TELECOM Review



ICT for All: Fostering
Diversity and Inclusion in
the Digital Era

The Technological Renaissance: Saudi Arabia's Journey to a Digital Future Orbiting Excellence: The Maturity of Satellite Tech



JOIN THE MOST INFLUENTIAL VIP ICT GATHERING





TELECOM Review

THE TELECOMS INDUSTRY MEDIA PLATFORM

telecomreview.com



■ Connecting the Digital Future: Rosenberger's High-Performance Connectivity Solution



 Advancing Digital Innovation in SMBs: From Disruption to Transformation



- ZOI: A One-Stop-Shop for International Hyperscalers and Submarine Cables
- 16 Vodafone Oman: Pioneering Oman's Digital Transformation
- 18 Meet Hicham Siblini: The Visionary CTIO Leading Asiacell's Technological Innovation
- 19 The Evolution and Impact of Mobile Financial Services
- 22 Strengthening Iraq's Telecom Industry for a Brighter Digital Future
- 24 The Technological Renaissance: Saudi Arabia's Journey to a Digital Future
- 28 The Battle of Content: Menace or Boon of Al Era?
- 30 From Core to Edge: A Holistic Strategy for Seamless Machine Learning Integration



- Nokia: Building a Digital and Sustainable Future in the Middle East
- 32 ICT for All: Fostering Diversity and Inclusion in the Digital Era
- 36 Why Telcos Need to Focus on Autonomous Mobility
- 41 Orbiting Excellence: The Maturity of Satellite Tech
- **44** Al in Education: A Journey of Transformation and Regulation
- 46 How the Cloud is Transforming Disaster Recovery Services
- 48 Al's Watchful Eye: Safeguarding Cybersecurity in the Generative Era
- 52 Unveiling the Cosmic Potential of Quantum Technologies in Space Exploration



ChatGPT Unlikely to Contribute to Bioweapon Creation

OpenAl's GPT-4 study suggests a marginal advantage in bioweapon research, prompting debate over its significance and raising questions about the model's true superiority.

READ MORE



META Workforce Link Salary Surge to Improved Digital Proficiency

The absence of digital skills not only hinders career progression and income growth but also poses significant cybersecurity risks for the employing organizations.

READ MORE



Dubai Ministry of Finance Saves 39,000 Hours with Robotic Automation

In a groundbreaking move towards modernization, the Ministry of Finance in Dubai has successfully completed the second phase of integrating Robotic Process Automation (RPA) into its internal operations, resulting in a remarkable saving of 39,000 working hours.

READ MORE



WhatsApp Boosts Security: Chat Lock on Web and More Exciting Upgrades

WhatsApp is reportedly extending its 'Chat Lock' feature to the web client, allowing users to secure individual chats. A leaked image indicates a padlock icon on the redesigned sidebar for accessing locked messages.

READ MORE



Linking Human Brains to Computers

The field of brain-machine or brain-computer interface research has been making tremendous progress with the possibility of installing brain implants in humans.

READ MORE



Social Media Active Users Breaks 5 Billion

With over 5 billion active social media users worldwide, accounting for approximately 62.3% of the global population, the influence of social platforms continues to grow exponentially.

READ MORE

Founder of Telecom Review Group CEO of Trace Media International Editor in Chief

Toni Eid toni.eid@tracemedia.info

Senior Journalists

Elvi Correos elvi@tracemedia.info

Jonathan Pradhan jonathan@tracemedia.info

Senior Editor

Sahar El Zarzour sahar@tracemedia.info

Editorial Team

Christine Ziadeh, Corrine Teng, Clarissa Garcia, Elvi Correos, Elza Moukawam, Jeff Seal, Jessica Bayley, Jonathan Pradhan, Marielena Geagea, Mira Jabbour, Novie Nuñez, Pia Maria El Kady, Sahar El Zarzour, Siena Distura

Copy Editor

Jessica Bayley

Director of Content for Media & Events

Christine Ziadeh christine@tracemedia.info

Advertising Enquiries

Ershad – Sales Director – Group ershad@tracemedia.info

Responsible Manager

Nada Eid

Chief Operating Officer

Issam Eid

Operations Director – Group

Anna Chumak

Graphic Designer

Tatiana Issa

News

Provided in cooperation with AFP, the global news agency

Published by



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 M. +961 70 519 666

Trace Media FZ.LLC.

Dubai Media City, UAE Building 7, 3rd Floor, Office 341 P.O. Box 502498, Dubai, UAE Tel. +971 4 4474890 M. +971 55 639 7080

Printing

Al Nisr Publishing LLC

© All rights reserved Publication of any of the contents is prohibited

Year 19 | Issue 208



Connecting the Digital Future: Rosenberger's High-Performance Connectivity Solution

Rosenberger, a global leader founded in 1958, designs and manufactures connectivity solutions for diverse industries worldwide. Renowned for innovation and its technological leadership, Rosenberger offers high-performance interconnect solutions with its core competence in high-frequency, high-voltage and fiber-optic technology; supporting mobile communication networks, data centers, test and measurement applications, automotive electronics, as well as high-voltage contact systems, medical electronics, industrial electronics and aerospace engineering. With over 30 locations and more than 14,200 employees worldwide, Rosenberger's commitment to cutting-edge technology and localized services ensures tailored and integrated solutions for evolving customer needs.

n an exclusive interview with Telecom Review. Eric Küppers, CEO of Rosenberger Group, shared insights on the evolution of the digital era, emphasizing the pivotal role that Rosenberger's highperforming connectivity solutions can play in driving this global transformation trend forward. Additionally, he offered valuable perspectives, highlighting the facilitation of a 5G-Advanced infrastructure, the networks of smart buildings and hyperscale data centers, as well as edge-computing and sustainable initiatives in the Middle East region.

What is your vision for the increasing importance of data in the future, and how do you anticipate it will affect telecom and data center connectivity infrastructure? Additionally, how does Rosenberger plan to contribute to meeting the demands of this global trend?

We produce more data year-afteryear with an explosive growth of data consumption and access. The dramatic surge in information consumption began in 2020, following the pandemic where remote collaboration solutions like Zoom and Microsoft Teams have grown in popularity. The IDC's new Global DataSphere Forecast, 2021-2025, forecasted that global data production and replication will expand at a compound annual growth rate (CAGR) of 23% during the projection period, reaching 181 zettabytes in 2025. The digital era represents a transformative shift towards a more connected, data-driven, and technologically advanced society. It is marked by seamless connectivity, with individuals, devices, and systems interconnected through the internet and other communication networks. Massive amounts of data are generated, collected, and analyzed at an unprecedented scale, driving insights, innovation, and decisionmaking across various industries and sectors. This is where Rosenberger comes into play.

 Facilitating 5G-Advanced Infrastructure: From 5G to 5.5G (or 5G-Advanced), we are taking a big step towards the intelligent future.
 5G-Advanced is the next generation of 5G network technologies and the



Rosenberger Group's headquarters is located in Fridolfing, Germany.

foundation of all-scenario digitalization. Rosenberger stands at the forefront of this transformation, empowering telecommunications operators, and infrastructure providers to construct robust and efficient networks capable of meeting the demanding requirements of 5G-Advanced technology, including high-speed data transmission, low latency, and increased capacity. Our Site Solution offerings, designed to ensure optimal total cost of ownership (TCO), encompass a range of solutions such as low-PIM coaxial products, FTTA, PTTA, and HybridTTA site infrastructure solutions, along with the cuttingedge CellMax base station antenna, presenting customers with a convenient one-stop shopping service.

Empowering Smart Enterprises:

Fast-growing vertical industries, such as transportation, healthcare, and intelligent manufacturing factories require customized upgrades or a higher bandwidth of cabling infrastructure and network management software. Rosenberger provides diversified solutions to support building private enterprise networks, and passive fiber-optic broadband networks, including last-mile connectivity of high performance and reliability.



Currently, 63% of our global electricity is generated by renewable energy sources, and we are actively working towards increasing this to at least 85% by 2028





On the left is Marc Käumle, Executive Vice President of Rosenberger's BA of Interconnect



According to Marc Käumle, from mobile communication infrastructure, data center, broadband network, industrial automation system, medical & healthcare equipment, Rosenberger's interconnect solution plays a pivotal role in facilitating seamless data and power transmission



Enabling Edge Computing and Hyperscale Data Centers:

Rosenberger's Data Center solutions provide robust and efficient connectivity, enabling the seamless integration of IT and IoT devices, ensuring reliable data transmission. Our connectivity solutions can also enable the establishment of small-to-medium data centers, cloud, as well as edge-computing networks by bringing computation closer to the data source and reducing latency for real-time applications.

Prioritizing Eco-Friendly Practices:

At Rosenberger, we are deeply committed to protecting the environment using ecologically friendly products, production methods, and processes.

Sustainability and environmental responsibility are core values that underpin everything we do. Currently, 63% of our global electricity is generated by renewable energy sources, and we are actively working towards increasing this to at least 85% by 2028. Additionally, our engineering team prioritizes energy efficiency in our product designs,

such as our PerConnect EcoFlexIT system, which incorporates the FTT-ACP (fiber to the active consolidation point) concept to achieve up to 50% energy savings in building cabling projects.

Overall, the future of data and its impact on telecom and data center connectivity infrastructure is characterized by rapid technological innovation, increasing demand for high-speed, low-latency connectivity, and the growing importance of security, reliability, and sustainability. At Rosenberger, we are committed to developing innovative connectivity solutions that meet the evolving needs of our customers across different industries. The company invests heavily in research and development (R&D) to design and manufacture cutting-edge connectors, cables, and components that enable high-speed data transmission, reliable signal integrity, and robust performance in diverse applications.

What is Rosenberger's perspective on the overall global market outlook, particularly in relation to the Middle East region?

For decades, Rosenberger has been a leading player in the global connectivity solutions market, serving various industries worldwide, including automotive, telecommunications, data communications, industrial, medical, and consumer electronics. Our strong industrial presence and commitment to global sustainability have been instrumental in driving market expansion, particularly in Europe and the Asia Pacific.

Furthermore, we are closely monitoring the global shift towards resilient and sustainable value chains, which presents opportunities for downstream industries in the Middle East and Africa. These regions are experiencing significant infrastructure and construction investments, leading to an increased demand for mobile infrastructure, FTTx networks, scalable data centers, and a rise in consumer electronics manufacturing. Recognizing the strategic significance of the Middle East in the Eurasian vision and its role in connecting the

economies of Europe and Asia, in 2023, we strategically strengthened our local teams across the entire Eurasian region, including the Middle East and Africa. This move aimed to provide professional support and services to our customers with improved lead time.

As investment in digital infrastructure continues to grow and economic digitization advances in the Middle East, we have re-established efficient business teams to better meet the needs of regional customers. Our regional teams collaborate closely with our headquarters in Germany and customer service teams worldwide, supported by production and supply bases in over 30 locations. Our commitment remains focused on enhancing customer satisfaction and implementing our global growth strategy— 'Think Global, Act Local.'

What growth strategy does the Rosenberger Group employ, and what are its plans for expanding into the Middle East and Africa markets?

Our mission is to be acknowledged among the technology and innovation elite of our sector. The most modern manufacturing technology, the highest possible levels of efficiency in production, and continuous development are our core competencies and guarantee not just fast delivery and strict adherence to delivery dates, but also facilitate the highest demands on product quality. On a corporate, strategic level, we aim to keep our growth momentum at a steady rate, while maintaining cost efficiency efforts with increased vertical integration and operation efficiencies in all our production facilities, to increase profitability.

Despite the increased global competition, localization initiatives, and disruptions in the supply chain, our growth challenge needs to not only defend our current global market share but also increase it. The surge of digital transformation, smart cities, and data consumption worldwide will reportedly enable the electronic equipment and telecom equipment manufacturing markets to grow by a CAGR of around 9% and 6.9% respectively until 2030.



The second from the right is Olaf Scale, Regional CEO of Rosenberger Asia Pacific, MEA.

This will not only stimulate our R&D capabilities to innovate more and release more innovative and competitive products but also enhance our operational efficiency.

In 2021, Rosenberger established its first manufacturing subsidiary on the African continent—
Rosenberger Tunisia— specializing in telecommunications, automotive connectors, and cable assemblies.
Committed to meeting the highest quality standards, Rosenberger Tunisia produces reliable products to fulfill customer requirements. Our team continually evaluates opportunities to expand facilities in the region to meet the growing demand.

Which key products do you intend to emphasize as part of your expansion plan into the Middle East and Africa?

While it's true that global, high-tech companies depend on the precision and reliability of Rosenberger's high-quality products, we strategically invest in continuously developing new products. This investment focuses on leveraging the most advanced manufacturing and



Regional CEO Olaf Scale
highlights the strategic value of
Rosenberger's expansion and
re-establishment in the MEA
market, which is considered
as untapped growth territory
for the company. We have
onboarded a dedicated new
team to spearhead our efforts
in the MFA







Olaf emphasizes that our growth strategy in the MEA region involves expanding and fortifying our local sales presence in key cities, starting with Dubai



Rosenberger offers comprehensive high-performing site infrastructure solutions.

business processes, whilst also prioritizing resource conservation and environmental protection. When targeting the Middle East and Africa markets, our initial focus will be on the following product segments:

High Performing Rosenberger Site Solutions

The ongoing exponential demand for wireless networks means mobile operators are under constant pressure to increase capacity. Faced with the prohibitive costs of building new sites. the preferable solution is to improve existing ones. This invariably entails working within limited physical space. At the same time, with the addition of more antennas and connections. keeping Passive Intermodulation (PIM) as low as possible is a prerequisite. Fit-for-purpose connectors, fully optimized for these challenging environments, now play an increasingly pivotal role in ensuring the high-performance transmission of Radio Frequency (RF) signals between base stations or remote

radio heads and antennas. Selecting the right connectivity products and solutions (between the BBU/CU/DU, RRU/AAU and antenna) is an essential element to achieve the best network performance.

Rosenberger is committed to developing and supplying the most reliable fiber optic, RF, coax, power and data cabling infrastructures to meet today and tomorrow's mobile network requirements. Rosenberger provides and up-to-date site connectivity solution which covers both macro cell sites and small cell sites. Rosenberger will help the telecom vendor and operators to realize its target: high capacity, large bandwidth, security and reliability, low latency, and high quality with effective cost. Globally present, the Rosenberger Site Solution offers extensive local support, establishing Rosenberger as a partner instead of a supplier.

Our CellMax high-gain antennas increase base station range and

usable network capacity by minimizing interference, improving load-balancing and eliminating PIM, allowing carriers to get the most value from their investment in network and spectrum. They improve KPIs such as drop call rate, call set-up success rate, data throughput, total traffic and more. The increased antenna efficiency and hence, higher gain—enables significant improvements in urban, rural, and cell-Edge coverage. In an urban environment, the cell Edge is often located indoors and in the center of a cell's geographical coverage area. At rural sites, it can be at the cell's maximum range. This improved efficiency has an impact on both uplink and downlink speeds. CellMax high-efficiency antennas are based on a unique, patented technology that allows for 2dB-3dB (56%-100%) higher gain compared to antennas based on traditional technology. This offers up to a 44% geographical coverage increase - equivalent to adding 30% more sites compared to traditional antennas.

Rosenberger Data Center Cabling Solutions

For more than 30 years, Rosenberger has been a trusted provider of highly reliable data center cabling solutions across diverse industries including finance, telecommunications, government organizations, and manufacturing, among others, From medium-sized businesses to Fortune 500 companies, these enterprises rely on Rosenberger's Data Center Cabling Solutions for outstanding performance, reliability, and security in critical data center applications. The introduction of Rosenberger's Pre-Connect trunk system has been pivotal in shaping cabling architecture, reflecting decades of industry-leading expertise in pioneering data center solutions

As a trailblazer in data center infrastructure cabling, Rosenberger led the industry with the launch of 400G data center cabling solutions in 2019 and continues to innovate with intelligent cabling solutions (including low loss, ultra-low loss, and ultra-high density options) to expedite the deployment of 400G/800G networks.

With the proliferation of technologies such as artificial intelligence (AI), big data, and cloud computing, the demand for computational power has surged exponentially, presenting both opportunities and significant challenges for data centers.

Rosenberger remains at the forefront of the industry, maintaining world-class standards in areas such as data center cooling requirements, space utilization, and construction efficiency.

Contactless Data and Power Transmission – RoProxCon

Due to increasing automation, more and more electromechanical systems used in industrial plants are being connected to one another. Cables and plug contacts are often under considerable stress, causing cables to deteriorate or even break, and overused plug contacts to fail, resulting in machine downtime. The advantage of contactless transmission is that inflexible electromechanical couplings are no longer required, while radio

technology offers a high degree of additional flexibility. For example, at times when systems need to be changed. Previously, however, wireless transmissions using Bluetooth, WLAN, wireless IO-Link, ZigBee, etc. have not always met all the requirements.

RoProxCon is an innovative connection system that bridges construction-related air gaps with high interference immunity. This transmission, realized by radio transceivers in the mmWave range, offers advantages in applications where there are high requirements for low maintenance and freedomfrom-wear. With RoProxCon, existing applications can be improved whilst also facilitating the creation of new solutions for previously unrealizable scenarios.

Rosenberger SPE: An Infinite Number of Applications

Single Pair Ethernet (SPE) sets new standards in intelligent communication architecture. Using Power over Dataline (PoDL), parallel high-performance data and power transmission is supported via just one Ethernet wire pair. Originally developed for automotive applications. SPE now delivers the perfect balance of speed, distance, and power delivery for a wide variety of IoT projects. Based on familiar Ethernet and TCP/IP protocols, SPE extends the reach of Ethernet everywhere-including to sensors in the most remote corners of the plant or out in the field. PoDL ensures sufficient wattage output is readily available for powering numerous IoT components and sensors.

Driven by the growing networking demands of IoT and Industry 4.0, the combination of high transmission performance and compact size makes single-pair Ethernet the ideal solution for wired communication infrastructure.

As the world embraces the digital era, Rosenberger's high-performing connectors and solutions are poised to play a pivotal role in driving this global trend forward. In the Middle East and Africa, Rosenberger sees

vast growth potential, establishing local sales teams and strategic partnerships. Key products for expansion include site infrastructure solutions, enterprise network solutions, data center cabling solutions, and contactless data and power transmission technologies. These solutions not only meet the evolving needs of customers but also embody Rosenberger's commitment to precision, reliability, and endless pursuit of innovation.

Looking ahead, Rosenberger remains steadfast in its mission to be acknowledged among the technology and innovation elite of the industry. With a relentless focus on research and development, operational efficiency, and customer satisfaction, Rosenberger is poised to shape the future of connectivity solutions and drive sustainable growth in the Middle East, Africa, and beyond.



Our regional teams work
closely with German
headquarters and global
manufacturing sites,
supported by customer
service centers in 30+
locations, implementing
our 'Think Global, Act Local'
policy





Advancing Digital Innovation in SMBs: From Disruption to Transformation

There has never been a time in history that has witnessed the evolution of start-ups and small and medium-sized businesses (SMBs) in the digitally powered way we are experiencing today. Digitalization is good for business and the planet, and businesses are learning how to adopt it, use it, and thrive.



ccording to a global study, 92% of SMBs believe digital transformation is crucial for their business. The

question is, what are they doing to sustainably harness the power of digital? While technology updates are a hot topic and businesses are keen to leverage the benefits of Artificial Intelligence (AI), big data, cloud and the Internet of Things (IoT), the question of "how?" is not as easy.

Digital Adoption: Growth in SMBs

Over the past few years, SMBs have accelerated the adoption of digital technology in various aspects of their

businesses, resulting in a profound impact.

Globally, similar to the Middle East, there has been a significant interest in digital technologies between 2019 (pre-COVID-19 period) and 2021. The pandemic reshaped industries and accelerated the adoption of remote work. As a result of their resilience and adaptability, SMBs were compelled to leverage technology for collaborative work, reduce overhead costs, lower carbon emissions, and embrace flexible work arrangements.

Simultaneously, the rise of online shopping led SMBs to digitize their operations. E-commerce platforms have become the bridge connecting businesses with a vast digital marketplace. A recent report estimated that the region's e-commerce sector will reach a market volume of USD 50 billion by 2025.

SMBs today recognize the important role of social media and are strategically embracing these platforms to enhance their online presence, engage with customers, and reach a broader audience. In addition, they have good access to technological advancements that were once the domain of large enterprises. SMBs are adopting CRM systems, AI-powered customer support solutions and feedback management tools to meet customer expectations and improve their experience.

Sustainability Challenges in Technology Adoption

Despite the accessibility and strong desire to transition to digital, not all SMBs have the capacity to undertake this transformation. SMBs generally lack clear strategic goals and practical paths. They face challenges in digitally-based eco-innovations, business capacity building, and talent training (particularly regarding telecom and digital services).

Limited budgets make it difficult to invest in infrastructure, equipment, and connectivity. Lack of in-house resources and expertise further hampers the organization's ability to navigate complex technologies, from managing networks sustainably to optimizing digital marketing strategies. Scalability, a crucial aspect of SMB growth, poses its own challenges, requiring solutions that can flexibly adapt to evolving business needs.

Growth through Digital Innovation

The world is paying attention to the UAE as it progresses with its strategic sustainability goals to lower carbon emissions through scientific innovation and technological advancements. Following in the country's footsteps, e&'s transition from a telco to a technology group is rooted in a digital-first mindset to drive sustainability for its customers and the communities it operates in.

In serving SMBs, at etisalat by e&, we utilize technology, analytics, and innovation to deliver exceptional experiences and services sustainably through a customer-centric culture and data-driven insights.

We understand the challenges SMBs face when transitioning towards digitalization. We recognize the impact of having limited budgets, so our solutions are built using an OpEx model. Why? So that businesses do not have to invest in upfront costs and can opt for monthly payments instead.

We offer SMBs various scalable and managed solutions that cater to their requirements while saving them from investing in in-house resources and expertise. An example is the recently launched, managed 'Wi-Fi as a service' that addresses the specific demand of SMBs for Wi-Fi connectivity throughout their premises.

To digitally empower businesses with a robust platform for brand enhancement, we introduced an all-new business proposition—Business Pro— which enables the modern workplace with business and user benefits. We also launched uTap— a payment solution that aims to help businesses of all sizes with

omnichannel payment management and business automation solutions to make payment transactions seamless for SMBs.

As the SMB landscape undergoes a profound shift, etisalat by e& stands as a reliable partner for businesses in the UAE. Through innovative solutions, a commitment to customer experience, and a strong presence in the evolving digital landscape, we are committed to empowering SMBs to navigate and thrive sustainably in the digital ecosystem of the future.

By Esam Mahmoud, SVP SMB, e& UAE



e&'s transition from a
telco to a technology
group is rooted in a
digital-first mindset to
drive sustainability for its
customers





ZOI: A One-Stop-Shop for International Hyperscalers and Submarine Cables Highlighting the company's unique selling point and its contribution in establishing GCC as the next international hub, Telecom Review had an exclusive interview with Sohail Qadir, CEO, Zain Omantel International (ZOI) during Capacity Middle East 2024.



Since our inception, almost a year ago, we started a transformative journey leveraging the combined strengths of Zain and Omantel across 8 countries under a consolidated international network. This allowed us to offer a wide range of services including — roaming, SMS, voice, data, connectivity and internet— directly benefiting our operational companies (opcos). But our main vision is to operate as a wholesaler for the whole region and beyond, providing services for international companies and partners.

As we expand our network, starting with Muscat and Salalah in Oman and extending to Saudi Arabia and beyond, working with our shareholders and partners Zain Group and Omantel. Towards the end of this year, we expect the data center in Salalah (SN1) with Omantel to be up and running and provide services with our partner Equinix. We're also planning a data center in Riyadh with Zain KSA, and looking into a data center project

in Jordan with Zain Jordan. We are also deploying a network in Jordan, with network expansions underway in Kuwait, Bahrain and Iraq.

Our network serves up to 60 million subscribers; providing access to all international operators and hyperscalers to the region. We are planning to deploy a submarine cable network that will connect key points across Asia, Africa and Europe.

We are building multiple data centers across the region, which are designed to operate seamlessly, offering a one-stop shop for all international hyperscalers, and submarine cable systems. Submarine cable systems from Asia will land in Oman and the submarine cables systems from Europe will land in Saudi Arabia, and from there, they will have full access to the carrier neutral data centers.

On other fronts, the integration of teams and networks on the roaming and voice side is something that we have already accomplished.

Our aim is to make the Middle East a global digital hub. We are tirelessly working towards achieving this by 2025

Given the substantial investments and advancements in subsea technologies, what strategy has ZOI devised to leverage these global trends effectively?

ZOI is one of the major investors in the subsea industry. As of today, ZOI has access to more than 20 international submarine cable systems. These are submarine cable systems that we have direct investments in—and 4 - 5 more systems are coming in the near future. Hence, around 25 submarine cable systems will be landing in our region. We also have investments in other submarine cable systems that are crossing the Pacific and Atlantic oceans.

Due to the submarine cable systems that have created our huge ecosystem, there is an attraction. New submarine cable systems will have open access to other cable systems.

As an example, we are partners with Equinix. This partnership of carrier-neutral data centers allows submarine cables direct access to data centers.

We have created what I would say Europe created 10 years ago. We're creating the same model; not only in one country, but the whole region. The beauty of Zain Omantel International is that we have access to eight countries which are Oman, Saudi Arabia, Jordan, Iraq, Bahrain, Kuwait, Sudan and South Sudan.

We see an increasing number of wholesale players who are growing in the region with the aim to become global players. What differentiates ZOI in relation to the rest?

There are a number of ambitious players in the market. We distinguish ourselves through synergy and collaboration, which fosters a vibrant ecosystem where partnerships enhance our capabilities.

What differentiates ZOI from the rest is our one-stop-shop model; a single-supplier offering services across 8 countries to the world. ZOI delivers end-to-end services as one company, which means the customer has to deal with one network operational center. If a client encounters any issues across our 8 countries, it's one team who will deliver the services to them. That gives a lot of trust and instills confidence in others to work with us.

In 2024 and beyond, how will ZOI help in positioning the GCC as the next global connectivity hub?

The GCC's location naturally makes it a future global digital hub; be it for logistics, business, or for telecommunications and digitalization. There are three hubs that we can define: Europe, Southeast Asia, and the Middle East (which is taking over that hub position instead of other countries on the route).

Geographically talking, two of ZOI's countries are very well located— Saudi Arabia (within the borders of Red Sea and Arabian Sea) and Oman (touching the Arabian Gulf and Indian Ocean. With this combination of locations,

we're already a hub. What needs to be implemented is more data centers, a little more connectivity, and a huge integration with each other.

I believe it's a natural growth wave that the GCC, in the Middle East, will result in creating the biggest wholesale hub in digitalization, and we are playing a role in it. We have very respectable names who are working with us. This whole integration of ecosystems will hopefully place the Middle East as a hub for the international world.

Most of the hyperscalers are moving into our region, some of them are deploying their own data centers and some are using the data centers that we have deployed. Next, they will bring their network nodes over here, with more AI data centers expected in the region. It's a journey which I believe will become more visible in the next few years.



What differentiates
ZOI from the rest is our
one-stop-shop model; a
single-supplier offering
services across 8
countries to the world





Nokia: Building a Digital and Sustainable Future in the Middle East

In an exclusive interview with Telecom Review, Mohamed Samir, Vice President of Mobile Networks, Middle East at Nokia, delved into the company's 2023 milestones, the current market dynamics, the latest mobile network innovations, and the importance of the enterprise market. Additionally, he highlighted the impact of AI on businesses and the society, and shared Nokia's ESG priorities.



ould you please share some key achievements for Nokia in the Middle East in 2023? Nokia, overall, grew net sales by 8% in constant currency in the Middle East and African market in 2023. In the Middle East, mobile networks gained significant market share across many countries. To give you a concrete example, Nokia was selected for nationwide 5G network rollout by both Orange and Zain in the Kingdom of Jordan. These achievements are a strong testimony of the trust our customers put in Nokia's technology and delivery capabilities and supports our ambition to be the preferred partner for our customers.

What are the market dynamics that you are currently observing in the Middle East?

The Middle East is a very diverse region. If we look at the GCC Countries, we see 5G quickly becoming the dominant technology, taking over 4G – and it is expected to grow from 23% adoption in 2023 to 85% in 2028. For the rest of the Middle Eastern countries, 4G is expected to carry 61% of the traffic by 2028, while 5G adoption will be more gradual and will reach 14%. Overall, we also expect subscribers to grow at a CAGR of 4.6%, adding 128M subscribers to the networks during the same period. So, there are many growth opportunities to address to build a digital and sustainable future in the Middle Fast

What are the latest mobile network innovations you are introducing to the Middle Eastern market?

To address the growing business and connectivity requirements of our customers, Nokia is driving a wave of innovation in the Middle Eastern market, bringing cuttingedge technologies to add efficiency, flexibility, and scalability to the networks.

- Cloud RAN acts as the foundation, leveraging software-defined infrastructure to adapt to everevolving needs.
- This flexibility is amplified by Multi-Access Edge Slicing, which carves out dedicated network slices for diverse applications, from smart cities to the industrial IoT.
- Finally, 5G-Advanced RedCap unlocks the full potential of 5G by reducing the complexity and cost of 5G connectivity, unlocking new revenue streams in the Internet of Things (IoT), wearables and Industry 4.0 sectors.

How important is the enterprise market for Nokia?

The enterprise market is a strategic priority for us as we strive to secure a leadership position with digital enterprises. This segment now represents over 10% of our global annual sales and it's growing. Embracing connectivity presents

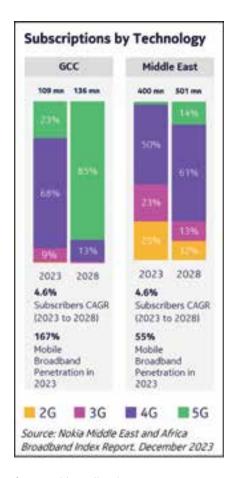
significant advantages, especially in heavy-industrial sectors such as manufacturing, oil and gas, mining, and logistics. Digitalization plays a pivotal role in bolstering industry sustainability, leading to decreased waste, enhanced resource efficiency, and heightened productivity, not to mention improved workers' safety.

Notably, private wireless networks empower industrial customers to establish campus networks tailored to their unique specifications. For instance, Arçelik— the global leading consumer durables and electronics manufacturer- achieved a remarkable 25% efficiency boost and reduced energy consumption for automated guided vehicles through the deployment of a private wireless network in Turkey, in collaboration with Nokia and Türk Telekom. We are now seeing a growing interest in the Middle East for private wireless deployments.

How can businesses and society benefit from artificial intelligence (AI)?

The AI revolution is underway and will profoundly change our lives and how we work. Many companies, governments, and other organizations in the Middle East and around the world are investigating, testing, developing, and using AI. AI is already helping service providers streamline their operations for increased network performance, efficiency, and security, as well as improving energy efficiency and customer experience.

Further down the line, AI-based capabilities are huge research topics for discussion in the 6G standardization process. For businesses and industries, AI will increasingly supplement human intelligence, allowing workers and leaders to make better decisions, increase productivity and competitiveness, and develop more effective, agile, and sustainable business and operation models. At Nokia, we are embracing responsible Al as a fundamental technology in the development of our products and services, driven by strong research



from Nokia Bell Labs over many years.

To conclude, could you please share some of your ESG priorities?

Today, one of our key priorities is to continuously improve the energy-saving features in our radio network products and reduce energy consumption and the cost of energy for our customers. Our long-term target is to reach net zero greenhouse gas emissions by 2040. We are working closely in the Middle East region with our ecosystem of local partners, suppliers, and customers towards that goal.

Another key area of focus for us is to further promote inclusion and diversity. We have therefore partnered with UN Women and many of our customers in the Middle East to bolster gender equality and women's empowerment, in addition to promoting STEM (science, technology, engineering and mathematics) education to younger girls in many of the countries in which we operate.



Vodafone Oman: Pioneering Oman's Digital Transformation

In an era where the telecommunications sector transcends its conventional role of providing mere connectivity, its significance in shaping the digital landscape cannot be overstated. Across the Middle East, we see operators racing to lead this digital transformation, shedding their legacy processes, systems and infrastructure along the way.

owever, in the Sultanate of Oman, the story is different. Home to Vodafone Oman, one of the region's first greenfield digital operators with a 5G network, customers across the nation have leaped into the digital era; enjoying cutting-edge technologies with unprecedented speed and agility from day one.

Guided by the foresight of Oman's 2040 Vision for economic prosperity, Vodafone stands out as a beacon of innovation, leveraging its unique position as a new generation techtelco to revolutionize the industry. In its second year of operations, it has successfully empowered customers with truly differentiated digital experiences thanks to its sustainable practices, unparalleled customer service and game-changing scalable 5G capabilities.

As the Sultanate's first 100% digital telecom operator, Vodafone embraced the ethos of 'dreaming big' for Oman. Harnessing its global expertise and cloud-based infrastructure, Vodafone Oman emerged as a pioneer in the deployment of 5G technology from day one. This strategy underscores the company's commitment to staying ahead of the curve in an increasingly digitized world. By embracing cuttingedge technology and fostering a culture of innovation, Vodafone Oman is not

only meeting current demands but is also future proofing its operations for the challenges and opportunities presented by the Fourth Industrial Revolution.

A Dynamic Year of Growth and Innovation

2023 was pivotal for Vodafone in Oman, marked by dynamic growth across its infrastructure, product portfolio and customer base. Steadfast on delivering its promise for Oman, the company continued to evolve as a leading tech-telco, confidently achieving objectives, overcoming challenges, and receiving wholehearted support from partners, communities and customers.

Committed to transforming lives through technology, the company set a record with a 105% expansion of its 5G network presence and a 120% increase in population coverage. Furthermore, Vodafone Oman's expansion extended beyond domestic boundaries, enhancing outbound coverage to 220 networks. These efforts have solidified the company's position as a leading telecom provider, with a clear vision to digitalise all aspects of the Omani way of life.

Moreover, the company's digital capabilities, unique infrastructure and technological scalability set yet another record when Vodafone Oman became amongst the first in the world to offer post-paid packages that allow for full digital onboarding thanks to eSIM activation in less than two minutes via its award winning My Vodafone App.

Sustainable at Heart

At the heart of Vodafone Oman's operations lies a deep commitment to sustainability. Unlike traditional telecom operators, Vodafone Oman has integrated sustainability into the very fabric of its business model, adopting a holistic approach to minimize its environmental footprint while maximizing social and economic benefits.

The Vodafone state-of-the-art 5G Next Level network thrives on a welldesigned, efficient infrastructure, ensuring seamless support for cloud-



based operations, giving users the best performance. Powered by only four racks, it sets a groundbreaking standard for eco-conscious telecom networks. In addition, it's kinder to the environment, using cleaner energy sources and smarter power management.

Another notable aspect of this commitment is the company's strategic approach encompassing leasing tower capacity from local entities, instead of building its own telecom towers. By maximizing site sharing and leveraging partnerships with state-owned companies, Vodafone Oman has not only reduced its environmental impact but has also continued to contribute to the development of a sustainable economic ecosystem in Oman.

Its contributions have continued to grow from strength to strength through significant in-country spending and partnerships with local businesses and SMEs. Over the last two years, the company has generated hundreds of direct and indirect jobs, prioritized national investment and fostered local talent development; thereby enabling greater social and economic impact on every level.

As the telecommunications landscape continues to evolve, Vodafone Oman's proactive stance serves as a testament to the transformative power of innovation in driving progress. Through its forward-thinking initiatives, Vodafone Oman is not only reshaping the telecom industry in Oman but also paving the way for a more connected, efficient, and prosperous future for the nation.



Vodafone stands out as
a beacon of innovation,
leveraging its unique
position as a new generation
tech-telco to revolutionize
the industry





Meet Hicham Siblini: The Visionary CTIO Leading Asiacell's Technological Innovation

Hicham Siblini, the visionary CTIO of Asiacell, leads the company's technological innovation with a wealth of experience. In an exclusive interview with Telecom Review, he focused on network infrastructure, digital transformation, and cutting-edge solutions that are driving Asiacell to excellence.

hat are the challenges and achievements of building such a powerful network in Iraq?

Asiacell overcame challenges in building Iraq's telecom network, addressing security concerns and regulatory complexities. Our determination led to remarkable milestones, with 4G+ coverage in all governorates, reaching 99.06% of the population. Continuous investment in technologies like VoLTE and IoT has positioned us as pioneers, delivering top-notch data services nationwide.

Asiacell was the first to launch 4G LTE services in Iraq. Why was there a delay when introducing 4G in Iraq? How has the introduction of 4G impacted the telecommunications sector's development and the economy?

As the first to launch 4G LTE services in Iraq, Asiacell overcame delays in 4G adoption. Despite regulatory challenges, our proactive approach has been a game-changer, propelling the telecommunications sector's growth. Introducing 4G technology has not only enhanced connectivity but also acted as a catalyst for economic advancement, fostering innovation and

efficiency across industries for positive economic outcomes in Iraq.

How is Asiacell preparing for 5G readiness and the potential use cases in Irag?

Asiacell is actively preparing for 5G readiness through trials, tests, and collaboration with regulators, vendors, and partners; achieving speeds showcases our commitment. By collaborating with the Communications and Media Commission (CMC) to secure necessary spectrum and licenses, we're exploring potential use cases like smart cities, agriculture, healthcare, education, transportation, and industry to usher in a new era of connectivity.

How can Asiacell incorporate AI as a new driving force in its technological operations?

Al integration at Asiacell is a strategic move to enhance network performance, customer experience, and business efficiency. Al monitors, analyzes, and optimizes network parameters, ensuring traffic, capacity, quality, and reliability are at their peak. Personalizing products and services based on customer behavior, automating processes, and innovating new solutions are all part of our Al-driven approach, positioning Asiacell at the forefront of technological innovation.

What distinguishes Asiacell's eSIM service, and what benefits does it offer?

Asiacell's eSIM service revolutionizes activation without physical insertion, offering compatibility with various devices. It allows seamless plan switching and multiple SIM card use on a single device, ensuring robust security measures against theft and unauthorized access. Users enjoy flexibility across devices and international usage, eliminating roaming charges. Asiacell's eSIM blends advanced technology with user convenience for a comprehensive communication solution.

How does the company navigate the dynamic and competitive market to leverage technological resources effectively?

Our strategy is rooted in rigorous market research to understand trends and customer needs. We maintain a proactive stance by investing in emerging technologies and launching products aligned with market demands. Continuous monitoring and evaluation ensures the effectiveness of our initiatives, allowing for adaptation to market dynamics. This commitment to strategic agility and improvement positions us to thrive amidst competition, sustaining our edge in the technological landscape.





The Evolution and Impact of Mobile Financial Services

In the past decade, mobile financial services (MFS) have transformed the landscape of financial transactions, making it easier, faster, and more accessible for people around the globe to manage their money. This transformation is particularly significant in developing countries, where traditional banking infrastructure is sparse, but mobile phone penetration is high. From mobile banking to mobile wallets to peer-to-peer transfers to microloans, MFS have become a cornerstone of economic activity for individuals and businesses alike.

obile financial services refer to any financial service performed via a mobile device, including banking services, payment transfers, and mobile money solutions. The inception of MFS can be traced back to the early 2000s, with the launch of M-Pesa in Kenya in 2007 often cited as a pivotal moment. M-Pesa allowed users to deposit, withdraw, and transfer money, and pay for goods

and services easily through a mobile device, without the need for a bank account. This innovation showcased the potential for mobile technology to revolutionize financial access, especially in regions with limited banking infrastructure.

However, the proliferation of mobile financial services (MFS) not only transforms the financial sector but also offers a myriad of benefits for mobile operators. By building a comprehensive MFS solution, mobile operators can tap into new revenue

streams, enhance customer loyalty, and significantly expand their market influence.

Benefits for Mobile Operators in Developing Mobile Financial Services
The integration of mobile financial services offers mobile operators a transformative opportunity to evolve beyond traditional telecom services. By building an ecosystem that includes MFS, operators can enhance customer loyalty, encourage new revenue streams, and position themselves as indispensable partners

in their customers' financial lives. The strategic development of MFS solutions enables operators to not only face the challenges of a rapidly changing telecom landscape but also thrive within it, leveraging their unique position to become central figures in the digital economy. Below, are the multifaceted benefits that MFS bring to mobile operators in more detail:

· Building an Ecosystem

One of the most significant advantages for mobile operators delving into MFS is the creation of a holistic digital ecosystem. This ecosystem encompasses various services beyond traditional telecom offerings, such as payments, loans, savings, and insurance. By integrating these services, operators can become central to their customers' daily lives, facilitating everything from routine transactions to financial planning. This integration encourages constant engagement, deepening the customeroperator relationship.

Enhancing Loyalty Programs

MFS enable mobile operators to offer enriched loyalty programs. By integrating rewards directly with financial services, operators can incentivize customer behaviors in more nuanced and compelling ways, such as offering cashback on mobile wallet transactions, discounts on bill payments made through the app, or better interest rates for savings. These programs increase customer loyalty and enhance the perceived value of the operator's offerings.

• Financing Devices Directly

Following the advent of MFS, operators have the opportunity to finance the purchase of mobile devices directly. This approach can significantly boost device sales, as customers can spread the cost over time, making smartphones more accessible to a broader audience. Financing also ties customers to the operator for the duration of the repayment period, reducing churn.

Creating Additional Revenue Streams

MFS introduces new revenue streams for mobile operators. Transaction fees,

interest on loans, and premiums on insurance products contribute directly to the bottom line. Additionally, by offering a suite of financial services, operators can tap into markets previously dominated by traditional banks and fintech companies.

Accessing a Larger Share of Wallet

By offering comprehensive financial services, mobile operators can capture a larger share of their customers' wallets. This means that a greater portion of customers' spending and financial activity flows through services controlled by the operator, from daily purchases to savings and investments. This not only increases revenue but also provides valuable data on customer behavior, enabling further customization and cross-selling opportunities.

Reducing Customer Churn

MFS are a powerful tool for reducing customer churn— a perennial challenge in the telecom sector. By embedding themselves more deeply into customers' financial lives, operators make it more cumbersome for customers to switch providers. The convenience and benefits of using a single platform for both communication and financial transactions create a strong incentive for customer loyalty.

Leveraging Billing and Distributor Finance

MFS also offer operators the chance to streamline their own billing processes. By encouraging customers to use mobile money for bill payments, operators can reduce the cost and complexity of bill collection. Furthermore, MFS can be used to finance distributors or retail partners, ensuring smoother operations and potentially increasing sales channels' efficiency and reach.

Implementing Mobile Financial Services for Mobile Operators

As demonstrated previously, implementing mobile financial services (MFS) presents telecom operators with a significant opportunity to diversify their offerings and deepen their customer engagement. However, the journey from conceptualization

to the execution of MFS follows various paths, each with its own set of advantages, challenges, and strategic implications. The following are practical approaches telecom operators can take, ranging from building their own greenfield MFS platforms to leveraging white-label solutions.

Own Greenfield Build

A greenfield build refers to the process of creating a new MFS platform from scratch. This approach allows telecom operators to design and develop a customized solution that aligns perfectly with their strategic objectives, brand identity, and customer needs.

Implementation Steps

- 1. Strategic Planning: Define clear objectives, target market, and the range of financial services to be offered (e.g., payments, savings, loans).
- 2. Regulatory Compliance: Engage with regulatory bodies to ensure the service complies with all legal and financial regulations.
- 3. Technology Infrastructure: Develop the necessary technology infrastructure, including secure payment gateways, user-friendly mobile apps, and robust backend systems.
- 4. Partnerships: Form partnerships with banks, financial institutions, and other service providers to offer a wide range of services.
- 5. Customer Experience Design: Focus on creating an intuitive and seamless user experience.
- 6. Marketing and Launch: Develop a comprehensive marketing strategy to promote the new service and onboard customers.

Leveraging White-Label Solutions

White-label solutions involve partnering with a third-party provider to use their pre-existing MFS platform, branded under the telecom operator's name. This approach can significantly reduce development time and cost.

Implementation Steps

1. Market Research: Identify the most suitable white-label platform that aligns with the operator's goals and customer needs.

- 2. Vendor Selection: Choose a whitelabel provider with a proven track record, robust security measures, and comprehensive support services.
- 3. Customization and Branding: Work with the provider to customize the platform's look and feel to match the operator's branding and incorporate any specific features required.
- 4. Integration: Integrate the whitelabel solution with the operator's existing systems, such as customer management and billing systems.
- 5. Regulatory Approval: Ensure the solution meets all regulatory requirements, with the provider's assistance if necessary.
- 6. Launch and Marketing: Roll out the service to customers, supported by targeted marketing campaigns to drive adoption.

Hybrid Approach

A hybrid approach combines elements of both greenfield development and white-label solutions. For instance, an operator might develop certain components in-house while leveraging third-party solutions for others.

Implementation Steps

- Strategic Assessment: Determine which MFS components are strategic to build in-house and which can be outsourced.
- 2. Component Development and Selection: Develop in-house solutions for core components while selecting whitelabel solutions for non-core elements.
- 3. Integration: Seamlessly integrate inhouse and third-party solutions to offer a cohesive service.
- 4. Customization and Compliance: Ensure the entire service, though hybrid, meets branding standards and regulatory requirements.
- 5. Launch and Iteration: Launch the service with an emphasis on continuous improvement based on customer feedback and market trends.

Strategic Partnerships

Engaging in strategic partnerships with existing banks or fintech companies can also be an effective way to enter the MFS market without building a solution from the ground up.

Implementation Steps

1. Partner Identification: Identify potential



partners who already offer MFS and share a mutual interest in collaboration. 2. Co-Creation and Integration: Work together to co-create a service offering that leverages the strengths of both parties, ensuring tight integration with the telecom operator's infrastructure. 3. Joint Marketing: Utilize both parties' customer bases and marketing resources for a powerful, joint go-to-market strategy.

For telecom operators, the decision on how to implement mobile financial services hinges on a variety of factors including time to market, cost, the strategic importance of customization. and regulatory considerations. Whether opting for a greenfield build, leveraging white-label solutions, adopting a hybrid approach, or entering into strategic partnerships, the goal remains the same: to deliver value-added services that enhance customer engagement and offer new revenue streams. Careful planning, execution, and ongoing management are crucial to the success of any MFS initiative.

Challenges and Future Directions

Despite their benefits, mobile financial services face challenges, including regulatory hurdles, security concerns, and the digital divide. As these services continue to evolve, addressing these challenges will be crucial for maximizing their potential.

The future of MFS lies in leveraging technologies like blockchain for greater security and transparency and artificial intelligence (AI) for personalized financial services; all while continuing to innovate

to reach underserved populations. As these technologies mature, mobile financial services are set to become even more integral to global economic systems, further transforming how we think about and manage money in the digital age. **III**

By Marco Lichtfous, Managing Director, PMP Strategy Benelux & DACH and Vivek Yadav, Managing Director, PMP Strategy MEA



By building an ecosystem that includes MFS, operators can enhance customer loyalty, encourage new revenue streams, and position themselves as indispensable partners in their customers' financial lives





Strengthening Iraq's Telecom Industry for a Brighter Digital Future

Information and communication technology (ICT) is a key driver of economic and social development in the modern world. It enables various sectors and industries to innovate and grow and supports the transition to the Fourth Industrial Revolution (4IR). One of the most essential ICT innovations is 5G—the new generation of mobile networks that offers unprecedented speed, reliability, and connectivity. 5G can transform every aspect of life; from education, health, and public services to manufacturing, transportation, and energy.

raq is a country that recognizes the potential of 5G to boost its economy and improve its citizens' well-being. A solid ICT base can help Iraq achieve its economic and social goals— as it can increase its GDP per capita by up to 60% if it reaches the levels of private sector participation, investment, human capital, and productivity of upper-middle-income countries (UMICs), according to a World Bank report. 5G can also enhance the efficiency and quality of various sectors in Iraq, such as energy, transportation, healthcare, and power supply.

The Middle Eastern nation has relied mainly on its energy resources but is now looking to diversify and digitize its economy. Iraq plans to introduce 5G technology soon and stands to gain from the experience of other Middle Eastern countries that were part of the first global wave of 5G implementation. These countries created an open and collaborative ecosystem that enabled leading 5G vendors from the west and the east to introduce advanced technology in line with global standards and best practices that enabled the public and industry to reap good quality service and multi-fold benefits.

Iraq rolled out 4G for commercial use in 2021, and there is still a lot of scope needed to strength our current 4G network. This year, Iraq's 4G network coverage is estimated to cover 97.45% of our population. From an industry standpoint, the generational cycle of telecommunications technology development is six to ten years. Therefore, before the commercial use of 5G is commenced, the construction of 4G network infrastructure must be increased. which will help achieve the optimal return on investment (ROI) of 5G.

As the implementation of 5G networks nears, we must embrace a systematic deployment approach. 5G development in Iraq can be divided into three stages. In the first stage, the country should

research global best practices and set standards of deployment. The government can conduct spectrum allocation in the second stage and initiate a pilot phase. Lastly, the final phase includes improving network construction and perfecting policies. In the future, by focusing on developing 5G business-to-consumer (B2C) and business-to-business (B2B) applications and building a converged application industry ecosystem, Iraq's deployment of 5G can help us reap numerous benefits.

Prior to the development of 5G, investing in 4G infrastructure is still worthwhile and wise for mobile network operators (MNO). On the one hand, there is still the marketing potential for enhancing the 4G network since people demand faster and more stable services. On the other hand, in the early 5G commercial use stage, operators' network competitiveness can start with 4G+5G; which means key 5G technologies can be applied to 4G networks in advance to improve network performance, to realize a smooth evolution of 5G in the future, and to protect operators' investment.

Based on the experiences from leading markets in 5G, Irag should evaluate 5G vendors based on their technical performance, quality, security, and adherence to international standards. For example, China specifically has invested heavily in 5G research and development, becoming a global leader in 5G technology. China accounts for nearly 40% of international 5G standard essential patents, while the US accounts for around 35%. The Chinese giant, Huawei, is the top 5G patent family holder with 14% of the global share, and it has spent 25.1% of its total revenue on R&D in 2022, worth USD22.1 billion. This company has not only helped leading global operators—including in the GCC—to launch 5G and utilize its advantages to create new growth horizons in many business scenarios but has also made rapid progress in offering new waves of 5G capabilities to telecom operators and all other

sectors and industries through its next generation 5G-Advanced (5.5G) capabilities.

Iraq's 5G launch can also take advantage of the well-researched industry standards such as GSMA NESAS, 3GPP, and OIC-CERT (Organization of the Islamic Cooperation — Computer Emergency Response) 5G Security Framework. The OIC-CERT 5G Security Framework systematically and comprehensively provides a common assurance mechanism for the individually-certified cybersecurity outcomes of 5G networks and services among the OIC member states.

Irag's telecom operators should collaborate with telecom regulators to ensure they base their investments on business growth and the value they can create for other sectors and the national economy. Our country's growing tech-savvy population and smartphone penetration offer huge market potential for the communications industry. As the demand for digitalization increases, the demand for communication services and internet access will continuously grow. Since 2020, the information and communications industry has steadily developed. In 2022, the revenue of the communications industry reached USD2.19 billion. It is estimated that the revenue will reach USD3.27 billion in 2023.

One more key factor in accelerating the digital transformation across all sectors and industries in Iraq is narrowing down the ICT talent gap and arming the Iragi newtech generation with the required advanced skills. This can be done by creating the anticipated ICT talent ecosystem in Iraq in collaboration with all possible partners from the private and public sectors. We, as universities, should also hold an open mind in cooperating with industry contributors to nurture more young people with ICT skills, which will enable the students to be more competitive in securing job opportunities and help develop them

into future industry leaders. Iraq has an excellent opportunity to leverage 4G and 5G technology to advance its economic and social development. Undoubtedly, national Investment in the ICT industry needs to be increased. ICT technologies will shape our future digital economy, and strenathening our current telecom infrastructure will go a long way in building a solid foundation for our bright future. Therefore, developing telecom networks is critical to our economic growth and is an important cornerstone for national industrial upgrading and enterprise development.

By Dr. Ghassan Abdul-Hussein Bilal, Assistant Professor at University of Technology-Irag



Huawei is the top 5G patent family holder with 14% of the global share, and it spent 25.1% of its total revenue on R&D in 2022, worth USD22.1 hillion





The Technological Renaissance: Saudi Arabia's Journey to a Digital Future

The Kingdom of Saudi Arabia is undergoing a remarkable technological renaissance as part of its ambitious Vision 2030 initiative. With a focus on enhancing productivity, resilience, and environmental stewardship, the Kingdom is making significant strides in various sectors, particularly in industry, and information and communications technology (ICT).

he following delves into the transformative journey of Saudi Arabia, exploring how the nation is leveraging advanced technologies to diversify its economy,

foster innovation, and position itself as a global technological hub.

The Industrial Sector's Technological Leap

Since the launch of Vision 2030 in 2016, Saudi Arabia's industrial sector has experienced sustained growth,

with investments in manufacturing reaching an impressive USD 132 billion. A pivotal aspect of this resurgence is the adoption of Industry 4.0 principles, encompassing technologies such as the Internet of Things (IoT), artificial intelligence (AI), and robotics. This technological leap

aims to create more efficient, flexible, and interconnected systems, steering the nation away from oil-centric economic models.

Already yielding positive results, Saudi Arabia's manufacturing activity surged by 18.5 percent in December 2022, underscoring the nation's commitment to embracing transformative technologies. Over 2,000 new licenses have been issued, contributing to the creation of 193,000 new jobs within the industrial sector. With a vision to increase the number of factories to 36,000 by 2035, including 4,000 fully automated facilities, Saudi Arabia aims to establish a dynamic and innovative production landscape.

Information and Communications Technology Market

Valued at over USD 40.9 billion and constituting 4.1 percent of the Kingdom's GDP, Saudi Arabia's ICT market is the largest and fastest-growing in the Middle East and North Africa region. The country is strategically positioning itself as a technology service and cloud hub with access to international connectivity through the Red Sea and the Gulf.

To support Vision 2030's digital transformation goals, Saudi Arabia is actively implementing its 2023 ICT Strategy, with a focus on e-commerce, digital education, digital health, smart cities, national data, and e-government. The strategy outlines ambitious targets, including the creation of over 25,000 jobs in the sector, a 50 percent increase in the size of the IT market and emerging technologies, and a USD 13.3 billion boost to the sector's contribution to GDP.

Potential Opportunities in ICT

Here are the key opportunities of the digital innovation in the KSA:

1. Cybersecurity

Saudi Arabia, securing the second position in the IMD's Global Cybersecurity Index, is a Middle East cybersecurity leader. The market, valued at USD 3.6 billion in 2020, is projected to reach USD 9.8 billion by 2026, offering opportunities in

application security, cloud security, consumer security software, and data security. The Kingdom's commitment positions it as a key player in addressing emerging threats and fostering a secure digital environment.

2. Internet of Things (IoT) & Smart Cities

Saudi Arabia aims to become the world's most connected nation by 2030, propelling its IoT market, which is projected to reach USD 2.9 billion by 2025. With a focus on industrialized IoT, AI, cloud computing, and data centers, the Kingdom provides opportunities in predictive maintenance, asset tracking, fleet management, and warehouse optimization. This aligns with Saudi Arabia's broader vision of a highly innovative and interconnected digital future.

3. Cloud Computing

Saudi Arabia is set to significantly boost its annual spending on public cloud services, projecting a reach of USD 2.5 billion by 2026 at an impressive Compound Annual Growth Rate (CAGR) of 25 percent. This commitment to cloud technology is further emphasized by the launch of a Cloud Computing Special Economic Zone, highlighting the nation's dedication to fostering the widespread adoption of cloud services.

4. Artificial Intelligence (AI)

The kingdom anticipates a substantial contribution of USD 135 billion to its economy by 2030 through Al advancements. Opportunities lie in tailoring Al applications for the local market, especially in transforming manufacturing processes within the oil and gas sector.

5.5G

Saudi Arabia launched 5G networks in 2019, with coverage exceeding 53 percent. Significant investments in digital infrastructure have resulted in high mobile internet speeds and increased subscription rates, positioning the Kingdom as a leader in technological advancements.

6. E-Commerce

Valued at USD 5.15 billion, the Saudi

e-commerce market represents 6 percent of the retail sector. Vision 2030 targets a 70 percent shift to cashless transactions by 2030, fostering investments in digital payments and highlighting Saudi Arabia's commitment to economic modernization.

Saudi Arabia's technological advancements are propelling the nation towards a digital future, with a focus on innovation, economic diversification, and global leadership in key technological sectors. As the Kingdom continues to invest in cutting-edge technologies and infrastructure, it is poised to emerge as a beacon of technological excellence in the Middle East and beyond. The transformative journey outlined in Vision 2030 is not just a national agenda but a testament to Saudi Arabia's commitment to shaping a dynamic, technology-driven future.



The transformative journey outlined in Vision 2030 is not just a national agenda but a testament to Saudi Arabia's commitment to shaping a dynamic, technology-driven future



The Kingdom Leads MENA in E-Government Services for 2023



Saudi Arabia has once again emerged as the frontrunner in the Government Electronic and Mobile Services Maturity Index for 2023, as per the United Nations Economic and Social Commission for Western Asia (ESCWA). Holding onto its top position for the second consecutive year, the Kingdom achieved an impressive maturity score of 93 percent across the board.

H.E. Eng. Ahmed Alsuwaiyan, governor of the Digital Government Authority, attributes this remarkable achievement to the concerted efforts of government agencies in driving digital transformation. He emphasizes the unwavering support from the wise leadership, which has propelled Saudi Vision 2030 forward, fostering a digital society and leveraging cutting-edge technologies to enhance productivity and efficiency, ultimately delivering a superior experience for all stakeholders.

The Dominance of Digital Governance

The Government Electronic and Mobile Services (GEMS) maturity index evaluates 17 countries annually based on the maturity of 84 priority government services provided through portals and smart applications. Saudi Arabia stood out with a stellar performance, claiming the top spot across all indicators, with remarkable advancements in each category.

Under the Service Availability and Sophistication indicator, Saudi Arabia achieved an impressive maturity rate of 98 percent, signaling a notable increase from the previous year. In the Service Usage and Satisfaction indicator, the Kingdom scored a

high maturity rate of 84 percent, showcasing significant improvement.

Notably, Saudi Arabia attained a perfect score of 100 percent in the Public Outreach indicator, marking substantial progress from the previous year with a remarkable increase.

This accomplishment adds to Saudi Arabia's growing list of accolades in the digital realm, including ranking third, globally, in the World Bank's GovTech Maturity Index for 2022 and achieving its highest-ever ranking in the United Nations' E-Government Development Index. The city of Riyadh also excelled on the global stage, securing the fourth position worldwide in the utilization of technology and its applications.

Saudi Arabia's steadfast commitment to digital excellence continues to set new benchmarks and propel the nation towards a digitally empowered future.

Middle East's GenAl Momentum: From Upskilling to Operational Revolution



In 2023, generative AI (GenAI) emerged as a promising force poised to transform business operations, capturing widespread attention. Notably, the Middle East stands out with a distinctive approach to AI and GenAI adoption, diverging from prevailing global trends.

Middle East Progress in GenAl

Progress in GenAl within the Middle East is evident. According to a recent survey, 61% of executives foresee productivity gains exceeding 10% due to the implementation of Al and GenAl by 2024. Moreover, over half (54%) of Middle Eastern executives emphasize their current focus on practical

applications of AI/GenAI, surpassing mere experimentation to embrace comprehensive and scalable initiatives.

In the realm of workforce development, the Middle East leads in upskilling efforts related to GenAl. Nonetheless, there remains ample room for enhancement, with only 11% of Middle Eastern executives reporting that over a quarter of their workforce has received training in GenAl tools. This underscores a persistent regional endeavor to equip the workforce with requisite Al skills.

Analysts assert that AI holds the potential to redefine company operations in the Middle East, thereby generating significant value for individual enterprises and broader economies. This transformative shift necessitates a 'value-first' approach and a mindset combining technology with effective change management strategies across diverse sectors.

More Investments, More Cost Savings

Furthermore, the correlation between investments and cost savings is pronounced. Among 1,406 C-level executives surveyed across 50 markets and 14 industries, 71% intend to escalate tech investments in 2024, with 85% planning to augment spending on Al and GenAl. Although a minority of companies are currently reaping the benefits of AI and GenAI, a majority are either playing catch-up or adopting a cautious stance. More than 60% of surveyed executives also revealed their firms' wait-and-see attitude towards Al-specific regulations, while a mere 6% have trained over a quarter of their workforce in GenAI tools thus far.

According to the report, organizations earmarking over USD 50 million for AI and GenAI investments in the current year are 1.3 times more likely to witness cost savings by 2024 and 1.5 times more likely to achieve cost reductions exceeding 10%.

Assessing Indoor 5G Coverage in the GCC



As the adoption of 5G continues to soar, the necessity for indoor 5G performance becomes increasingly apparent, serving as a pivotal asset for end users and a commercially advantageous asset for service providers.

In the Gulf region, operators are working towards bridging the indoor-outdoor coverage disparity. Insights from Ookla's Cell Analytics™ data have shed light on the provision of indoor 5G coverage by seven mobile operators across 28 malls situated in Qatar (Doha), Saudi Arabia (Jeddah and Riyadh), and the UAE (Abu Dhabi and Dubai), derived from crowdsourced measurements spanning from December 2022 to November 2023.

In essence, du has emerged as the frontrunner in the UAE, particularly in Abu Dhabi, while Mobily has gained prominence in Saudi Arabia, boasting superior indoor 5G coverage across a greater number of malls, and Ooredoo has taken the lead in Qatar malls' indoor coverage provision.

Indoor Coverage Improvement

Since 5G drives the majority of data usage and most of it occurs indoors, focusing on improving indoor coverage and capacity is crucial. Ericsson reports that people spend 90% of their time indoors, with up to 80% of data consumption happening in indoor settings. Therefore, by improving indoor coverage and capacity, operators can capitalize on data growth, decrease churn, and accommodate new consumer and business use cases.

Importance of Indoor 5G Coverage in Malls

In the Gulf region, indoor network coverage holds paramount importance due to the prevalent high temperatures and extended indoor stays, particularly in shopping centers, which serve as the hub of economic and social activity for residents and tourists.

5G connectivity within these malls is indispensable for both consumers and businesses. It facilitates various operations such as connecting video

cameras, point-of-sale (PoS) devices, and signage systems for stores, enabling a hybrid retail experience that merges physical and digital sales channels. Moreover, robust indoor 5G coverage supports future in-mall experiences integrating technologies like AR/VR, enhancing customer engagement.

Offering seamless connectivity in malls benefits operators and venue owners alike. Operators can enhance their brand image by associating with iconic venues, while landlords can differentiate their malls and potentially command higher rental rates by ensuring exceptional indoor coverage and quality.

UAE Malls Have Better Indoor 5G Coverage Than Qatar and Saudi

In the UAE, top malls generally have superior indoor 5G coverage compared to Qatar and Saudi Arabia. Abu Dhabi's malls show du outperforming etisalat by e& in indoor 5G coverage. Saudi Arabia's malls, on the other hand, host the five with the poorest indoor 5G coverage. In Qatar, Ooredoo generally provides better indoor coverage than Vodafone, with notable differences in certain malls.

New UAE-Based R&D Platform to Accelerate Innovation of Developing Nations



A new initiative, spearheaded by the Advanced Technology Research Council (ATRC), underscores Abu Dhabi and the wider UAE's commitment to nurturing inclusive growth and global prosperity through advanced research and development (R&D).

In an age of rapid technological evolution, the 'ATRC Global Tech R&D Platform,' aims to bridge the technology gap experienced by nations worldwide by offering customized solutions to their urgent needs.

The USD 200 million fund, allocated by ATRC, aims to expedite innovation, particularly in emerging and developing economies, by covering resource and research expenses. This financial support facilitates the creation of advanced technology solutions, enabling these nations to keep abreast of the latest developments.

The ATRC Global Tech R&D Platform is open to applications from governments, organizations, and eligible stakeholders globally, emphasizing collaboration and inclusivity. Projects aligned with

the platform's objectives in six key sectors—aerospace and space; food and agriculture; healthcare; safety and security; sustainability, environment, and energy; and transport—will undergo a thorough evaluation process to receive support.

H.E. Faisal Al Bannai, Secretary General of ATRC, underscored the profound global impact of the initiative, stating: "Our commitment is to empower every nation with the means to thrive in this technology-driven world. ATRC stands ready to partner with countries worldwide, leveraging our expertise in technology to address their challenges and drive collective progress in the Aldriven era."



The Battle of Content: Menace or Boon of Al Era?

Now that content generated by artificial intelligence is slowly but steadily entering the mainstream, it's a good time to assess the implications that can impact the way content is consumed or should be consumed.

enAl tools such as ChatGPT, PaLM or Claude, among others, can generate relatively well-researched written content in seconds (which would usually take humans hours or even days to compile). Al technology's computing capabilities expedite the processing time for exploring extensive data and generating prepared responses.

Similarly, in gaming, AI can create engaging games in a relatively short time and with little resources, in addition to customizing the overall gameplay experiences. Generative AI tools employ advanced machine learning techniques; deep learning models such as generative adversarial networks (GANs), variational autoencoders (VAEs), and large language models, (LLMs) among others to achieve such a feat. Once trained on volumes of datasets, these models are

capable of understanding patterns and underlying arrangements.

GenAl is set to disrupt jobs generally performed by humans as the automation of tasks takes precedence. S&P Global Market Intelligence's 451 Research VoCUL: Connected Customer, Consumer Representative survey conducted in Q2, 2023, revealed a decline in the 'mostly positive' sentiment about the impact of Al on careers among higher-education

respondents, dropping from 22% to 14% since the launch of ChatGPT last year.

Content Generation: Uncovering the Source

In recent news, The New York Times charged AI development companies, OpenAI and Microsoft, for copyright infringement over the unauthorized use of their published work to train AI technologies. The lawsuit contends that The Times' millions of published articles were used to train automated chatbots that now compete with the news outlet as a source of reliable information.

These advancements cast significant doubt on the matter of content. generation. Over the years, human writers have contributed extensively to developing a credible knowledge base for the benefit of humans by meeting the highest standards of fact-checking and research that are difficult to replicate by 'machine learning.' The creativity, empathy and expertise of human writers remain unquestioned to this day. However, GenAI tools are being trained on such datasets; while the billions of dollars in investments are being diverted to these companies without a decent compensation set aside for the actual data creators or owners.

This form of intellectual property 'misuse' has not reached an agreeable resolution so far. Ideally, such a resolution should come with a commercial agreement between GenAl companies and data creators with technological guardrails around generative Al products.

Adding fuel to the fire is the issue of 'deep fakes', which are generated by AI to create hyper-realistic images and voices of people that could easily convince the unaware audience to react to its intended provocations. In recent times, deep fake tech has been used for marketing, political satire, and entertainment. This technology facilitates the rampant and quick distribution of misinformation, especially those associated with acts of cyber warfare. Furthermore, the amount of confusion deep fakes

can inject into already-complicated electoral processes, political campaigns and hate-mongering around the globe is uncomfortably numbing.

No Bars on Innovation

Despite the apparent notion of GenAl displacing humans in various aspects of work or jeopardizing societal perceptions, the unlimited potential of the technology across sectors should not be left unexplored. GenAl's proficiency in generating new content, leveraging natural language processing and multimodal interaction (text, image, voice, etc.), enables it to mimic human thinking and interactions.

An illustrative example is its application in overcoming language barriers in business communication. Frequently, individuals speaking different languages struggle to comprehend each other during business discussions, leading to a form of 'communication chasm.' However, with the help of GenAI, some phones and video conferencing devices come with real-time language translation features. Hence, any conversations in native tongues can be interpreted in the participant's preferred language. Such innovation has the potential to completely transform business communication models. GenAI has the potential to facilitate greater participation in global communities by producing digital content accessible to non-English speakers. This could catalyze inclusive global growth driven by digital transformation.

In the UAE, the potential of GenAI has been well-realized. During a global economic session, Omar bin Sultan AI Olama, the UAE's Minister of State for Artificial Intelligence, Digital Economy, and Remote Work Applications, recognized GenAI as "the driving force of the future digital economy." He underscored the importance of "cultivating digital skills" and ensuring the "agility of talents to adapt to new technologies to keep pace with global changes."

Developing Guardrails for AI

The role of the telecommunications sector in ensuring a robust digital

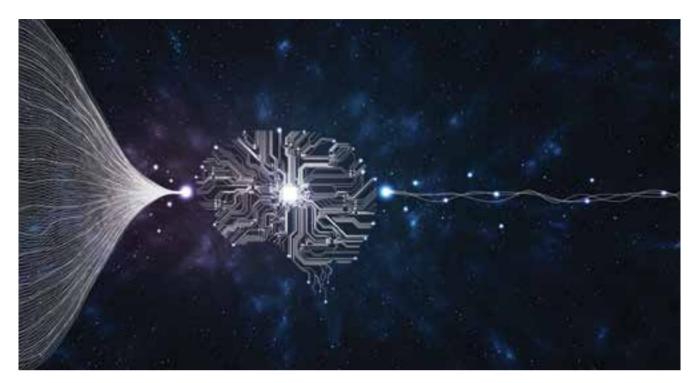
infrastructure to harness the potential of GenAl cannot be underestimated. Adaptable legislative frameworks demand a concerted effort from both the public and private sectors to solidify mutual economic prosperity. Technological companies can leverage the potential of GenAl in this pursuit.

Since the technology is evolving, developing permanent guardrails may not be practical at this point. However, the industry stakeholders, including governments, telecom operators and regulatory bodies must not stop exploring and studying the challenges and potential opportunities of cutting-edge technology such as AI.

The EU has released the AI Act— the world's inaugural comprehensive AI law. It is anticipated to define rules, obligations for providers and users, and categorize various risk levels, as outlined by the law. Even China and the US have come up with laws regarding AI that aims to provide the necessary restrictions to companies providing GenAI services. However, the scope of regulating AI is understandably wide-ranging given the geographical, technological and cultural differences across the globe.

Despite the challenges, the regulation of content generated by GenAI must be considered with utmost seriousness. Content governance standards such as the EUs Digital Services Act (DSA) demonstrate a move in the right direction. Under article 40 of the DSA, vetted researchers can request data from very large online platforms (VLOPs) and search engines (VLOSEs) to research systemic risks in the EU.

Recently, a formal request for information was sent out to 17 platforms, including Amazon, YouTube, Facebook, TikTok and Apple to see how they were complying with the requirement under the EU's new DSA since being launched last year. The DSA includes a provision granting researchers unprecedented access to the data of VLOPs and VLOSEs to enable a deeper understanding of the impact of online media on society; and support the effective oversight of DSA compliance.



From Core to Edge: A Holistic Strategy for Seamless Machine Learning Integration

The widespread adoption of IoT sensors is evident across various sectors, including the traditionally conservative field of healthcare. Whether in smart factories, cities, supply chains, connected homes, or automobiles, an extensive sensor network is now in place for these applications, responding promptly to incoming data.



evertheless, the conventional approach of transmitting data to the cloud and then receiving execution

instructions introduces a time delay. Efficiency improvement is essential in the process of transferring intelligence to the cloud and acquiring inputs, ideally achieving this within a single-

digit millisecond timeframe. To address this challenge and minimize latency, real-time data computing has shifted towards edge computing.

Edge computing involves capturing, storing, processing, and analyzing data in close proximity to where it is required; enhancing response times, ensuring low latency, and conserving bandwidth. This decentralized computing framework brings applications nearer

to data sources like sensors and IoT devices.

Edge computing entails the relocation of cloud services from the network's core to its peripheries, enabling nimble service responses and streamlining network traffic load. However, despite the accelerated response times provided by edge computing, the proliferation of mobile and IoT devices results in vast amounts of multi-modal

data that networks struggle to manage. This surge in devices can lead to cloud congestion and expose security vulnerabilities.

The Significance of Cloud-Based Machine Learning for Edge Devices

There is a growing imperative to shorten the duration from data ingestion to action, aligning with the latency requirements of process automation. Businesses need to explore methods for more efficient management, processing, and utilization of edge data. This entails finding strategies to prevent data packets from following convoluted routes that diminish their value within the network.

The remedy to this challenge involves shifting decision intelligence to the edge through the application of machine learning (ML). By adopting this approach, enterprises can effectively harness edge data to make informed, real-time decisions, ultimately positively impacting their financial performance.

Integrating Edge Devices with Cloud-Based Machine Learning

Many machine learning models exhibit a high demand for processing power, necessitating substantial parallel operations. Consequently, there is a reliance on cloud computing, forcing machine learning to operate primarily in centralized data centers. Unfortunately, this approach often compromises security, incurs significant costs, and, most crucially, introduces latency issues.

In today's business landscape, every interaction between enterprises and their customers involves a combination of various touchpoints and hybrid technologies that require swift access to devices, data, and applications. Achieving such speed is essential for creating impactful new experiences and delivering positive end-user interactions.

However, the conventional practice of transporting datasets to remote clouds through networks hinders the attainment of these goals. By employing machine learning in conjunction with edge computing, enterprises can swiftly gather insights, recognize patterns, and

initiate responses more expeditiously. By leveraging this integrated approach, businesses can overcome the limitations of conventional data transportation, enabling more agile and efficient operations in the rapidly evolving landscape of modern computing.

How Does Edge Machine Learning Operate?

Edge machine learning involves deploying machine learning models directly to edge devices, where they can be activated by edge applications. This approach has gained significant importance in today's context, as highlighted previously.

In numerous scenarios, raw data is gathered from sources situated far from the cloud and is often subject to specific restrictions or requirements. These constraints may include issues such as poor connectivity to the cloud, the need for real-time predictions, legal limitations, and regulatory compliance. Such limitations can hinder the transmission of data to external services or large datasets that necessitate pre-processing before sending responses to the cloud.

Various applications, including preventive maintenance, defect detection in production lines, and driving safety and security functions, can benefit from employing machine learning at the edge. By bringing machine learning capabilities closer to the data source, these applications can realize improved efficiency, realtime decision-making, and heightened responsiveness, thereby revolutionizing the landscape of industrial processes and safety measures.

A solution at the edge that integrates machine learning consists of both an edge application and a machine learning model embedded within this application. Edge machine learning manages the lifecycle of one or more ML models deployed to the edge devices.

The machine learning model can originate from the cloud and conclude with a standalone deployment on the edge device. Different scenarios

call for distinct ML model lifecycles, encompassing stages such as data collection and preparation, model building, compilation, deployment on the edge device, and more.

It's crucial to emphasize that the machine learning at the edge function is distinct from the application lifecycle. Decoupling the machine learning model lifecycle from the application lifecycle grants independence and flexibility, enabling them to evolve at different paces as necessary.

Strategizing Edge Machine Learning

Implementing an edge machine learning strategy in tandem with cloud support enables modern organizations to deliver consistent application and operational experiences. This approach facilitates expansion into remote locations facing challenges in maintaining continuous connectivity with the data center. To achieve this, it is crucial to establish consistent deployment models extending seamlessly from the core to the edge.

Architectural flexibility is essential to address diverse connectivity and data management requirements. Identifying and addressing automation needs for streamlining infrastructure deployments and updates, spanning from core data centers to edge sites, is paramount. Additionally, addressing the unique data security challenges of the edge environment is imperative.

Using this strategy, the development and operationalization of machine learning models are executed using DevOps and GitOps principles. Edge machine learning effectively tackles latency challenges, distributes computing load, and produces superior real-time, real-world outcomes.

Leveraging machine learning at the edge not only enhances performance but also makes the exploration of new opportunities more accessible. This strategic integration enables not just an improvement in operational efficiency but also facilitates organizations in readily identifying and capitalizing on novel prospects that arise within the dynamic landscape of technology and data-driven advancements.



Fostering Diversity and Inclusion in the Digital Era

Realizing the potential of diversity and inclusion is the key to achieving success in the modern world. Imagine a workplace or community where unique characteristics are not just acknowledged but celebrated; where inclusion is not just a buzzword but a dynamic force driving productivity and innovation. This will create a ripple effect that extends from individual growth to organizational excellence and community harmony.

his synergy of diversity and inclusion goes beyond mere rhetoric— it transforms workplaces into hubs of creativity, unleashing the true potential of every team member. As we

dive into the realm of equality, diversity, and inclusion, it's important to consider the paradigm shift that propels us towards a future where differences are not only embraced but become the driving force behind improved decision-making, expanded market reach, and a profound sense of belonging. The industry is set to embark on a journey

where diversity isn't just a checkbox, but a catalyst for positive change.

Digital Literacy Programs

In the realm of advancing digital literacy, a commitment emerges to bridge the gap across diverse communities. Emphasizing tailored programs addressing the unique needs of various demographics, the focus remains steadfast on ensuring everyone's active participation in the digital age. A world is envisioned where inclusivity and innovation converge, enabling individuals to navigate the digital landscape with confidence and skill.

Digital literacy is recognized as a fundamental competency for future education. Here are some of the pivotal initiatives (completed and in progress) within the ICT industry when it comes to digital literacy:

 Introduced in 2018 as a part of the company's Goodwill Journey, Ooredoo's Digital Tutorial App is Oman's first comprehensive education app. Offered free of charge, it features diverse digital courses through visual and audio lessons, with approximately 14,000 daily users and an average view time of 21 minutes per student.

On the other hand, Ooredoo Qatar introduced the Ooredoo Learning Academy (poised to be the Group's learning arm) to address current skill gaps and future business needs as well as foster continuous learning and performance excellence.

 Since 2008, Huawei has been actively contributing to talent development through various programs. To date, the Seeds for the Future program has nurtured over 2.2 million digital talents across 150 countries. The ICT Academy, capable of training 200,000 students yearly, further contributes to this endeavor.

The company has committed to a total investment of USD 300 million by 2026 to advance digital talent development. In October 2023, the UNESCO-Huawei TeOSS project initiated digital education platforms as a pilot, providing digital skills training for both teachers and students. The project also focused on crafting policy frameworks and evaluating its effectiveness in African nations.

 Introduced in January 2020 by Vodafone Business Ventures, Connected Education offers global

- access to connectivity, devices, and classroom collaboration software for students and teachers. In South Africa, Vodacom e-School enables learners to access curriculumaligned content and allows educators to access learning materials on their smartphones without data charges.
- In March 2023, e& launched the 'I Speak Code&' bootcamp- an eightweek coding program in collaboration with Code.org and supported by Abu Dhabi Global Market (ADGM) Academy. This initiative, the UAE's first of its kind, continues to focus on elevating computer science education for children aged 5 to 12. Furthermore, e& partnered with Code. org to advance computer science and software education in the Middle East, Asia, and Africa. This initiative not only enhanced the integration of technology into educational curricula but also opened avenues for collaborative investments in future technologies.
- In 2022, Fortinet facilitated the reskilling (or skill expansion) of over 219,000 individuals for careers in cybersecurity. This was achieved through initiatives sponsored by the Fortinet Training Institute, which targets the industry's talent shortage.
- In January 2024, Zain KSA partnered with Kebar Association to address the digital divide and empower the elderly in adapting to a technologydriven society. The MoU aligns with Zain KSA's sustainability strategy, focusing on enhancing digital skills and fostering inclusion in line with Saudi Vision 2030. The initiative involves providing user-friendly training courses tailored for seniors, helping them gain proficiency in essential digital applications and programs to improve their quality of life

Bridging the Gender Gap

Empowering women in technology and promoting gender diversity are crucial steps toward building a more inclusive and innovative future. These are some of the successful initiatives within the dynamic ICT industry:

 Fortinet's commitment to gender diversity saw a 39% increase in women hired in 2022. The

- company has strengthened its DEI organizational governance through the establishment of the DEI Organizing Committee and Council.
- In 2019, du pioneered the first Women's Council in the UAE's telco industry. Notably, du achieved a groundbreaking 20% representation of women at the board level, marking a GCC milestone. Aligned with the UAE's agenda and global best practices, du's Gender Balance Council actively empowers women, fostering equality and inclusion within the organization.
- In June 2023, e&, in collaboration with Nokia and backed by UN Women, concluded its inaugural 'Women in Leadership' program, reinforcing its dedication to advancing gender diversity, empowering women, and advocating for sustainable business practices. This initiative is a part of the Nokia-UN Women collaboration series.
- AWS has enacted inclusive programs such as We Power Tech and AWS Amplify, providing training, networking, and mentorship to underrepresented groups in technology, with a focus on women. AWS Educate offers free cloud computing resources to educators and students, while AWS re/Start provides free training and job placement support for unemployed or underemployed individuals.
- In 2020, Vodafone introduced #ChangeTheFace, urging tech leaders to pledge for increased diversity and equality. Additionally, the company aims to enhance diversity in its supply chain by joining WEConnect International's global network; fostering connections with more women-owned businesses globally.
- Diversity & Inclusion Program Middle East' at the 17th Telecom Review Leaders' Summit. Pioneering diversity, equity, and inclusion initiatives, Zain KSA focuses on creating an inclusive and empowering environment. Their success is showcased through empowering Saudi women in the ICT sector, including the Women in Technology (WIT) program that extends support to female university students in STEM fields.

- At NEC, 'Inclusion & Diversity' is not just a strategy but a core element of management and business growth. They emphasize that diversity gains value only through demonstrated inclusion, intentionally placing inclusion before diversity.
- PLAYBOOK, a global professional learning network for career-driven women professionals and female founders, propels women into leadership roles through powerful masterclasses, exclusive events, mentorship programs, job boards, and a toolkit of resources.

Employment Opportunities

Fostering diversity, equity, and inclusivity (DEI) within an organization is essential for cultivating unique perspectives and ideas, ultimately leading to innovation, productivity, and resilience. DEI contributes to equal opportunities and fair treatment at all stages of the employment relationship, encompassing recruitment, retention, promotion, remuneration, and access to training and skills development. Citing some examples below, the technology industry is actively addressing the gender gap and prioritizing inclusivity in the workplace.

- Recognized by Telecom Review Group as the 'Best Diversity & Inclusion Program – Africa,' Bayobab credits its success to a diverse team of 324 employees from 36 nationalities. This diversity fosters innovation, enriches solutions, and propels rapid growth. Bayobab prioritizes gender equality, with 41% of its workforce being female, and 15% holding senior leadership roles.
- The Inclusion & Diversity Group at NEC collaborates with relevant departments to implement various initiatives. These include supporting and promoting women's career advancement, advocating for the inclusion of people with disabilities and sexual minorities (LGBTQ), and facilitating the onboarding of non-Japanese employees and mid-career hires.
- du remains committed to prioritizing Emiratization (employment of UAE citizens), creating opportunities and recognizing the contributions of UAE nationals. Currently, Emirati

- employees comprise 40.9% of the total workforce at du, with 50% in leadership positions.
- Recognized by Telecom Review Group as the 'Best Diversity & Inclusion Program - Global,' Nokia is dedicated to reshaping the technology landscape with transformative initiatives promoting gender equality, diversity, and inclusion. In 2023, a minimum of 27% of Nokia's global external recruits were female. The company also introduced its ESG mandatory in 13 languages in 2022, completed by over 97% of employees, and the Global New Child Leave Policy is now a minimum standard across all Nokia countries' leave policies.
- In 2022, e& achieved a historic gender diversity rate of 25%, reflecting a highly-productive workforce that embraces increased representation of women, People of Determination (PoD), youth, diverse nationalities, and neurodiverse talent. Moreover, 79% of the 188 Al graduates hired in 2021 and 2022 were female, showcasing a commitment to nurturing young Emirati female talent.
- In October 2023, AWS introduced two innovative programs: Qudwatech, supporting young Emirati women in STEM careers, and a second program, kickstarting in 2024, for mid-to senior level women in technology. This initiative originated from a Memorandum of Understanding (MoU) with the Dubai Business Women Council (DBWC).
- One of Zain KSA's key initiatives is the WE program, which empowers the workforce by increasing the representation of women in leadership roles and fostering gender diversity throughout the workplace. Njoud Alshehri, Digital Executive General Manager at Zain KSA, was also recognized and presented with the 'Global Merit Leader Women in ICT of the Year' award by Telecom Review Group due to her exceptional leadership and innovation.
- As for PMP Strategy, the company claims that its strength lies in the diversity of its members. Hence, the company regularly organizes meetings to encourage openness and culture across its teams. The

- different sectors also organize outings to provide insights into their respective subjects and offer a range of enjoyable activities that mirror the warm atmosphere of the company.
- Led by employees, SES established three Equality and Inclusion
 Working Groups— Gender, Ethnicity, and General— with a mission to dismantle barriers and bias. In five years, they also aim to increase the gender diversity of people managers and executives in the business.
- Sofrecom's diversity and inclusion policy aims to attract talent from various backgrounds and experiences. Through various projects, they promote social development, facilitating women's access to technical jobs. As part of the company's Backbone project in Sub-Saharan Africa, 31% of the workforce is composed of women, and in North Africa, 47% of engineers are women.
- · At Vodafone, the company has completed 95% Omanization and strives to build Oman's happiest workplace, embracing an inclusive culture that promotes well-being and career development. In 2022, as a Group, Vodafone achieved a noteworthy milestone with 40% women participation in its overall workforce, accompanied by a global increase to 32% at the senior management level. The company's ambitious objective is to have 40% women representation in management roles by 2030, aiming to be recognized as the leading employer for women by 2025.

Overcoming Barriers

In conclusion, achieving a truly diverse and inclusive workplace culture requires collaboration from all stakeholders, including hiring teams, DEI teams, leadership, and employees. Success is seen in a workforce that encompasses various backgrounds and identities.

66% of public sector workers and 30% in leadership roles, there is an ongoing imperative for advancements in the private sector throughout the Middle East. This is essential to foster a more equitable environment and provide opportunities for female talent.





Building on previous years' successes, we continue our mission of connecting THE INDUSTRY'S LEADERS

For more information on sponsorships and participation, contact:

Issam Eid | issam@tracemedia.info
Mohammed Ershad | ershad@tracemedia.info



Why Telcos Need to Focus on Autonomous Mobility

The automotive industry is transforming fast. As per market analysts, conventional internal combustion engine (ICE) vehicles are expected to peak in the next few years and begin to gradually decline, giving way to electric vehicles (EVs). Many countries have already set up dedicated national automotive industry transformation funds to support the electrification of vehicles and their supply chains in an effort to align with the global green agenda. Despite the current variables in resource pricing and supply chain bottlenecks, subsequently, the new breed of software-rich EVs will lead to an autonomous driving ecosystem.

oreover, companies like AMD, which are at the forefront of technological innovation, are already marketing new Al-powered devices to serve key automotive focus segments including infotainment, advanced driver safety and autonomous driving etc. Additionally, advances in consumer electronics are transforming invehicle experiences (IVX) that were

unimaginable a couple of years ago. Entertainment, connectivity, workplace on wheels and safety are becoming important factors that influence consumer decisions.

According to ABI Research, the number of highly automated vehicles being shipped each year is set to grow at a CAGR of 41% between 2024 and 2030. Future automakers will leverage autonomous vehicle applications to shape brand identities. These applications rely heavily on artificial

intelligence which requires computing platforms that deliver powerful and efficient AI computing. According to Precedence Research, the global autonomous vehicle market size was estimated at USD 121.78 billion in 2022 and is projected to hit around USD 2,353.93 billion by 2032.

Advent of 5G Advanced

A significant signal of the impending adoption of autonomous vehicles in the future is the recent decision at the World Radiocommunication Conference 2023 (WRC-23) where the 6 GHz frequency band was officially designated as the global International Mobile Telecommunications (IMT) during a meeting held in Dubai.

The 6 GHz provides adequate spectrum to tap into the full potential of 5G leading to 5.5G or 5G Advanced connectivity for the widespread application of IoT devices by reaching speeds of 10 gigabits per second. This enhanced speed will allow the telecommunications network to accommodate thousands of small transmitters and receivers scattered across the digital infrastructure that is crucial for autonomous operations.

In a world where everything is connected to everything, 5G Advanced will provide reliable ubiquitous connectivity. In the UAE, the Telecommunications and Digital Government Regulatory Authority (TDRA) successfully conducted Phase II of the 5G Advanced trials project in cooperation with telecom service providers du and e&. The TDRA's initiative is centered on harnessing the maximum speed of 5G within the 6 GHz frequency range, utilizing a 400 MHz bandwidth. Additionally, it aims to assess the potential of this band in enhancing the overall user experience across the entire country.

Furthermore, the proliferation of smart homes and smart living complements the potential of extended connectivity offered by autonomous vehicles. As a natural progression, individuals residing in these smart homes would naturally desire comparable features in their vehicles as well. As a reflection of this growing trend, the global smart and autonomous vehicle market is projected to grow exponentially, reaching an estimated value of USD 448.6 billion by 2035. These technologies are at the forefront of advancing urban mobility globally, revolutionizing transportation and how cities are designed and planned. Innovative automotive devices, equipped with AI engine architecture are capable of accelerating high-performing Al compute applications, while providing safety and security features and advanced automotive designs. Such devices are expected to be available by early 2024.

Autonomous Mobility Operation Challenges

For smooth autonomous operations, along with adequate physical infrastructure, in-built Advanced Driver Assistance Systems (ADAS) in vehicles are crucial. ADAS has the potential to avoid accidents and manage traffic better by eliminating human error and providing real-time data about traffic conditions. The technologies incorporated in the ADAS include automatic emergency braking, adaptive cruise control, lane-keeping assist, selfpark, and varying automatic emergency braking systems. However, ADAS are still in their developmental stage, and a handful of highly broadcasted—and sometimes fatal - crashes have raised concerns about the safety of the technology.

In the UAE, as an ongoing endeavor to transform Dubai into the smartest city worldwide, Dubai's Self-Driving Transport Strategy aims to convert 25% of total trips in Dubai into selfdriving transport trips across different modes of transport by 2030. RTA has plans to introduce 4,000 autonomous vehicles for taxi services by 2030. Furthermore, ITC Abu Dhabi is also developing its Autonomous Vehicle regulatory framework and a road map that incorporates all types of AVs into Abu Dhabi's transport system. These initiatives may take a while to be fully functional but the momentum of the progress in fine-tuning these technologies is heartening.

Growing Opportunities for Telcos

In mid-2023, the UAE Cabinet approved the first preliminary national license for self-driving cars, granting it to Chinese company, WeRide, as part of efforts to transform the country's transport sector and move towards a future economy. Dubai is one of the most advanced smart transport technologies adopters. With the expanding infrastructure and advancements in Al and IoT, the demand for automobiles is poised to shift towards the adoption of ADAS technology.

Moreover, to lead smart and autonomous vehicle applications in the UAE and beyond, Abu Dhabi will host DRIFTx— an international thought-

leadership and exhibition platform dedicated to advancing the future of smart and autonomous mobility across air, land, and sea. The discussions and collaborations during the event are expected to be instrumental in fostering a sustainable, innovative future, whilst also setting new benchmarks in the autonomous vehicle and mobility sector.

As the primary connectivity providers for all facets of digital transformation, telecommunications companies (telcos) are strategically positioned to concentrate their business development efforts on diverse opportunities within sustainable autonomous mobility. This encompasses domains such as air, land, and sea, involving intelligent transportation systems, safety technologies, and customer experience solutions. The telecom sector's stakeholders must utilize their expertise to provide a solid footing for the autonomous mobility sector to accelerate their journey towards digitally-advanced operations in the UAE (and greater Middle East region).



The telecom sector's stakeholders must utilize their expertise to provide a solid footing for the autonomous mobility sector to accelerate their journey towards digitally-advanced operations in the UAE (and greater Middle East region)



MARCH 2024 OPERATORS' NEWS 38

e&, Leading Telecom Giants Form Global Telco Al Alliance at MWC24



SK Telecom, Deutsche Telekom, e& Group, Singtel and SoftBank Corp. held the inaugural meeting of the Global Telco AI Alliance (GTAA) at MWC Barcelona 2024 and announced their plans to establish a joint venture.

The meeting was attended by SK Telecom's Chairman, Chey Tae-won; SK Telecom's CEO, Ryu Young-sang; Deutsche Telekom's CEO, Timotheus Höttges and Deutsche Telekom's Board Member for Technology & Innovation, Claudia Nemat; e& Group's Group CEO Hatem Dowidar;

Singtel Group's CEO, Yuen Kuan Moon; and SoftBank's CISO, Tadashi Iida.

Through the joint venture company, the five companies plan to develop large language models (LLMs) specifically tailored to the needs of telecommunications companies. The LLMs will be designed to help telcos improve their customer interactions via digital assistants and chatbots.

The goal is to develop multilingual LLMs optimized for languages including Korean, English, German, Arabic and Japanese, with plans for additional languages to be confirmed among the founding members.

The joint venture plans to focus on deploying innovative AI applications tailored to the needs of the Global AI Telco Alliance members in their respective markets, enabling them to reach a global customer base of

approximately 1.3 billion across 50 countries. Deutsche Telekom boasts about 250 million subscribers across 12 countries, including Germany and the U.S. e& Group has 169 million subscribers in 16 countries across the Middle East, Asia, and Africa, while the Singtel Group boasts 770 million subscribers in 21 countries, including Australia, India, and Indonesia.

The joint venture company will be established within this year.

Compared to general LLMs, telcospecific LLMs are more attuned to the telecommunications domain and are better at understanding user intent. By making it easier for telcos to deploy high-quality Generative AI models swiftly and efficiently, telco-specific LLMs are expected to help accelerate AI transformation of various telco business and services, including customer service.

Salam Completes Sale of Fiber Assets to TLS, Acquires 60% Stake in Company



Integrated Telecom Company (Salam) - licensed to provide fixed telecommunications services with infrastructure— has finalized the sale of its entire fiber optic network to Technical Links Services Company Limited (TLS). TLS, a wholesale infrastructure service provider licensed by the Communications, Space, & Technology Commission (CST), was established by Al-Mawarid Investment Limited as a limited liability company (LLC) in 2020. Previously, Salam received CST approval on a three-phase implementation plan to transfer all of Salam's fiber-optic network assets to TLS.

This announcement follows CST's approval of Salam's request to sell all its fiber optic infrastructure assets to TLS, along with the approval of Salam's request to acquire a 60% ownership stake in TLS.

A Robust Fiber Optic Infrastructure

TLS will own the fiber optic infrastructure assets and will function as a wholesale service provider, enabling other service providers and researchers to leverage the company's fiber optic network infrastructure within the Kingdom. As a wholesale service provider, TLS will operate as a central hub, facilitating access to its extensive fiber optic network infrastructure for various stakeholders, including service providers and researchers.

Through intricate coordination and management, TLS will establish

agreements with these entities, granting them access to its network resources. This access enables service providers to expand their offerings without the need for extensive infrastructure investments, thus fostering innovation and competition in the market.

Moreover, researchers will benefit from accessing high-quality data transmission capabilities provided by TLS's infrastructure. This access opens avenues for in-depth analysis, experimentation, and the development of new technologies and applications reliant on robust network connectivity.

Following the completion of the sale, TLS will become one of the largest providers of telecommunications services for the Kingdom's fiberoptic infrastructure.

MARCH 2024 OPERATORS' NEWS 39

EITC (du) Q4 Net Profit Soars 36.8% to AED 1.67 Billion



Emirates Integrated Telecommunications Company PJSC published its financial results for Q4 and the full-year 2023. Full-year revenues grew by 6.9% to AED 13.64 billion, highlighting sustained demand for mobile services, and strong growth in postpaid and fixed services. Fullyear EBITDA surged by 12.8% to AED 5.80 billion, reflecting top line growth combined with margin expansion and disciplined cost management. Full-year net profit reached AED 1.67 billion- a 36.8% increase year-overyear, mainly underlining strong EBITDA growth. Full-year CapEx was stable at AED 2.2 billion and operating free cash flow (EBITDA - CapEx) for the year substantially rose by 23.2% to AED 3.6 billion.

Based on these positive outcomes, the Board recommends increasing the full-year dividend to 34 fils per share, out of which 13 fils per share were already paid in August 2023 as an interim dividend.

2023 Operating Highlights

du's mobile customer base grew 8.3% YoY to 8.6 million subscribers. The company's strong net-additions in the last quarter (456,000) were mainly driven by a significant increase in prepaid customers benefitting from seasonality and promotional campaigns. The postpaid customer base also witnessed a robust 10.5% growth YoY, reaching 1.6 million (Q4 2023 net additions: 63,000), driven by data centric plans and attractive offers.

du's fixed customer base rose by 12.6% YoY, ending the year with 604,000 subscribers— with full-year 2023 net-additions of 68,000 as a result of ongoing commercial efforts in various product categories and the successful implementation of a broadband strategy.

Financial Summary

Commenting on the results, Malek Sultan Al Malek, Chairman of Emirates Integrated Telecommunications Company PJSC, said, "In 2023, Emirates Integrated Telecommunications Company stayed committed to its objective of driving positive changes in the digital and technological arena within the UAE. Additionally, we provided extensive support for government initiatives and policies aimed at accelerating economic and social development, empowering business communities, and enhancing the quality of life for the residents of the UAE. The robust macroeconomic environment and our strong commercial momentum has enabled us to achieve significant milestones and excellent financial results."

Meanwhile, Fahad Al Hassawi, CEO of du, said, "2023 has been a transformational year for du. Our relentless determination and focus have enabled us to deliver on our current strategy while laying out a solid foundation for future growth in both our core business and beyond.

Telecom Egypt and 4iG Partner to Construct Albania-Egypt Subsea Cable



4iG Plc info-communications company and Telecom Egypt - Egypt's first integrated telecom operator and one of the largest subsea cable operators in the region-have reached an agreement on the terms of cooperation for the construction of an express subsea cable between Albania and Egypt. Following the signing of a Memorandum of Understanding (MoU) last October, the terms of this cooperation agreement establish a joint venture between the two companies for the intercontinental subsea cable project. The express subsea cable will create a highcapacity, intercontinental connection linking Africa and Asia (through the Red Sea) to Europe, via Egypt, the Mediterranean, and Albania.

4iG Plc Chairman, Gellért Jászai, and Telecom Egypt Managing Director and CEO, Mohamed Nasr Eldin, signed the agreement in Budapest, Hungary, in the presence of H.E. Márton Nagy, Minister of National Economy of Hungary, and H.E. Dr. Amr Talaat, Minister of Communications and Information Technology of Egypt, as well as top officials from both companies.

Adding Diversity, Managing Data Traffic and Granting Access

Noted as the first cable to link the two countries, the planned subsea cable's Mediterranean route will be unique, adding another layer of diversity to the conventional Mediterranean routes linking Egypt to Italy and France. This route diversification adds resilience to the existing Mediterranean routes connecting Egypt to Italy and France, enhancing connectivity options and reducing the risk of disruptions.

It will capture a significant share of the huge and rapidly growing data traffic market between Asia. East Africa. and Europe. As data traffic continues to grow rapidly in these regions, particularly with the increasing adoption of digital technologies and online services, having direct connectivity through the Albania-Egypt cable offers efficiency and speed in data transmission. This is crucial for businesses, governments, and individuals alike who rely on seamless and reliable internet connectivity for communication. commerce, and various other activities.

MARCH 2024 OPERATORS' NEWS 40

Ooredoo Group's Solid FY23 Performance: Record High Net Profit of QAR 3 Billion



Ooredoo announced its financial results for full-year 2023 (FY23). Commenting on the results, HE Sheikh Faisal Bin Thani Al Thani, Chairman of Ooredoo, said: "Ooredoo strives to enhance people's digital lives and deliver value to its stakeholders. In 2023, we continued to provide bestin-class connectivity and deliver superior customer experience by investing in our capabilities and infrastructure."

It has been noted that Ooredoo's 2023 growth was driven by solid

performances in Iraq, Kuwait, Algeria, and the Maldives.

Notably, Ooredoo Group, Zain Group and TASC Towers Holding jointly announced the creation of the largest tower company in the MENA region, which crystallized the value of Ooredoo's tower assets.

In terms of data centers, Ooredoo made progress on the carve-out of its data centers to integrate into a new carrier neutral platform. Qatar and Tunisia have been carved out while Kuwait, Oman, and Iraq are expected to be completed in the first half of 2024.

"Our success is facilitated by our ongoing digital transformation, which not only contributes to our resilience but also empowers us to capitalize on market opportunities and position ourselves for long-term sustainable

growth. Our adaptability in navigating a dynamic market landscape ensures sustained success and attractive returns," continued HE Sheikh Faisal.

Notably, Ooredoo Qatar increased its customer base by 2% YoY (excluding the FIFA 2022 connections) to 3 million despite a challenging operating environment (namely, softer economic activity and increased competition in the mobile segment). According to the CTIO, the company has a good fiber network as a base and they have achieved 98% 5G coverage using the latest technologies.

"As we look ahead, we will continue to drive operational efficiency for profitability and cash generation, while advancing our strategic priorities as we evolve toward becoming the leading digital infrastructure provider in the region," concluded Fakhroo.

Serving the Digital Economy: Omantel Launches National Cloud



Omantel— the leading provider of integrated telecommunication services in the Sultanate of Oman—has reiterated its leadership in cloud computing by building the National Cloud, aiming to facilitate Oman's digital revolution with secure and local data hosting, coupled with cuttingedge cloud services and hyperscaler capabilities.

In a strategic collaboration with Huawei, Omantel is poised to construct the National Cloud, marking a significant stride for the company within the cloud computing domain. With access to cutting-edge technology, global expertise, robust data security measures, and localized data hosting capabilities, Omantel will be able

to extend hosting benefits to the entire Sultanate. This encompasses government bodies, state-owned enterprises, financial institutions, energy corporations, and SMEs alike. Such provision of essential infrastructure accelerates the pace of digital transformation, thereby bolstering Oman's ambitions in fostering a thriving digital economy.

Commenting on the partnership, Omantel CEO Talal Said Al Mamari said, "We are proud of our strategic partnership with Huawei to launch the National Cloud, which aligns with the requirements of the digital revolution. This project is in line with the strategic objectives of Oman Vision 2040 and is consistent with Oman's direction towards the digital economy."

The National Cloud is positioned to revolutionize the landscape by offering customized solutions catering to diverse needs across various sectors, including but not limited to smart cities, smart banking, smart campus, government

data solutions, backup and disaster recovery, medical imaging, smart education, and digital human solutions.

Additionally, Omantel CCO Eng. Aladdin Bait Fadhil stated, "We, at Omantel, continue to strengthen and enhance Omantel's comprehensive ecosystem with the latest cloud technologies. We are confident that the National Cloud will open new doors for our enterprise customers to delve into the future, while benefiting from its quality and security."

Omantel is at the forefront of integrating state-of-the-art technology into the cloud project, guaranteeing data residency within Oman while adhering to the most stringent industry standards for robust data security. In addition to expediting the National Digital Transformation program, the Oman Cloud Services Project is poised to make a significant contribution to the digital economy, empowering various public and private sector entities to align with the objectives outlined in Oman Vision 2040.



The Maturity of Satellite Tech

Satellites, the high-tech sentinels orbiting from above, embody the sophisticated infrastructure required for a thriving modern society, facilitating seamless communication, enabling scientific exploration, and contributing indispensably to the intricate web of technological progress.

n the context of the development of contemporary massproduction industries, the maturity phase is characterized by the emergence of new economic sectors driven by the direct utilization of products and the introduction of product-enabled services. Within the satellite industry. the maturation process is evident as both the satellite manufacturing and launch segments, and the ground equipment and satellite services segments contribute significantly to shaping the industry's evolution.

Engaging in the global satellite industry takes significant initial investments from a country, mandating unique infrastructures and capabilities. Moving forward, once the satellite space industry reaches a full maturity life cycle phase, entry barriers will become even more prominent.

It is predicted that the six-leading space-faring governments (US, China, Russia, Japan, India, and Europe) will account for two-thirds of the total satellite manufacturing and launch demand in value.

Serving as technological catalysts, satellites not only enhance connectivity but also contribute critical data for informed decision-making, precision agriculture, disaster management, and scientific research, showcasing their transformative impact on a global scale.

Satellite Applications in Various Sectors

A. Communication

Deloitte predicts that more than 200 million smartphones with satellite connectivity will be sold in 2024. These phones are expected to contain about USD 2 billion of special chips.

One of the latest efforts in enabling direct-to-device (D2D) capabilities is shown by T-Mobile and SpaceX. Using Starlink's LEO satellite constellation, they have successfully provided text messaging services for customers in the United States,

aiming to provide full global texting coverage by the end of 2024.

The satellite communication landscape is poised for a transformative decade of growth as satellite capacity demand is projected to surge from 3.6 Tbps in 2022 to 51 Tbps in 2032, representing a 31% CAGR. All data segments are expected to observe exponential growth in the next 10 years.

Expected to achieve an approximate capacity of nearly 200 Tbps by 2028, this growth aligns with the emergence of novel non-geostationary orbit (NGSO) constellations, particularly in the low Earth orbit (LEO). Noteworthy developments include Telesat Lightspeed and Amazon Kuiper, complemented by second-generation constellations for Starlink and OneWeb. Additionally, the landscape is enriched by Very High Throughput Satellite (VHTS) deployments such as Viasat-3, Jupiter-3, and Satria-1.

Additionally, as satellite-based non-terrestrial networks (NTN) gain momentum on the user end, Juniper Research estimates that NTN could yield up to USD 1.7 billion in revenue for telecom operators. Network operators could also generate USD 17 billion of additional revenue from 3GPP-compliant 5G satellite networks between 2024 and 2030.

Anticipated in 2024, the inaugural commercial launch of a 5G satellite network is poised to pave the way for over 110 million operational 3GPP-compliant 5G satellite connections by the year 2030. To capitalize on this growth, the research urges operators to prioritize immediate partnerships with satellite network operators (SNOs) that can launch GSO satellites.

For example, du's cellular backhaul solution stands at the forefront of innovation, significantly enhancing the capabilities of mobile coverage in remote areas. Through its partnership with Intelsat, it can leverage the full capacity of the IS-39 satellite, providing coverage to the most remote areas of the nation.

Moreover, Release 17 will also introduce new radio (NR) support for NTN technology— primarily satellite communications.

B. Earth Observation

Satellites play a crucial role in Earth Observation, supporting environmental applications. climate monitoring, and disaster management for public safety. Recent studies, leveraging artificial intelligence in tandem with satellite technology, have unveiled notable discrepancies in public tracking systems, exposing a considerable portion of the burgeoning USD 2.5 trillion blue economy. Industrial fishing, transport, and energy activities are identified as sectors with substantial 'unaccounted for' elements.

The upcoming MBZ-SAT from MBRSC in Dubai (set to launch in 2024) will enhance mapping accuracy for monitoring environmental changes, water quality, and agricultural development. Similarly, aligned with sustainable development goals, Egypt's successful launch of the Horus 1 satellite, with high-resolution imaging capabilities, contributes to their strategic vision.

In times of major disasters, satellites provide essential global views and precise data only achievable from space. The International Charter in 'Space and Major Disasters' has been activated over 800 times, relying on Earth observation satellites for rapid and high-quality responses, especially during floods and storms.

In the near future, the collaborative endeavor between India and NASA, embodied in the NISAR satellite scheduled for an anticipated launch in early March 2024, marks a pioneering initiative. Noted as the costliest and largest radar imaging satellite to date, NISAR will create detailed 3D maps, offering invaluable data for monitoring natural disasters, resource management, and climate change studies.

C. Navigation

In the realm of satellite navigation,

the term 'global navigation satellite system' (GNSS) defines systems providing worldwide coverage. As of 2023, there are four operational global systems, namely, the United States' Global Positioning System (GPS); Russia's Global Navigation Satellite System (GLONASS); China's BeiDou Navigation Satellite System; and the European Union's Galileo.

The future trajectory of GNSS points toward significant advancements, characterized by heightened accuracy, increased integration, and the deployment of next-generation satellites. Innovations in receiver technology and signal processing techniques aim to elevate positioning accuracy to the centimeter level.

GNSS is poised to synergize with emerging technologies such as augmented reality (AR), autonomous vehicles, and the Internet of Things (IoT), expanding its applications considerably. Anticipated satellite launches promise enhanced capabilities, featuring higher transmit power and improved resistance to interference.

These next-generation satellite navigation systems will transform space communication, offering precise positioning, navigation, and timing services. Through global coverage, superior signal quality, and support for multiple constellations, these systems have revolutionized space exploration, spacecraft navigation, and inter-satellite communication.

D. Scientific Research

Satellites play a pivotal role in advancing space exploration and deepening our comprehension of the universe. International collaboration is key in conducting joint space research initiatives.

Scheduled for launch in February 2024, the Nova-C mission will carry scientific instruments and technology demonstrations to the lunar surface, significantly contributing to lunar exploration and research on resource utilization. A pivotal moment in lunar exploration is on the horizon, as China

aims to launch Chang'e 6 in May 2024; aiming to collect and return the first lunar samples from the far side of the Moon, offering invaluable insights into its geological composition and history. Meanwhile, NASA's Europa Clipper represents the inaugural dedicated mission focused on studying Jupiter's moon Europa. This mission involves an orbiter spacecraft conducting multiple flybys over Europa while in orbit around Jupiter.

Various satellites also enhance our understanding of celestial bodies' origin, formation, structure, and evolution. Additionally, they enable the study of the physics and effects of phenomena like the impact of solar flares on Earth's magnetic field.

Technology Progress

Technological advancements, including 3D printing and digital twins, are optimizing satellite designs. Improvements in processing power, data storage, camera technology, and miniaturization make systems more cost-effective, easier to launch, and easier to troubleshoot.

Yet, proliferated low Earth orbit (LEO) architectures are steering satellite manufacturers towards larger, customizable platforms, moving away from the 16U cubesat model.

Research advocates are also integrating machine learning into CubeSats for enhanced spacecraft navigation, ensuring precise location determination relative to Earth and the moon, improving navigation and landing accuracy.

In pursuit of extended mission lifetimes, the industry is exploring inspace servicing technology to prolong satellite service. Future satellites may feature interfaces or plug-in ports for refueling, power, and data upgrades.

Thrusters are increasingly becoming a standard on satellites, providing operators with a tool for in-flight safety and sustainable de-orbiting at the end of the satellite's life.

A green propulsion system has been in the works, establishing a revolutionary shift that replaces traditional toxic propellants with a non-toxic, high-performance alternative, aligning with global efforts to reduce the environmental impact of space exploration.

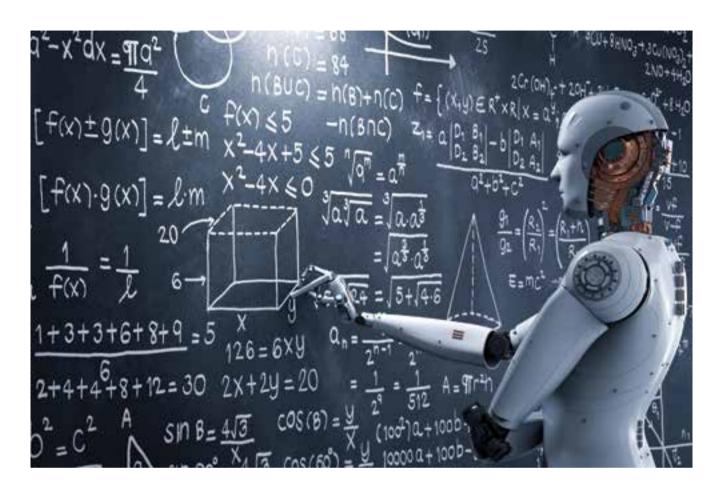
Satellite Industry in 2024

In conclusion, as we embark on the journey into 2024, the satellite sector is primed to perpetuate the strategic frameworks established in 2023. Three overarching global trends are anticipated: the integration of multiple orbits, spanning high, medium-, and low-Earth orbits; the widespread adoption of direct-to-device connectivity; and a shift from reliance on small satellites to a greater emphasis on medium to large-scale satellite investments.

Projections indicate a substantial growth trajectory, with an estimated average of 2,800 satellites slated for launch annually by 2032. Industry observers outline two potential paths: the establishment of satellite communication technology standards, potentially led by entities like 3GPP; and a satellite-centric approach—involving rapid satellite launches to enable satellite-to-cell services for smartphones.

While the standardization process unfolds gradually, its influence on long-term industry trends is pivotal. In contrast, the alternative approach, focused on rapid satellite deployment, offers expediency but hinges on the capabilities of specific satellite operators.

The culmination of this transformation in the satellite industry is exemplified by the evolution of LEO satellites. Transitioning from a historical emphasis on small-scale models, the emergence of larger and more robust medium-sized satellites signifies a shift towards increased dimensions, enhanced performance metrics, and the facilitation of D2D connectivity for mobile devices. This ongoing metamorphosis underscores the dynamic nature of the satellite industry as it forges ahead into the future.



Al in Education: A Journey of Transformation and Regulation

In the realm of technology, the world is witnessing a plethora of innovations that address various industries. From satellites in space to submarine cables in the sea and advanced robots aiding in day-to-day tasks, the process is continually evolving—rapidly transforming communication. One of the significant achievements that has profoundly impacted the technological revolution is artificial intelligence (AI).



continues to emphasize its significance with the solutions it offers. However, what about education?

As education remains one of the most crucial topics globally, all eyes are focused on the impact of AI in this field.

The Rise of AI in Education

Recent studies have highlighted the impending revolution in education, backed by AI chatbots garnering support from influential tech figures. AI is transforming education by offering personalized learning experiences

tailored to individual student needs. This innovative approach liberates educators from routine tasks that can be automated, allowing them to focus on meaningful interactions and critical thinking facilitation.

The concept of automated teaching platforms that customize lessons for each student is not new. Tech initiatives over the years have aimed to bridge achievement gaps through individualized instruction. Despite some positive outcomes, many educational technology efforts fell short of significantly improving academic results.

Al-powered virtual assistants have further enhanced personalized educational experiences. Students now have access to instant answers, feedback, and doubt resolution, effectively serving as personalized tutors.

This integration represents more than just technological advancement; it symbolizes a profound shift in teaching dynamics. This synergy between advanced technology and education creates a more inclusive, dynamic, and effective learning environment.

Controversies Surrounding AI in Education

The emergence of generative AI tools, like ChatGPT, has reignited enthusiasm for automated instruction. Online learning platforms have introduced AI chatbot tutors based on GPT-4, which are capable of providing answers and generating human-like reports.

Nevertheless, the potential influence of AI chatbots on education is not devoid of controversy. Critics question its reliability and potential misinformation, and are concerned about bias, opacity, privacy, and intellectual property. Some AI systems are trained using vast databases, without compensating content creators.

Despite the optimism, education researchers urge caution due to a lack of evidence supporting the transformative effects of tutoring bots. The potential diversion of attention and resources from proven human-centered interventions is a concern, including privacy and labor compensation issues.

Al Chatbots: Improvisation and Engagement

Drawing parallels with the past, the championing of automated teaching tools in the 1960s proved to be overhyped and short-lived. A similar narrative of potential transformation and harm surrounds the current rollout of Al teaching bots.

In contrast to their 20th-century counterparts, AI chatbots are improvisational, generating instant responses in conversational language. Bearing this in mind, some academies are aiming to encourage students to think through problems actively rather than relying on bots to do their schoolwork.

A Call for Consideration and Regulation

The White House's endorsement of Al's potential to transform education has ignited a discourse on the imperative need for careful consideration and regulation. As Al continues to evolve, finding the delicate balance between its benefits and risks becomes paramount in defining the true role of chatbots in shaping the future of education.

Proponents of AI in education envision a landscape where personalized learning experiences and adaptive tutoring redefine how students engage with academic content. However, critics are quick to caution against unchecked enthusiasm, emphasizing the potential pitfalls that may arise without thoughtful consideration and regulatory frameworks.

One primary concern revolves around the reliability and accuracy of AI chatbots, which, if left unregulated, might disseminate misinformation to students. The opacity of these systems and the potential for biases in algorithmic decision-making also raise ethical and equity concerns, prompting a call for regulatory measures to ensure transparency and fairness.

Privacy issues further compound the need for regulation, as AI systems often collect vast amounts of data from students and educators. Safeguarding this sensitive information and establishing clear guidelines for its use will become crucial to protect individuals and uphold ethical standards.

Moreover, the rapid integration of AI in education could inadvertently divert attention and resources away from proven human-centered interventions, potentially hindering, rather than enhancing, the overall educational experience. Striking the right balance between technological innovation and traditional teaching methods requires thoughtful consideration and regulatory measures to ensure a harmonious coexistence.

In conclusion, as we navigate the future of education in the age of AI, striking the right balance between technological innovation and traditional teaching methods is imperative. Thoughtful consideration and the implementation of robust regulatory measures will ensure the harmonious coexistence of AI chatbots, shaping a transformative and inclusive educational experience for generations to come.



Striking the right balance between technological innovation and traditional teaching methods requires thoughtful consideration and regulatory measures to ensure a harmonious coexistence





How the Cloud is Transforming Disaster Recovery Services

The wave of digital transformation across industry verticals has amplified the challenges of data protection and data management to great lengths.

mportantly, for any business to garner loyal customers in the digital environment, data safety and privacy take top priority and investing in cutting-edge data protection solutions, including data recovery becomes all the more crucial. All data needs to be stored and processed in a secure and

compliant manner in alignment with privacy regulations as laid out by data protection bodies such as the General Data Protection Regulation (GDPR) and other relevant national laws.

Data loss or compromised data remains a constant threat to organizations. As storage volumes grow, finding an efficient solution to backup and manage data cannot be overlooked. Interestingly, a recent survey on data protection revealed that IT leaders are experiencing a diminished sense of security and heightened concern regarding their capability to recover and restore mission-critical data. This sentiment persists despite their investments in protection measures against cyber-attacks. As such, a

robust network disaster recovery (DR) plan ensures that all resources and services that rely on the network are backed up and running in the event of unforeseen interruptions.

Many companies across various industries prefer traditional onpremises servers to back up their data due to easy accessibility and security. However, barriers such as high initial investment costs, ongoing maintenance expenses, susceptibility to physical damage, limited storage capacity, among others, are gradually being replaced by cloud backup solutions. Moreover, industry watchers say that the pace of hardware innovation is increasing (especially with GPU technologies), putting pressure on the price-performance ratio and infrastructure efficiency. Digital transformation warrants businesses to become more agile to cope in a dynamic landscape.

Disaster Recovery (DR), as a crucial aspect of business continuity planning, revolves around two pivotal metrics: a) Recovery Time Objective (RTO), which denotes the maximum tolerable downtime for an application; and b) Recovery Point Objective (RPO), indicating the maximum acceptable period during which data loss from an application due to an incident is permissible. The cloud can greatly reduce the costs associated with both RTO and RPO when compared to fulfilling RTO and RPO requirements on-premises.

Some key considerations in cloud computing supporting disaster recovery operations are as follows:

Reliable and Redundant Storage

Companies can safely and easily recover critical information by regularly backing up data to the cloud in case of disruptions. Cloud storage solutions offered by hyperscalers like AWS and Google offer the advantage of having multiple points of presence (PoPs) spread across various geographical locations. This setup ensures robust redundancy and mitigates the risk of data loss caused by localized disasters, as the system can seamlessly redirect to an alternate location.

Easy Scalability

The cloud's virtualized environment facilitates quick scalability of resources. Additional resources can be added and removed depending on the requirement during disaster recovery scenarios.

Disaster Recovery as a Service (DRaaS)

DRaaS provides automated backup, failover and recovery processes, allowing organizations to quickly restore their IT infrastructure and applications in the cloud. Additionally, Cloud-based applications and services enable employees to access critical data and applications remotely.

Automation and Orchestration

Cloud environments support automation and orchestration, enabling organizations to create workflows for disaster recovery planning using artificial intelligence, enabling quick and consistent recovery operations. Cloud environments make it easier to conduct regular disaster recovery testing and simulations through the use of digital twin technology, without impacting production systems.

Cloud-Enabled Data Analysis

Numerous organizations are exercising heightened caution regarding their networks, operating under the assumption that their network may have already been compromised. As a result, they are prioritizing increased visibility over reactive responses, proactively monitoring for potential threats rather than waiting until an attack occurs. Cloud technology will allow advanced analytics to explore very large diverse data sets to find indicators of compromise (IOCs). These data sets can include different types of structured and unstructured data processed in a 'streaming' mode or in batches. For instance, Cisco's Cognitive Security utilizes Al techniques to detect advanced cyber threats through an advanced behavioral analysis of real-time data.

Supporting Edge Computing

Given the vast amount of data today's businesses generate and exchange, edge computing, also called Mobile Edge Computing (MEC) or MultiAccess Edge Computing, has emerged as a practical architecture to support distributed computing near the data source.

Since the data is processed at the source instead of via centralized data centers, edge computing is ideal for mitigating network congestion securely and in a cost-effective manner as it eliminates long-distance data transfers across regions and international boundaries. By keeping data almost at the source, edge computing bypasses a multitude of procedural restrictions.

Nevertheless, edge computing necessitates server hardware to efficiently execute application functionality, whereas cloud software facilitates and manages the virtual infrastructure resources of cloud applications. As Clouds become more distributed in terms of superior performance and throughput, edge cloud and Cloud Radio Access Network (C-RAN) platforms will be instrumental in supporting many opportunities in advanced immersive media technologies. In line with such a trend, Nokia is developing open standards in edge computing and Cloud RAN to ensure a robust network infrastructure ideal for running such operations.

In Conclusion

Data protection budgets are expected to grow by 6.6% in 2024 and data protection spending growth will outpace IT spending growth, as per latest industry surveys. Overall, 92% of organizations expect to spend more on data protection in 2024 to continue to prepare against cyber-attacks as well as the changing production landscape that requires different approaches to data protection. In a recent development, Amazon Web Services (AWS) is reportedly investing JPY 2.6 trillion (USD 15.2 billion) to build cloud computing infrastructure in Japan by 2027. As the trend towards cloud-native ecosystems gains momentum, telcos must focus on the deployment of cloud-based DR systems to effectively meet diverse customer demands and support the increasingly AI-backed economies of the world.



Al's Watchful Eye: Safeguarding Cybersecurity in the Generative Era

In the Middle East and North Africa (MENA) region, the integration of generative AI (GenAI) has the potential to generate an economic value of USD 23.5 billion by the year 2030. Given this prospect, it is crucial to develop a thorough comprehension of the implications associated with incorporating this technology into security frameworks.



Positive Impacts

1. Advanced Threat Detection:

Generative AI, with its adept ability to analyze extensive datasets and discern subtle patterns, plays a pivotal role in the early detection of potential cyber threats. This enables organizations to respond promptly, mitigating the impact of cyberattacks.

2. Automated Incident Response:

Automating routine tasks empowers cybersecurity teams to focus on more complex issues, resulting in faster response times and enhanced system resilience.

3. Adaptive Security Policies:

Generative AI facilitates real-time learning from emerging threats, enabling dynamic adjustments to defense strategies, ensuring cybersecurity measures remain effective.

4. Human Augmentation: By aiding analysts in data interpretation, threat hunting, and decision-making, generative AI enhances the overall efficacy of security teams.

Negative Impacts

1. Adversarial Attacks: Manipulating Al algorithms to deceive systems and induce incorrect decisions poses a significant threat to cybersecurity.

2. Data Poisoning: The introduction

of malicious data can influence the decision-making process of AI, leading to inaccurate predictions and compromised cybersecurity.

- **3. Over-Reliance on Automation:** False positives or misinterpretations by AI systems may result in unnecessary alerts or the overlooking of genuine threats, emphasizing the need for human intervention.
- **4. Ethical Concerns:** Issues such as privacy violations, bias in decision-making, and responsible AI use demand careful attention to ensure the ethical deployment of generative AI in cybersecurity.
- **5. Phishing:** Leveraging publicly-available personal information to create realistic scams magnifies the scale and efficiency of phishing-as-a-service (PhaaS), posing a substantial risk.
- **6. AI-Based Fake Accounts:** The productivity of attack strategies conducted by fake accounts, including fraud, credential stuffing, disinformation, and marketplace manipulation, could witness a significant boost.
- 7. Real-Time Input: Attackers can elevate the sophistication of their strategies (by incorporating knowledge from open generative Al systems, such as ChatGPT) during live attacks, exploiting APIs for nefarious purposes.

LLM Vulnerabilities

In the absence of adequate safeguards, large language models (LLMs) may generate a deluge of vulnerable code. GenAl code generation, characterized by unique and bespoke code for each developer, poses challenges for security. Organizations prioritizing speed over security risk introduce new vulnerabilities as code assistants generate code rapidly, potentially overlooking critical security reviews. The development timeline of the LLM plays a crucial role; if it falls behind, the model may lack awareness of the latest vulnerabilities. This limitation could impede its ability to construct secure code and avoid importing libraries with potential vulnerabilities. Thus, a balanced approach that prioritizes both speed and security is imperative in the generative AI era.

As generative AI models progress in their development throughout 2024,

the proliferation of Security Copilots is anticipated to elevate the effectiveness of security operations, particularly in the realm of Security Operations (SecOps) productivity. This transformation will bring about a notable change in the team's orientation, shifting from a reactive approach to a proactive mindset. The emphasis will be on constructing advanced threat intelligence platforms that make use of Al as early-warning systems.

GenAl Represents a Pivotal Moment in Cybersecurity

According to a survey involving 1,500 IT and security decision-makers worldwide, almost half of the respondents from the Americas, China, Europe, Asia-Pacific, Japan, and the Middle East and Africa regions indicated their preparedness to implement machine learning (ML) and analytics. This deployment aims to ensure the integrity of their backup data before recovery in the event of a cyberattack.

However, the incorporation of GenAl capabilities into security products remains limited; with a preference for machine learning over Al, specifically in the domain of anomaly detection. This scenario underscores the significance of GenAl as a turning point for cybersecurity, presenting both challenges and solutions. Survey respondents exhibited cautious optimism, with low expectations regarding the technology's contribution to long-term cyber resiliency plans.

Interestingly, slightly over half of the respondents believe that generative AI will initially offer organizations an advantage in their defense against cybercriminals, while approximately 20% foresee its potential to assist both attackers and defenders. Recognizing potential negative impacts, there is a consensus that cybercriminals may exploit GenAI in the near term to evade cyber defenses.

Increased Pressure on the CISO Role

The substantial global average cost of USD 4,450,000 per data breach underscores the severity of the situation, with repercussions extending to customer relations, reputation

damage, and business prospects. In response to escalating cyber threats and vulnerabilities, the C-suite is anticipated to play a more active role in cyber risk-related decisions.

Reports indicate that heightened executive accountability and substantial fines for violations will encourage boards to regularly focus on cybersecurity matters. Possible actions include establishing dedicated cybersecurity committees, seeking advice from external advisors, and demanding regular reports from Chief Information Security Officers (CISOs).

This evolving landscape has transformed the role of the CISO from managing tactical risks and compliance enforcement to being an integral part of business strategy decisions, contributing to cybersecurity-enabled competitive advantages. Consequently, CISOs are urged to mandate cybersecurity education and training programs as additional measures to mitigate risks; and incorporate cybersecurity best practices into broader company-wide strategies.



The advent of GenAl
has ushered in a
transformative era for
cybersecurity, presenting
both positive and negative
impacts



Nokia Harnesses 'Virtual Power' in Energy-Efficient Solutions



Nokia has launched the Nokia Virtual Power Plant (VPP) Controller Software—a unique near-real-time software—based end-to-end platform that helps mobile operators monetize the existing backup batteries at base station sites. Nokia claims to have completed several trials and aims to make the solution available later this year. The solution is the latest example of Nokia's energy efficiency solution portfolio.

Stabilizing the Electricity Grid

Nokia's VPP Controller Software contributes to the stability of the electricity grid and creates a new purpose and function for the base station backup batteries which are usually idle as power cuts can be rare. Most countries have a transmission system operator that manages the electricity grid and oversees the power reserve markets. Power reserve markets operate via an auction system that enables third parties to bid to provide power. Through bidding and winning, an operator can use their

backup batteries to run their base stations while maintaining normal operations and providing energy to the market instead of using the grid energy. This turns their battery backup power systems into an investment with a steady financial return. Additionally, the system supports renewable solar energy production. Incorporating reserve power from the electricity grid helps prevent power outages and diminishes the grid's carbon dioxide emissions.

Nokia's VPP Controller Software ensures that it is safe to use batteries in the power reserve marketplace and estimates how much extra backup battery capacity is available based on the power-consumption profiles for each power station. It uses machine learning (ML) algorithms to create smart offerings based on the actual and the predicted power consumption and the related extra backup power capacity. Nokia's solution incorporates the auction bidding process within the power reserve market, streamlining entry for mobile operators and ensuring a seamless and straightforward experience. This includes the Fast Frequency Reserve market, which requires a sub-second reaction time to offload from the grid and monetize the batteries. This low latency is achieved

by using near-real-time processing servers and Nokia's power system.

Zero-Traffic Zero-Energy Radio Solution

Nokia reaffirmed its dedication to extreme energy efficiency through various product enhancements. These include the introduction of the 'extreme deep sleep cell-switch-off' mode, powered by software in Nokia's AirScale Habrok Massive MIMO radio units. This innovative mode reduces energy consumption by up to 97% compared to when a cell is active (without traffic). Additionally, Nokia introduced the 'zero-traffic, zero-energy' solution, which deactivates all radio resources during periods with zero-traffic, further optimizing energy usage.

Tommi Uitto, President of Mobile Networks at Nokia, said, "Nokia's Virtual Power Plant is an incredible innovation that will help our customers monetize the energy stored in their backup batteries while also reducing carbon emissions. We are committed to continuously maximizing the energy efficiency of our technology portfolio. Our energy-efficient hardware, combined with software features such as Extreme Deep Sleep, is the key to reducing the energy consumption, carbon emissions, and related costs of mobile networks."

Rosenberger Unveils Scutum: New Shielding Cabling Solution for Enhanced Reliability, Stability, and Speed



In early 2024, the resurgence of text-to-video technology, represented by Sora, once again ignited the OpenAl fervor, showcasing the rapid pace of artificial intelligence (AI) development. As AI demands higher system arithmetic and network transmission rates, concerns over network security and private data protection intensify.

To bolster the security and reliability of physical-level network cabling systems and ensure highspeed, stable, and private network transmission, Rosenberger leverages its deep technical expertise and customer-centric approach to introduce the Scutum series shielded cabling solution. This solution is designed to deliver safe, dependable, high-speed, and interference-resistant physical cabling connections for enterprise and industrial clients. The Scutum series comprises shielded cables, angled faceplates, shielded keystones, shielded modular patch panels, and shielded patch cords.

Rosenberger's Scutum series shielded products offer the optimal solution for enterprise network construction amidst the Open AI revolution, ensuring high-speed network connectivity while prioritizing physical link security. Moreover, they mitigate interference in industrial network cabling within complex electromagnetic environments, enabling high stability, reliability, and speed in field network transmission. Leveraging its unique technological advantages, Rosenberger actively empowers the emerging market of high-speed network transmission, safeguarding information transmission security, and bolstering innovators and practitioners.

AWS Supports RTA's Cloud Transition



The Road and Transport Authority (RTA) in Dubai signed an agreement with Amazon Web Services (AWS), a subsidiary company of Amazon that specializes in providing cloud computing platforms and application programming interfaces. The main goal of this partnership is to support the RTA's transition to cloud computing and exchange knowledge and best practices in areas such as application programming, artificial intelligence, data solutions, augmented reality (AR), virtual reality (VR), and the Internet of Things (IoT).

The Transition to Cloud Computing

Through this partnership, RTA seeks to

employ the latest digital technologies to support its transition to cloud computing and enhance digital transformation in the services it generally provides to the public in the Emirate of Dubai.

Transitioning to cloud computing offers a multitude of benefits, especially in enhancing digital transformation and improving services provided to the public in Dubai. Firstly, cloud computing provides scalability, allowing the RTA to easily adjust its computing resources based on demand. This flexibility ensures that the RTA can efficiently manage peak periods, such as during rush hours or special events, without the need for extensive infrastructure investment.

Additionally, cloud computing enhances accessibility and collaboration by providing remote access to data and applications from anywhere with an internet connection. This enables the

RTA's employees to work more efficiently and effectively, leading to improved productivity and service delivery.

Furthermore, transitioning to the cloud enhances data security and disaster recovery capabilities. Cloud service providers like AWS offer robust security measures and compliance certifications, ensuring that the RTA's data remains protected from threats and vulnerabilities. Additionally, cloud-based backups and redundancy features provide a reliable and resilient infrastructure, minimizing the risk of data loss or service downtime.

Pioneering an Advanced Digital Future

Mohammed Al-Mudharreb, CEO of the Corporate Technology Support Services Sector, signed the agreement on behalf of RTA, and Wojciech Bajda, Director of the Public Sector in the Middle East and Africa, signed it on behalf of Amazon Web Services (AWS).

Fortinet Combines 5G With AI-Powered Security



Fortinet, the global cybersecurity leader driving the convergence of networking and security, has recently announced the launch of a new compact and ruggedized appliance explicitly built to deliver enhanced secure networking capabilities and 5G connectivity to operational technology (OT) environments.

Backed by the latest, fifth-generation Fortinet Security Processing Unit (SP5), the FortiGate Rugged 70G with 5G Dual Modem provides unparalleled networking performance, cutting-edge FortiGuard AI-Powered Security Services, and high availability through a 5G dual modem to address a variety of use cases in harsh, remote environments, including full-service remote ATMs within the banking industry.

Connecting and Protecting Remote Locations

Networks are expanding to new, remote locations that must support and protect massive amounts of sensitive traffic and data while remaining highly available. In the past, companies would have deployed numerous point products to address individual networking, security, and connectivity needs at these locations. However, this creates a complex, poorly performing infrastructure that's costly to manage and challenging to secure. The solution is a single appliance that meets all networking, security, and connectivity needs in remote OT environments.

Cutting-Edge Networking, Security, and 5G Connectivity for OT

The FortiGate Rugged 70G with 5G Dual Modem brings 5G connectivity to the Fortinet portfolio consisting of rugged next-generation firewalls (NGFWs) for the first time. Because of this, the appliance not only converges enterprise-grade threat protection with high-performing networking capabilities like SD-WAN and zero-trust network access but also

delivers industry-leading wireless WAN functionality to ensure high availability.

Sami Alshwairakh, Senior Director for Saudi Arabia at Fortinet, said, "The launch of our newest FortiGate equipped with a 5G dual modem represents a significant step towards achieving full digital transformation across a variety of verticals, contributing to providing a secure and efficient infrastructure for all companies and institutions. This aligns with the goals of Vision 2030 in the Kingdom to achieve comprehensive digital transformation and enhance cybersecurity in all sectors of the economy."

He continued, "Our newest FortiGate possesses a range of advanced features that will support companies that increasingly require a fast, reliable, and secure networking architecture in remote locations and harsh environments. It will also support them as they seek to enhance their digital security, protect themselves from advanced cyber threats, and improve their operational efficiency."



Unveiling the Cosmic Potential of Quantum Technologies in Space Exploration

Historically, space exploration has mirrored groundbreaking milestones in physics. The current second quantum revolution, characterized by manipulating individual particle properties, sets the stage for unprecedented possibilities. The convergence of quantum, AI, and space technologies marks a new era in exploration. As space becomes an integral part of the global quantum web, the possibilities are immense. The following depicts the current space-oriented quantum technology applications, as well as the value quantum computing brings to the space industry.



and Security:

Quantum communication harnesses the principles of quantum mechanics

to secure space communication. Quantum Key Distribution (QKD) stands out as a pioneering technology in this realm. QKD employs the phenomenon of quantum entanglement, creating a strong correlation between particles regardless of the distance between them. By leveraging this entanglement, secure communication between two parties is achieved, ensuring that encrypted data remains confidential, even if it is intercepted. In the context of

space exploration, QKD offers enhanced security for satellite networks, ground stations, and future crewed missions, making it a vital component in safeguarding sensitive information across vast cosmic distances.

2. Quantum Navigation and Positioning

Traditional navigation systems, like GPS, rely on classical physics and can be susceptible to disruptions

and inaccuracies in space. Quantum sensors introduce a revolutionary approach to navigation by utilizing quantum properties of atoms. Quantum atomic clocks and accelerometers, operating on the principles of superposition and entanglement, provide extreme precision in measuring time and acceleration. These sensors aid spacecrafts in navigating autonomously with unparalleled accuracy, reducing reliance on external signals or beacons. Quantum navigation thus enhances the efficiency and safety of space missions, offering a significant leap forward in precise positioning in the vastness of outer space.

3. Quantum Sensing and Earth Observation

Quantum sensors, exploiting quantum phenomena like superposition and entanglement, play a crucial role in advancing Earth observation capabilities. These sensors detect minute changes in physical properties such as gravity, magnetic fields, and temperature, with unprecedented sensitivity. In space, quantum magnetometers can monitor changes in the Earth's magnetic field, aiding in space weather and solar weather phenomena prediction. On Earth. quantum sensors significantly improve environmental monitoring, providing valuable insights into geological structures, water resources, and natural disasters. Quantum sensing not only contributes to space exploration but also enhances our understanding of, and response to, terrestrial challenges.

The Value of Quantum Computing in the Space Niche:

The significance of this phenomenon lies in its value, which includes:

1. More Efficient Propulsion Systems:

Quantum computing holds the potential to simulate and analyze atomic-level behavior, aiding in the development of more efficient propulsion systems. By exploring materials and components at the quantum level, engineers can identify novel designs and materials that offer enhanced efficiency and durability, revolutionizing spacecraft propulsion systems.

2. Orbital Debris Detection and Tracking:

Quantum navigation technology, integrated with quantum sensors, contributes to the detection and tracking of space debris. Quantumenhanced space situational awareness enables better tracking of orbital debris, forecasting collision risks, and devising effective mitigation strategies—safeguarding satellites and space infrastructure.

3. Improved Communications Technologies:

Quantum computing's advantage in optimization can be leveraged for network traffic management and the design of reliable and resilient optical communication systems. In the realm of space exploration, this results in an improved transfer of extensive data volumes from space probes to Earth. This advancement enhances our capacity to scrutinize the universe with greater precision, facilitated by improved data transmission capabilities.

4. New Materials and Manufacturing Techniques:

Quantum computing and space technology co-evolve in the development of innovative materials and manufacturing techniques. This includes the creation of spacecraft that are lighter, stronger, and more heat-resistant, pushing the boundaries of what is achievable in space exploration.

5. Climate Action and Net Zero Goals:

Through the integration of quantum computing with Earth observation data obtained from quantum sensors, quantum computing can play a role in advancing climate adaptation models. By constructing digital twin models through a combination of hybrid supercomputing and quantum computing modules, quantum algorithms become instrumental in climate actions. These algorithms offer valuable insights into climate change, aiding initiatives aimed at achieving net-zero goals.

6. New Discoveries and Insights:

Quantum sensors and detectors, coupled with quantum computing simulations, offer the ability to analyze celestial bodies in unprecedented detail. This combination facilitates a better understanding of planets, asteroids, and other celestial phenomena, potentially leading to groundbreaking discoveries about the universe's origins and behavior.

Quantum Readiness and Ethical Considerations

Acknowledging the early stages of quantum computing, the need for strategic planning and preparation to be 'quantum ready' has been emphasized. Globally, there is a collective appeal for responsible innovation, ethical guidelines, and collective efforts to ensure quantum-enabled space science benefits humanity responsibly.

As humanity stands on the brink of a new space odyssey, enriched by quantum physics, the article concludes with a call for bold imagination and cautious application. By embracing the weird yet wonderful qualities of quantum science, humanity's quantum voyage may illuminate mysteries of the universe, guided by a collective and ethical moral compass.



Acknowledging the early stages of quantum computing, the need for strategic planning and preparation to be 'quantum ready' has been emphasized



Telkom Indonesia Launches New Satellite

State-owned Telkom Indonesia has successfully launched the Merah Putih-2 satellite, formerly known as Telkomsat HTS 113BT. The launch is needed to strengthen the connection infrastructure across Indonesia, particularly in remote or underserved areas, where terrestrial infrastructure might be lacking or inadequate. The Merah Putih-2 satellite can help expand broadband coverage, improve internet connectivity, and enhance communication services nationwide.

Bridging the Digital Gap

The satellite, built on Thales Alenia Space's Spacebus 4000B2 platform and named after the colors of the Indonesian flag, has a capacity of more than 32Gbps. The deployment of the satellite aims to revolutionize digital enterprises by delivering an improved level of service and bridge the digital gap in the remote locations in Indonesia.

Telkom Indonesia's subsidiary, Telkomsat, partnered with Thales Alenia Space in 2021 for the development of a High Throughput Satellite. The Merah Putih-2 satellite, Telkom Indonesia's 11th satellite, had a launch mass of four tons and will operate in the C-band/Ku-band. The satellite will be positioned in orbit at 113 degrees east with a fifteen-year life span, according to calculations.

Thales Alenia Space— the prime contractor— was responsible for overseeing all aspects of the satellite's development, including its design, building, testing, and on-ground delivery. The company was also responsible for the ground control segment and providing Telkomsat engineers with full theoretical and hands-on training sessions.

EU Contemplates Mandating Big Tech to Pay for Telecom Network Update

European telecommunications companies, including Orange and Vodafone, have long urged the European Union to make tech and streaming titans pay for the massive amounts of bandwidth they consume. The concept is controversial and sparked heated debates last year. On one side, telecom companies argue that they invest substantial resources in building and maintaining infrastructure to meet the increasing demand for data transmission, and it's only fair that digital giants share the burden of these costs. They argue that this would create a more equitable distribution of expenses related to the digital ecosystem.

Conversely, tech groups argue against such measures, contending that telecom companies already generate revenue through customer subscriptions and should not seek additional compensation from tech companies. They raise concerns about the potential negative impact on innovation and consumer choice if these costs were passed on

to digital platforms and streaming services, potentially leading to increased subscription fees or reduced service quality.

Furthermore, digital rights advocates express apprehensions that implementing such policies could result in a two-tiered internet system, where companies able to afford additional fees gain preferential treatment over smaller players. They emphasize the importance of preserving net neutrality and ensuring equal access to online services for all users, regardless of their financial resources.

Notable Considerations

Big tech hoped the issue would die last year, but a document from the European Commission suggests that some officials in the bloc still believe it can be revived. "The Commission may consider broadening the scope and objectives of the current regulatory framework to ensure a level playing field and equivalent rights and obligations for all actors and end-users of digital networks," it said.

Indonesian Telcos Enhance Security with New API Services

Indonesian telcos have launched new API services that aim to improve security and customer experience as part of the GSMA Open Gateway initiative. Failure to integrate APIs from the GSMA Open Gateway could have significant repercussions for Indonesian telcos. Without access to these APIs, telcos may struggle to implement enhanced security measures and deliver superior customer experiences, leaving their networks and customers vulnerable to cyber threats and dissatisfaction.

Additionally, the lack of integration may lead to non-standardized practices and interoperability issues, hindering collaboration and innovation within the telecommunications industry. Ultimately, telcos that fail to integrate GSMA Open Gateway APIs risk losing their competitive edge as they lag behind competitors in delivering innovative services and responding to market demands.

Ground-Breaking Services Enhancing Security

According to the GSMA, Indonesian telcos Telkomsel, Indosat Ooredoo Hutchison, XL Axiata, and Smartfren have launched Number Verification, SIM Swap, and Device Location services using Open Gateway APIs.

The Number Verification service simplifies mobile number verification for users, ensuring strong authentication and a consistent experience while addressing issues such as SMS delivery failures or user technology challenges.

The SIM Swap service will detect recent changes in SIM cards associated with a phone number, which is critical for avoiding account takeovers, particularly during financial transactions.

Verizon, Samsung and Keysight: Empowering a More Open, Interoperable Environment

Leveraging Samsung's extensive expertise in the vRAN and Open RAN global markets, Verizon and Samsung have expanded their collaboration a step forward by embracing openness.

Samsung Electronics have completed Open RAN conformance and interoperability testing for commercial-grade LTE and 5G NR radios for Verizon's network. The continued collaboration between Samsung and Verizon reinforces their commitment to the Open RAN and leadership in enabling virtualized open networks with greater flexibility, faster time-to-market, and unmatched performance.

Open RAN Conformance Testing

For the series of tests carried out in Samsung's Dallas, Texas lab, the companies used Samsung's market-leading radios compliant with O-RAN specifications. The test included multiple Samsung radios including CAT-A radios 4T4R supporting 700/850 MHz and AWS/PCS bands, CAT-B 64T64R Massive MIMO C-Band

radios, and the 16T16R C-band and CBRS dual-band radio.

"O-RAN is a very important component of our network evolution strategy," said Steven Rice, Vice President of Network Planning at Verizon. By leveraging O-RAN radios and software-driven infrastructure with industry-leading partners like Samsung and Keysight, we continue to drive the industry towards a more open, interoperable environment which will provide greater flexibility, greater innovation and better performance for our customers."

The test underscores Samsung's Massive MIMO leadership, specifically with its 64T64R Massive MIMO radio, which Verizon has already deployed throughout its large-scale commercial vRAN networks nationwide. Results from the test illustrate Samsung's capability to handle advanced Massive MIMO radios integration, which is more complex for 64T64R Massive MIMO radios, in comparison to simple CAT-A radios.

Ghana Plans to Boost Rural Connectivity

The Ghanaian government is planning to construct and implement 1,006 telecom sites this year to enhance mobile service coverage in the country, particularly in rural areas.

These telecom sites are part of the "Ghana Rural Telephony and Digital Inclusion" project unveiled in November 2020 by the Ghana Investment Fund for Electronic Communications (GIFEC) to address the digital divide by strengthening basic telephony services in rural areas.

The project receives technical support from the Chinese company Huawei and financial backing from the China Exim Bank, which provided \$155 million in financing to the government in 2020.

Out of the planned 2,016 telecom sites, 1,010 have already been constructed, and 618 are operational. This development allows citizens in approximately 1,620 rural communities to make calls and use data services. Ultimately, the project aims to benefit around 4 million people.

According to the latest statistics from the National Communications Authority (NCA), Ghana had 38.4 million mobile phone subscribers in the first quarter of 2023, with a penetration rate of 120.2%. The number of subscribers to mobile internet services stood at 22.6 million, covering approximately 71% of the population. However, these figures may be lower in reality, considering that some individuals own multiple SIM cards.

TELUS and AWS Revolutionize Roaming: Traffic Bypasses Canada

TELUS will become the first telecommunications provider in North America to evolve the architecture of roaming, enabling greater reliability and faster speeds for customers traveling abroad.

TELUS, Amazon Web Services (AWS) and Samsung Electronics announced a trailblazing collaboration that will impact roaming traffic (voice, data, and SMS), traditionally routed through the provider's home country. resulting in slower speeds for customers. With the revolutionary new approach, TELUS is able to house their network within AWS Regions worldwide, using virtualized roaming gateways. This means that traffic no longer needs to go through Canada, but will be routed directly to the closest AWS Region that houses TELUS' network, significantly enhancing the speed and responsiveness of mobile services. This process, termed network cloudification, leverages Samsung's cloudnative Core technology deployed on public cloud infrastructure for mobile data, alongside ng-voice for voice calls. This approach optimizes performance and enhances overall quality.

"This architecture evolution further strengthens TELUS' commitment to keeping our customers connected to what matters most, ensuring they are able to enjoy the same award-winning experience they have in Canada from anywhere in the world," said Nazim Benhadid, Chief Technology Officer at TELUS. "Together with AWS, Samsung and ng-voice, we are making roaming more reliable and resilient than ever."

Brazil and UAE to Accelerate Falcon Al Adoption

The UAE's Advanced Technology Research Council (ATRC), mandated to shape an advanced R&D ecosystem in Abu Dhabi and drive the strategic research priorities of the UAE, signed a Memorandum of Understanding (MoU) with the Secretariat of Management and Digital Government (SGGD) of the State of São Paulo in Brazil, on the sidelines of the World Governments Summit (WGS) 2024.

This synergy aims to leverage the technical expertise of ATRC and its subsidiaries for the seamless integration of Artificial Intelligence (AI) into São Paulo's technological infrastructure and government services.

Under the terms of the agreement, São Paulo will explore and drive the adoption of Falcon Large Language Models (LLMs) and Falcon-powered solutions, as well as support the use of Falcon within its digital ecosystem across diverse use cases. Furthermore, São Paulo will urge organizations and entities to join the Falcon Foundation and contribute to the advancement of open-source Falcon models. The partnership marks a significant stride in exporting Falcon's capability at a state level beyond the Middle East, laying the groundwork for global collaborative initiatives that will define the future of technological innovation.

Expressing optimism about the alliance, H.E. Faisal Al Bannai, Secretary General of ATRC said, "Working hand-in-hand with the government of São Paulo, we look forward to supporting the adoption of Falcon's innovative solutions across various organizations in the country and establishing a pioneering model for international cooperation in shaping the future of Al."

AT&T, FirstNet Authority's 10-Year Investment to Transform Public Safety Communications

The FirstNet Authority and its network partner, AT&T are announcing a major investment in the future of public safety communications. The FirstNet Authority's 10-year, \$8 billion investment initiative will evolve and expand FirstNet® — America's public safety network.

The FirstNet Authority plans to invest \$6.3 billion through its network contract with AT&T and anticipates an additional \$2 billion for ongoing investments in coverage enhancements for public safety, which is currently under discussion by the parties. These strategic investments will expand and evolve FirstNet so public safety stays at the forefront of innovative, lifesaving technologies.

"We are dedicated to the future of public safety communications, and that starts with expanding and evolving FirstNet to meet first responders' needs," said Joe Wassel, Executive Director and CEO, FirstNet Authority. "With this investment, we are ensuring FirstNet remains at the forefront of technology so that public safety can respond smarter, safer, and more effectively. I look forward to our continued partnership with the public safety community and AT&T to deliver the most reliable, innovative communications network for public safety."

As public safety's partner, AT&T has already grown FirstNet — the only network built with and for America's first responders and the extended public safety community — to cover more first responders than any network nationwide.

With more than 5.5 million connections and about 27,500 public safety agencies and organizations on FirstNet, first responders can reliably communicate with one another during everyday operations, big events, emergencies in the field and more.

European Commission Approves Orange and MásMóvil Merger in Spain

Orange and MásMóvil have received permission from the European Commission to merge their operations in Spain.

The combined activities of Orange Spain and MásMóvil will be carried out through a 50-50 joint venture, co-controlled by Orange and MásMóvil (LORCA JVCO), with equal governance rights in the combined entity.

The collaboration between MásMóvil and Orange will establish a prominent operator within the Spanish market, boasting a superior customer base, enhanced user experience, top-tier talent, extensive fiber and mobile coverage, and long-term viability. This partnership will also position the entity as a significant investor in Spain's telecom infrastructure development,

ensuring sustained growth and innovation in the sector.

Both parties will merge to form a leading operator, combining the assets, capabilities, and teams of the two Spanish companies to serve 7.3+ million fixed customers, 30+ million mobile customers, and 2.2+ million TV customers. The Joint Venture will manage critical network and IT assets to ensure nationwide coverage for both FTTH and 4G/5G.

Financially, the merger will result in a more robust and stable entity in the market, boasting projected revenues exceeding EUR 7.4 billion and an EBITDAaL surpassing EUR 2.3 billion. With an enterprise value of EUR 18.6 billion, the combined company anticipates achieving synergies of over EUR 450 million annually, starting from the fourth year post-completion.



WE'RE ON INSTAGRAM!



FOLLOW US TO KNOW MORE ABOUT THE LATEST ICT TRENDS!

instagram.com/telecom_review

— 2024 —

GISEC

GISEC Global provides vendors and companies from around the world with access to lucrative opportunities in cybersecurity, one of the world's booming markets.

Place: Dubai World Trade Center, UAE





23 -25

FutureNet MENA

FutureNet Middle East & North Africa addresses the strategic and commercial elements of the current digital landscape, with focus on the future trajectory of network development. Its key mission is the advancement of the 'Network Automation and Al' agenda, regarded as a foundational element driving the wave of growth in the telecom sector.

Place: Conrad Hotel, Dubai, UAE



14 - **X** 15

COMEX

At COMEX 2024, explore innovative business solutions presented by local and international companies, discover trends in the latest technologies revolutionizing the GCC and the world, and connect with global thought leaders, innovators, and policy and decision-makers

Place: Oman Convention & Exhibition Centre, Muscat, Oman



20 -23

CABSAT

The premier gathering for professionals in the content, broadcast, satellite, media, and entertainment industries in the Middle East & Africa, seeking to harness cutting-edge technology and innovation in shaping the next generation of content

Place: Dubai World Trade Center, UAE



DTW24 - Ignite

DTW24 - Ignite will explore the dynamic path of the AI Native journey. Learn from the industry players and experts about the fundamentals and best practices of this ever-evolving technology to unleash the power of AI for transformative innovation.

Place: Copenhagen, Denmark



18 - **N** 20

Latest updates on: www.telecomreview.com



telecomreviewgroup.com











Visit **telecomreview.tv** and get enlightened about the latest news, trends, services, projects and plans in the ICT industry, featuring fundamental interviews with esteemed leaders in the telecom and ICT sector.

Leading Global ICT Media Platforms

Middle East Arabia Africa







North America



Asia

