essentially, revenue.

Apart from OTT giants like Netflix, Disney+ and Amazon Prime, APAC has a diverse market that includes regional and even local OTT providers. In South Korea, for instance, home-grown Wavve is the leading OTT media provider. This is followed by Netflix. When LG UPlus entered into an exclusive deal with Netflix in 2018, its subscriptions for its IPTV grew by 20%. More recently, it was reported that LG UPlus is now exploring a partnership with Disney+, which has amassed more than 100 million global subscribers just 16 months after its launch. SK Telecom, on the other hand, is reportedly signing a partnership with Apple TV+. However, OTT media providers might approach the South Korean market differently, following a decision by the Seoul court in June for Netflix to pay SK Broadband network usage fees amid heightened streaming audience and traffic.

In India, one of the fastest-growing markets for OTT content in the world estimated to reach US$5 billion by 2023, partnerships are highly coveted to court a burgeoning smartphone population. Worldwide Mobile Data Pricing also noted that India has the cheapest average cost of mobile data in the world, at Rs 6.7 (US$0.09) per gigabyte. According to Ovum, about 56% of Indian consumers are already paying for more than one online video service, with the pay-per-use model being more well-received as compared to monthly subscriptions. To attract more consumers, OTT providers are turning to subscription video on demand or advertising video on demand. Amazon's miniTV is one such provider that offers its content free.

Moving forward, the onus is on carriers and OTT providers to better curate content suited for the respective markets and attract consumers consumption. This is on top of overcoming challenges such as integrating seamless back-end systems and ensuring that streamed content is high quality without comprising on profit margins. TR

This trend in increased streaming is expected to persist in a post-pandemic environment driven by more affordable subscriptions, quicker download speeds and a growing DCB market, which in turn spurs more partnerships between carriers and OTT providers



Bernadette Wightman, managing director, banking and financial services, BT

Enhancing cybersecurity: Protecting people, data and services

Remote working has made cyber threats more prevalent globally. Now more than ever, cybersecurity must be at the forefront of business processes. Telecom Review Asia interviews Bernadette Wightman, managing director, banking and financial services, BT, to find out more about cybersecurity challenges that stem from hybrid working and best practices to adopt as organisations tackle evolving risks.

The pandemic has upended work and accelerated remote working globally. With hybrid working becoming a new pattern in the global workforce, what are some of the challenges faced by organisations?

The pandemic gave millions the opportunity to experience the benefits of working from home. The main challenge is to move on from the emergency arrangements of the past year and enable ways of working that can support a diversity of workstyles. This needs to be done sustainably and for the long term. It applies to all businesses: those that want to re-introduce office-based working style, those that will allow 'work anywhere' for all, and every variation in between.

What makes this challenge hard is finding the right balance between the three core pillars of hybrid working: collaboration, connectivity, and security. This combination will be unique for each organisation. If hybrid working is to be the norm, then it needs to meet all the standards of accessibility, service quality, and inclusivity of the old, office-centric model. Security, of course, remains paramount.

How can organisations improve the existing infrastructure to support new and evolving needs?

The good news is that most organisations already have the tools and services needed – they only need to work out how to choose, combine, and deliver those services in a way that allows people to be productive, collaborative, motivated, and well-protected. Over the course of last year, enterprises have already embarked on digital transformation programmes, started to develop hybrid networks, and prioritised security.

It is not about choosing only one 'right' collaboration technology to increase productivity and achieve business outcomes. What employees need is different tools for different jobs, and that choice should be left to them. The key for employers is to enable that choice, figuring out how to bring together this variety of tools and services behind the scenes so that people have a consistently brilliant experience wherever they are.

A supportive infrastructure must also be adaptable and resilient. Improving local area network performance is critical to enabling new ways of working. Office networks are under severe strain with video meetings up more than 300% and will remain as the new norm.

In addition to the local area networks, organisations must also improve networks connecting employees working from home. Software defined networking is especially useful when it comes to providing optimal home working experience at a relatively low cost.

Most importantly, networks and applications need a solid security wrap delivered through technology as well as people. We call this switching on human firewall. This means investing in governance and training and maintaining the cyber hygiene.

How does BT support organisations in adopting best practices to help them successfully deploy a diversity of working styles?

At BT, our services, platforms, and partners are equipped with local and global expertise to help organisations adopt industry best practices and standards.

BT enables a choice of platforms – Microsoft, Zoom, and Cisco – that work together through session layer and the right network, to ensure organisations provide the best collaborative experience for employees, whatever

the platform and wherever they choose to work. That is putting people first and setting them up for success in the hybrid working world.

When it comes to building a supportive, adaptable, and resilient infrastructure, we help organisations ask the right questions to arrive at new insights. These insights are key to understanding what traffic to prioritise, where the bottlenecks are, and how organisations can fine tune their network for the best user experience.

We are also a cybersecurity specialist and partner. What we bring to the table is intelligence, experience, and operations to help organisations respond in real-time to the rapidly evolving threat landscape and the unpredictability of the future of work.

Cybersecurity is a growing threat exacerbated by remote working. How can organisations better protect people, data, and services to mitigate breaches and losses?

Cybersecurity is now the number one priority for business leaders and the pandemic has only reinforced its importance. According to our 'CISOs under the spotlight' whitepaper, more than half – 58%– of leaders say that improving data and network security has become even more important for their organisation in the past year.

On the other side, we can see the erosion of trust among consumers. Less than a fifth – just 16 per cent – of those asked said they strongly agree that they trust large organisations to protect their personal data. And almost two thirds, or 64 per cent, said they would recommend a large organisation that they think makes a big effort at keeping their data secure. There is a real opportunity for organisations to make security a key differentiator.

They can do this by first getting the basic cybersecurity measures right – which means knowing their security inventory and ensuring routine software patching is never missed. They must then focus on employees, helping them protect the company by understanding the threats and ways to manage them. They should also bake and embed security into every application and every service, right out of the gate, taking preventive rather than reactive measures.

The role of Chief Information Security Officers (CISOs) is critical to the success and protection of businesses. How can CISOs bridge gaps between policies and practices in organisations?

We have seen huge gaps between policy and practice. Just under a third of executives say IT security is excellent at educating colleagues about the need for security. And less than half – or 45 per cent - say they have received training on data security.

Moreover, employees do not admit to mistakes. Nearly half of employees say they personally have had a security incident but have not declared it. Only one in three are 100 per cent aware of the policies and procedures they should take to protect the security of their organisation's data. A key issue is also making sure an organisation protects data when people leave the business.

For CISOs to bridge these gaps, they need to power up and reinforce the human firewall. One of their most important tasks is to help their colleagues across the organisation to understand that they are a key line of defence.

CISOs should educate and coach teams on how to behave safely online, help employees appreciate the impact a breach would have on the organisation and brand, and create a culture where it is encouraged and safe to speak up, to admit mistakes. TR

Beyond connectivity: Becoming digital service providers in a digital era

The industry might have stepped up to the plate in response to heightened connectivity demands in the face of the pandemic. But with connectivity being a critical enabler as we navigate a future increasingly powered by 5G and the Internet of Things (IoT), telcos will have to do a lot more moving forward to stay relevant in a competitive landscape.

On the whole, the industry is experiencing a structural change as telcos are pressured to replace legacy processes with digital-centric processes, tapping on innovation to rebrand as next-generation digital service providers (DSP). As customers demand zero-touch, digital-first solutions, this transformation is inevitable to ensure sustainable growth in the long run.

Evolving from connectivity providers

With digital transformation infiltrating all facets of societies and countries adopting a digital-first approach, telcos are well-positioned to accelerate change by embracing and spearheading digitalization to create a trickle-down effect that will significantly impact industries.

Harnessing the benefits of advanced technology in artificial intelligence, machine learning, automation and cloud to deliver faster connectivity, immersive experiences and differentiated services enable telcos to move up the value chain and add value to customers in a fast-evolving landscape.

According to STL Partners, network and service automation rank high amongst Asia-Pacific (APAC) telcos' priorities in digitalization to yield optimized internal efficiency, as well as develop new services and revenue streams. In a separate report by Nokia, telcos experienced the most ROI from automation in network operations, followed by network optimization and product/service deployment.

At the same time, telcos have to tackle the increased costs and complexity involved in upgrading existing networks and processes. To achieve a balance, telcos can position themselves strategically, using their strengths as a starting point to kickstart the shift.

Building key capabilities to expand network operations and services and adopting a native cloud strategy is instrumental to increasing end-to-end business agility, reducing cycle times and achieving cost optimization. Connectivity will be just a tool to support a suite of services and use cases as telcos move towards intelligent operations on a virtualized infrastructure to meet the new demands of its changing role.

Telcos should veer away from traditional models and move towards becoming an infrastructure as a service (IaaS) provider or platform as a service (PaaS) provider. In Asia, where the economy is spurred by SMEs – accounting for more than 90% of firms – telcos are uniquely positioned to partner with SMEs in their digital journeys. Telcos can strive towards becoming digital enterprise partners, focusing on use cases in specific verticals to propel digitalization and gain market share in the B2B market. In IDC's Worldwide IoT Spending Guide 2020, top use cases in APAC for instance include IoT for freight monitoring, manufacturing, remote health and smart grid.

Leadership and partnership

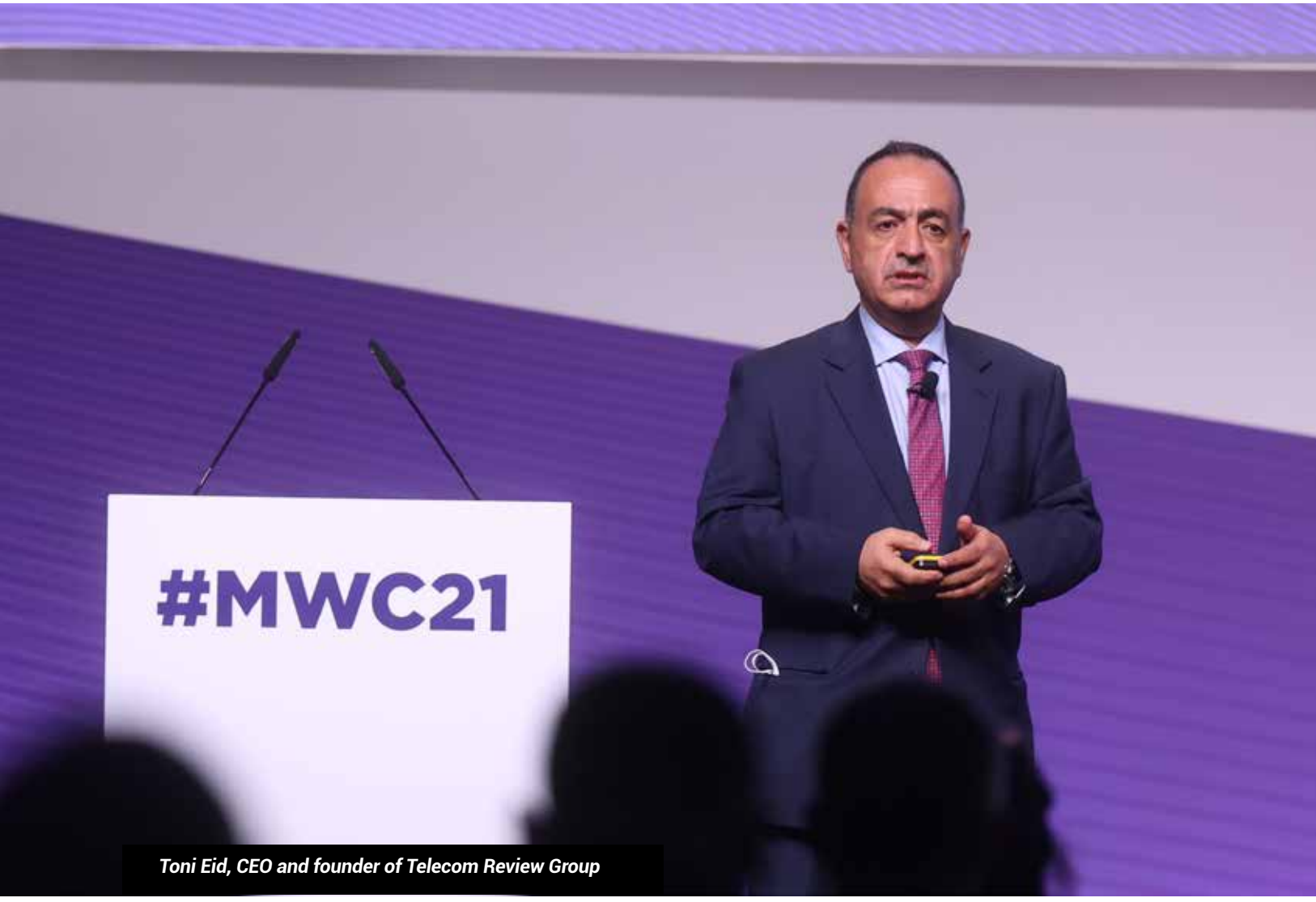
Digital transformation begins at the top, where effort is orchestrated predominantly by the CIO. Having a technology-centric CIO who can set a clear strategy and road map for transformation, as well as the ability to foster a culture of organization-wide change is important.

The right people must also work together synergistically with the right partners to push forth a fruitful change. Equally important is forging partnerships with an ecosystem of vendors, system integrators and hyperscalers to help telcos transform into digital service providers.

In the region recently, Reliance Jio announced a deepened partnership with Google Cloud to provide 5G services to consumers and enterprises. In Singapore, M1 has tied up with Microsoft to develop a new technology stack that will integrate its system into one digital platform to accelerate its evolution to a digital services provider. Rakuten Mobile and Indosat Ooredoo have also announced collaborations with Cisco to support 5G developments.

Essentially, the road towards digitalization is necessary to thrive in today's digital age. Telcos are challenged to reinvent themselves to seize growth opportunities in revolutionary times. TR

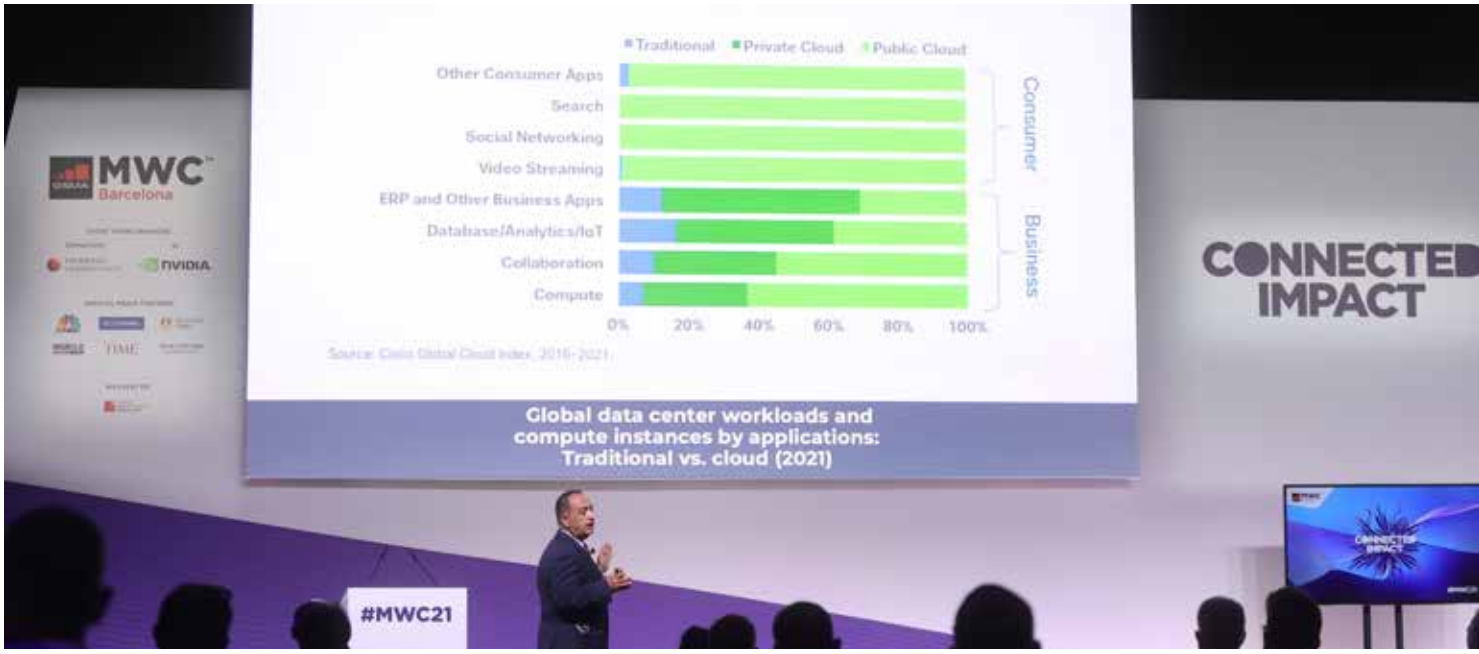
Harnessing the benefits of advanced technology in artificial intelligence, machine learning, automation and cloud to deliver faster connectivity, immersive experiences and differentiated services enable telcos to move up the value chain and add value to customers in a fast-evolving landscape



Toni Eid, CEO and founder of Telecom Review Group

Connectivity as a service: Trip to the cloud

The "Connectivity as a service: Trip to the cloud" session held at Fira Gran Via had two speakers, Toni Eid as well as Patrick Joggerst, CMO of Ribbon. The panelists who were present are Johan Wibergh, CTO of Vodafone; Bikash Koley, VP & head of Google Global Networking (GGN) and head of technology & strategy, Google Cloud for Telecommunications, Google; Sanjay Uppal SVP & GM, service provider & edge business unit, VMware; and Jeannine Peek, CapGemini, Country Leader.



Eid had a five-minute presentation which highlighted the cloud advantage, statistics about public cloud revenue forecast, hyperscale operator capex, and global data center workloads. "The challenges of COVID-19 pandemic accelerated the adoption of cloud services to keep us connected like never before," he emphasized. As a result, top cloud service providers of today — Google, Amazon, Microsoft, and Alibaba — have shown 23-46% revenue growth during Q1 2021.

The $80 billion cloud application services market (SaaS) is seen to be the biggest growth driver in terms of public cloud service, anticipated to be worth $143.7 billion by 2022. Telecom Review Group's CEO and founder also displayed a graph illustrating the traditional move of the apps on the cloud. "The consumer apps are almost totally in the public cloud, search engines are totally in the public cloud, social networking is also the same. Yet, we see business applications still have a big part of the private cloud and this is also due to some regulation of some business categories or some government. This is the reason why we keep it out of the public cloud."

Along with the continuous growth of cloud hyperscalers and the massive demand for cloud usage, the process of enabling independent connectivity is needed to address the needs of the society. According to Toni's presentation, Google, Amazon, and Microsoft all have significant number of subsea cable investments across the globe, connecting Europe, Asia, North America, and Middle East seamlessly.

In line with this, cloud providers have already collaborated with network providers to cater for new market trends in the 5G and IoT era. These include partnerships with Etisalat, AT&T, Ooredoo, PCCW Global, Verizon, Vodafone, and Zain KSA.

When asked during the panel about which of the current cloud trends, particularly edge, no-code/low-code, and further increase of as-a-service business models would be most important and will have the most impact on the network, Eid answered, "As we see during the pandemic, the no-code/low-code trend has already started. Alibaba has increased over 50% of new apps on the Alibaba Cloud as they are all using software with no-code/low-code. This trend makes everything simple as we work from home and it is easy to deploy and will be very flexible to the cloud."

Moreover, in network innovations, "SD-WAN has flexibility, high-security, protection, and managing is easier especially when you increase the traffic. But always, you need to upgrade your infrastructure. You know it's SD-WAN, not just so you can deploy one, but you have to deploy the whole network. Hence, the whole ecosystem should be agile with the SD-WAN software."

"The world has changed dramatically and the cloud is here to stay. It is the strong enabler that enables a lot of different levels of service. But a secure network is still the fundamental value," said Patrick Joggerst, CMO of Ribbon.

During the session, Sanjay Uppal SVP & GM, service provider & edge business unit, Vmware highlighted that "clients must keep in mind the questions of you don't own anything and you don't know anything. If you build a zero trust architecture, you can reduce the attack surface."

"We are finally getting into an age that the data environment can really make a difference for our customers," Jeannine Peek, CapGemini, country leader concluded. TR

Toni Eid, the CEO and founder of Telecom Review Group, graced the stage as one of the speakers of the physical-only session that highlighted the switch to a cloud native approach in terms of connectivity.

The role of telecoms in a growing big data analytics market

In today's data-driven world, more organizations are investing in big data analytics to improve business performance and build business resiliency as the world experiences unprecedented digitalization.

According to IDC, big data and analytics (BDA) spending in the Asia-Pacific region, has been on the rise. In 2020, revenue for BDA solutions reached US$22.6 billion, representing a growth of 12% from the preceding year. IDC predicts that this revenue will grow with a five-year CAGR of 15.6% for the period from 2019 to 2024.

Banking is the top vertical leading the overall BDA market, followed by the telecommunications sector, where big data analytics has been applied to predictive customer churn analysis, for instance.

Since telecom operators handle billions of records every day, the use of big data converts raw data into

meaningful insights that are valuable to enterprises and the government.

In the region, China accounts for the largest share of the BDA solutions market, driven by banking and state and local government. Even Chinese factories have turned to big data to focus on the domestic market when exports were disrupted last year. When overseas demand dropped and China was at the height of the pandemic, factories turned to e-commerce giants like Alibaba and JD.com to track consumer behaviors. Within just three months, Alibaba successfully helped 300,000 Chinese export factories to focus on local consumers.

To secure tech supremacy, China is investing heavily in emerging innovations. In May, China's state media announced a US$3 billion plan to build a supercomputing center to analyze data obtained from space by the end of the year. The center will provide big data services for industries such as the aerospace and marine sectors as early as next year.

Taking cues from the central government, companies are also investing in big data. Last month, tech giant Tencent and venture capital firm Sequoia China led a US$25 million funding round in a Chinese big data startup to capitalize on global digitalization efforts.

In Malaysia, where big data analysis is still in its early stages, IDC has forecasted that the BDA market will grow from US$1.1 billion in 2021 to US$1.9 billion in 2025. In another research commissioned by Malaysia Digital Economy Corporation (MDEC), findings show that the services sector will dominate the BDA market, contributing 64% of total spending, followed by banking and telecommunications, with both contributing to a third.

Malaysia has plans to become a regional data hub leader, with capabilities such as big data, IoT and AI. In May, Microsoft announced that it is establishing its first data center in Malaysia's Greater Kuala Lumpur area. Estimated to cost US$1 billion, this investment is expected to create 19,000 jobs and generate US$4.6 billion in revenue for Malaysia.

New revenue sources across sectors

Amid big data growth and advances in big data analytics, global telecom operators are well-positioned to take advantage to compete. Apart from transforming customer experiences within to reduce customer churn and improve operational efficiency, the telecommunications industry is in a unique position to mine the sheer volume of data for other sectors as data becomes a key differentiator to stand out among competition.

Insights into big data present telecom operators monetization opportunities when offered to organizations across increasing industries that are recognizing its perks. Such industries include logistics and shipping, as well as the retail industry.

In the logistics industry, for instance, historic data and pattern analysis that take into consideration seasons and cycles can be used for predictive analytics. Insights from data can be used to predict future volumes, route planning using real-time analytics on weather and traffic conditions for route optimization, and more efficient dispatch of transportation vehicles to prevent delays. Predictive analysis also enables robotic systems to scale inventory management in warehouses as needed. Essentially, big data analytics offers visibility and transparency throughout the supply chain so that firms can better respond to immediate real-time information for smoother operations.

Big data also promotes client segmentation and target marketing to attract and retain existing clients in the retail sector. For example, telecom operators can run analytics on consumer data that are sought after by retailers to enhance existing targeted marketing campaigns. More specifically, behavior analytics carried out by telecom operators can help retailers connect with their buyers both online and offline and decide if it is worthwhile opening a store or franchise in a particular precinct.

Given that the telecommunications industry is inextricably linked to organizations in today's digital age, data-driven insights are an important driver for the continued relevance and prosperity of organizations across diverse sectors. The onus is on telecommunications operators to tap on this growth area. TR

Apart from transforming customer experiences within to reduce customer churn and improve operational efficiency, the telecommunications industry is in a unique position to mine the sheer volume of data for other sectors as data becomes a key differentiator to stand out among competition

ZTE receives 2021 Global Server Product Innovation Award by Frost & Sullivan

ZTE Corporation has been presented with 2021 Global Server Product Innovation Award by Frost & Sullivan, based on the investigation and analysis of 2021 global server product market, as well as the research and evaluation on mainstream server competitors within the industry.

This award is to honor ZTE Corporation's continuous innovation and progress in the global server product market, its technology leadership position in the industry, and its contribution to the overall development of the server industry.

ZTE keeps up with the trends, constantly innovating technology and launching new products to meet new requirements:

In the aspect of data processing, The G4X server newly introduced by ZTE uses 2 Intel Xeon third-generation extensible processors (Ice Lake) with a single processor up to 40 cores. Its performance is at the top level of the industry, providing an efficient engine for enterprises in the process of digital transformation.

In the aspect of meeting the needs of multiple industries, ZTE G4X server boasts four to eight built-in heterogeneous and intelligent computing acceleration engines, which can satisfy the requirements of various scenarios of artificial intelligence, image processing and industrial control, etc.

In the aspect of server reliability, ZTE G4X server can effectively meet the server reliability requirements of government, finance, railway, power grid and other enterprises. For instance, all ZTE servers are designed and produced based on telecom equipment standards. The reliability of the products is also verified by telecom product requirements, and can be efficiently adapted to the business environment of enterprises.

In the aspect of environmental adaptation, ZTE adopts stringent standards for verification from R&D and design to producing and manufacturing. For example, to verify and improve ZTE G4X server's reliability under high-stress environmental conditions, the server is tested at high and low temperatures ranging from 0 to 50 degrees. Moreover, to improve the protection capability of ZTE's products in complex environments, ZTE uses a higher level of 6-8kV test standards. Furthermore, to identify extreme working conditions of products and continuously improve the product design, ZTE also conducts a HALT (High Accelerated Life Test) test.

In the aspect of flexibility, ZTE G4X server realizes a flexible combination of "1 product, 2 chassis and 7 models" through modular design, effectively reducing O&M costs and deployment time for enterprise customers. It even refreshes world records of SPEC CPU performance tests, setting new world records in floating-point calculation and integer calculation performance tests.

Overall, ZTE G4X server features ultimate performance, flexible expansion, high reliability and efficient O&M, providing new momentum for the digital transformation of various industries.

SES strengthens cloud leadership through Amazon Web Services

SES has joined the Amazon Web Services (AWS) Direct Connect Delivery Partner program. Through a technical and business review process, AWS validated SES's ability to connect its customers directly to their AWS services over its network of multi-orbit satellites. This provides SES customers flexible, secure, reliable access to their cloud-based applications and services from virtually any location around the world. This is a major advantage to both enterprises and government users who require reliable bandwidth while working in remote locations. SES is the first satellite operator to achieve AWS Direct Connect Partner status.

As an AWS Direct Connect Delivery Partner, SES can provide enterprises and governments with dedicated connectivity between virtually any location around the world. For SES customers, direct connectivity to AWS via satellite gives them access to their cloud-based applications and services from remote, rural or other locations with limited or no network options. Equally, the satellite connectivity delivered by SES can serve as network redundancy for critical cloud workloads in case of a fibre cut or other network outage. This capability allows SES customers to enjoy improved efficiency and productivity, while also taking advantage of the elasticity and cost savings provided by AWS, regardless of geographical location or local network infrastructure options.

AWS Direct Connect makes it easy for customers to establish a dedicated network connection between their office, data centre, co-location site or other facility and AWS at speeds from 50 Mbps up to 100 Gbps. For customers with large-scale workloads, AWS Direct Connect provides secure, flexible connections with consistent network performance and reduced bandwidth costs.

SES will use its Cloud Direct service to connect its customers to AWS data centres over its network of medium earth orbit (MEO) and geostationary (GEO) satellites. The Cloud Direct service will also be available on SES's next-generation MEO constellation, O3b mPOWER, launching later this year. O3b mPOWER will provide SES customers with the ideal satellite-enabled cloud connection, supporting multi-gigabit services that adapt dynamically to network demand.

PCCW Global launches on-demand services to leading IX platform through Console Connect

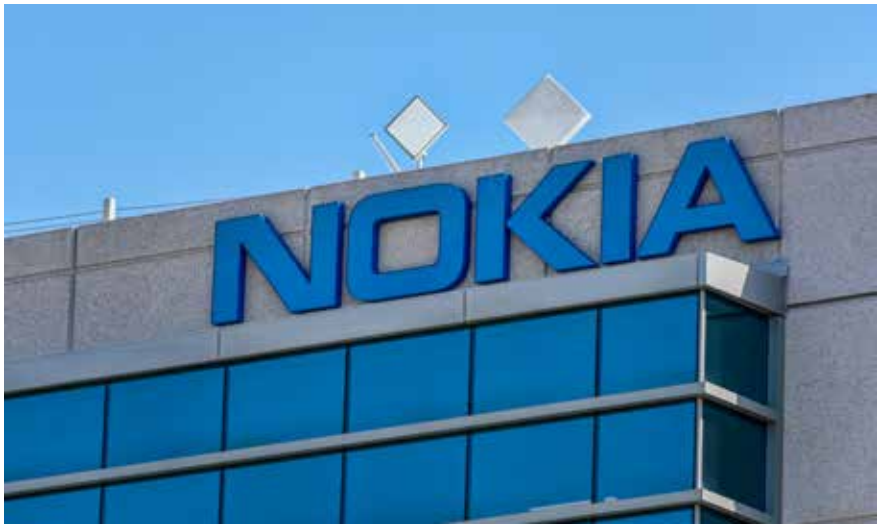
PCCW Global has launched a new IX-as-a-Service (IXaaS) that makes it easier, faster and more flexible to order, provision and pay for IX services from some of the world's largest Internet Exchanges (IXs).

Carriers and enterprises can now directly order IX services and pay for their connections to leading IX platforms in real-time and on-demand via the Console Connect digital platform. Console Connect users can experience high-performance remote peering with multiple exchanges across the world, including DE-CIX, LINX, SGIX, KINX, JPNAP, BBIX and thus manage their IX services and connections through a user-friendly web portal.

IXaaS forms part of Console Connect's new MeetingPlace, where users can meet, buy, and sell within a growing ecosystem of cloud, data center, colocation, SaaS, UCaaS, IX and IoT partners, while making on-demand virtual interconnections between and among applications, services and one another. Through the MeetingPlace's community of IX providers, Console Connect users can self-provision and pay for both their IX services and virtual connections in a few clicks.

Multiple virtual connections can be provisioned via a single Console Connect Access Port and are delivered across PCCW Global's leading global network, providing users with real- time connectivity among IX peering partners from 450 plus Console Connect-enabled data centers across over 50 countries. Through the Access Port, Console Connect users can also order metro or international connectivity between data centers, or directly interconnect with major cloud, SaaS and NaaS platforms in each region around the world, including AWS, Alibaba Cloud, Cloudflare, Google Cloud, Microsoft Azure, RingCentral and more.

Nokia secures first 5G contract in China



Nokia recently secured a 5G RAN contract for China Mobile, making this the company's first 5G contract in the country.

Nokia was awarded a 10% share in one of three contracts tendered by China Mobile, while Ericsson obtained 9.6% of another contract. The total tender for all three contracts reached about $6 billion, with Nokia being awarded 4% of the overall tender. Comparatively, Ericsson was awarded 2%, dropping from about 11% last year.

Together, Huawei and ZTE won the majority share in all three contracts to build 5G 700 MHz base stations for China Mobile and China Broadcasting Network. This is followed by a smaller local company Datang Corporation.

China Telecom and China Unicom will also be disclosing awards of their respective 5G contracts. Currently, China is ahead of other countries in 5G deployments. According to data from the Ministry of Industry and Information Technology, China had deployed 820,000 5G base stations by the end of March.

Huawei and GAC build futuristic smart SUV to hit markets by 2023

Chinese tech giants Huawei and GAC Group will work together to develop a "smart SUV", aiming to hit the market in mass production by the end of 2023. The two companies' first joint product is planned to be a medium- to large-size, pure electric SUV with a futuristic and powerful vision and efficient technology that will bring exciting new energy capabilities and Level 4 autonomous driving to buyers.

Huawei is a global leader in many types of technology and GAC Group embraces and encourages extensive technological innovation in its vehicles. This strategic cooperation will allow them to build a new generation of intelligent vehicles and digital platforms. This SUV and multiple other future models will utilize GAC's GEP.30 chassis platform and Huawei's CCA (computing and communication architecture), as well as carrying Huawei's full stack of intelligent vehicle solutions.

Given the intensifying campaign on the reduction of greenhouse gas (GHG) emissions, the global market for electric vehicles is only witnessing considerable growth. Recent market research data predicts that the EV global market will expand almost fivefold between 2016 and 2027; an annual increase of 20%. GAC Group is positioned to fully embrace this trend towards creating cleaner, greener, better cars, with GAC MOTOR aiming to produce an entirely electrified lineup of vehicles by 2025.

This rapid growth demonstrates a new demand in the automobile market for intelligent cars, and for Chinese craftsmanship. With new technologies, new processes and new materials, as well as the use of intelligent manufacturing and comprehensively improved production capacity, Huawei and GAC aim to produce eight models and multiple series of cutting edge electric vehicles that provide a new driving experience at ever lower costs.

Gaw Capital Partners forms partnership with Data Center First

Real estate private equity firm Gaw Capital Partners announced the establishment of a new joint venture operating company, Data Center First Pte Ltd., with Mr. Wong Ka Vin as the Co-Founder & Chief Executive Officer with its maiden project in Batam, Indonesia. Data Center First, headquartered in Singapore, is a data center operator and the first platform investment made by Gaw Capital Partners to support its IDC investments in Asia outside of China.

Mr. Wong Ka Vin is an industry veteran with a track record in building successful data center platforms and professional teams like i-STT in 1999, followed by Equinix Asia Pacific in 2002, CSF Group Asia which became ChinData in 2011, and finally returning to Singapore to lead and re-brand 1-Net by building 1-Net North, Southeast Asia's first Uptime Certified Tier III design and constructed 30MVA facility in Woodlands, Singapore in 2013.

The data center campus in Nongsa Digital Park is the maiden project with Data Center First. This project leverages on the fact that Nongsa Digital Park has been slated as the "Digital Bridge" that connects Singapore to many of Indonesia's fast-growing cities. In addition to this maiden project in Batam, Indonesia, Data Center First will also work with Gaw Capital Partners to originate, evaluate and develop data center projects in Southeast Asia and beyond.

Gaw Capital Partners sees the IDC development as part of the bigger story that will encompass the broader and larger global opportunities that the digital economy brings. There is an ever-growing amount of data traffic that is driving demand for data centers to consolidate servers, store data and manage network support, thanks to technological advancements in 5G communications, 4K transmission, the Internet of Things (IoT) and artificial intelligence.

The rise of location-based advertising in a digitalized world

With the rise of IoT and connected devices as companies innovate to drive profitable growth, location data is becoming an increasingly important asset across myriad industries such as retail and logistics, where consumers are reached out to based on location data to create enhanced customer experiences.

Compounded by the pandemic, there has been a widespread interest in harnessing location data as countries fight to contain the spread of the virus through contact tracing. In many countries worldwide, telecom operators have been sharing aggregated location data with the health authorities to help them access the effectiveness of prevailing measures. Countries such as China and South Korea are even using mobile data locations to track the location of quarantined individuals.

Dubbed the backbone of connectivity across industries during this pandemic, the telecommunications industry has been witnessing heightened traffic and has amassed vast location data that can add real value internally and externally in a digitalized world.

Globally, the location-based services market in APAC will experience the highest growth in the coming years. Of which, location-based advertising (LBA) accounts for a large part of this market across all regions.

According to the Location Based Marketing Association (LBMA), the public's perception of location data now goes beyond selling to include raising public health awareness as governments rely on location data during this pandemic. In Asia-Pacific (APAC) for instance, 79% of surveyed companies viewed location-based services ad targeting data as valuable. Of the location-based technologies, APAC utilized Bluetooth technology the most, followed by beacon technologies, Wi-Fi and GPS.

As e-commerce is beginning to replace more brick-and-mortar, and as we are recording an increase in smartphone penetration along with a more robust app landscape as businesses embrace digital transformation, the location-based market will continue to note an upward trend.

The popularity of social media by consumers has also contributed to LBS across all industries in recent years. In the retail industry, for instance, geofencing has been a popular marketing strategy to drive customer loyalty through mobile apps. Businesses can present ads, promotions and coupons based on where their consumers are geographically located.

With the rapid digitalization across business verticals, progressive businesses are recognizing the increased value of combining both location and timing to support more advanced marketing strategies and new market opportunities, utilizing real-time location-based marketing to effectively reach out to consumers. According to Research and Market, the global LBA market is expected to reach US$163.5 billion by 2026, representing a CAGR of 18% between 2020 and 2026.

Location-based marketing outperforms traditional marketing methods. In a saturated or highly competitive market, for instance, operators can leverage real-time messaging to upsell or cross-sell products or services, sending promotional messages to subscribers when they are near or enter a specific store. Using geo-targeting, well-timed advertising campaigns not only facilitate enhanced service delivery, but also yields higher conversions, greater success and ultimately, maximum return on investments. This is also one way to drive consumers away from competition to gain a larger market share.

With plans to scale as digital services become more intertwined in our lives than ever before, Uberall recently announced an acquisition of a location marketing company in the US to further scale its businesses.

Driven by the same agenda, Telenor Pakistan also announced a partnership with Starcom to monetize postpaid and prepaid customers' data using location-based marketing. Currently, Pakistan does not have a data protection law.

Location-based advertising is effective throughout a consumer's journey, from purchase, to engagement and retention. Needless to say, location is just one factor, albeit an important one. Augmenting location with human-centric data, such as consumer patterns, also comes into play in advanced analytics to tailor personalized services experiences. TR

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Submarine Networks

Submarine Networks is the leading annual gathering of subsea communications leaders. The event congregates the global subsea community to exchange knowledge, explore the latest projects and develop strategies and lucrative new partnerships to drive the industry forward.

Place: Singapore Suntec Convention & Exhibition Centre

29 - 30 SEPTEMBER

Digitizing the capacity industry

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

Place: virtual

5 OCTOBER

Gitex

GITEX is an annual consumer computer and electronics trade show, exhibition, and conference. It is one of the biggest shows in the annual tech calendar with over 4,500 exhibitors from around the globe, featuring technology from big tech companies to government entities to next generation startups.

Place: Dubai World Trade Centre and virtual

17 - 21 OCTOBER

Latest updates on:
www.telecomreviewasia.com

Telecoms World Asia

Telecoms World Asia is an annual platform for leading international carriers, operators, authorities and suppliers to meet, learn and create fruitful business partnerships for the betterment of wholesale revenue and growth.

Place: Centara Grand & Bangkok Convention Centre

16 - 17 NOVEMBER

Telecom Review Leaders' Summit 2021

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

Place: InterContinental Dubai Festival City and virtual

08 DECEMBER

Latest updates on:
www.telecomreviewasia.com

TELECOM Review
virtual panels

Telecom Review's virtual panels' series continues in 2021

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

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

The 2021 series is set to cover the topics of:

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

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

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