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IoT NOW

HOW TO RUN AN IoT ENABLED BUSINESS

TALKING HEADS

Infineon's Adam White sets out how green data centres will handle IoT demands

IoT Now Guide to MWC Barcelona 2023

PLUS: Sierra introduces smart connectivity with eUICC while KORE and AWS deliver IoT SAFE offering • When no room at the inn is a sign of success • Eseye launches AnyNet SMARTconnect software • 1NCE launches new OS • How to achieve a health-conscious lifestyle using the power of IoT • News, features and interviews online at www.iot-now.com

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When no room at the inn is a sign of strength

I have an unusual indicator of the scale and impact of each MWC Barcelona that I've come to rely on over the last 10 years or so. There's a charming if basic family-run hostel close to the city's Poble Sec underground railway station that is top of my list when booking accommodation for the duration of the event. I first used this hostel way back when the event was held at the Fira de Barcelona rather than at the far larger Fira Gran Via site

George Malim,
managing editor

It met and still meets all my requirements, occupying the intersection of a complex Venn diagram of price, proximity, security, cleanliness and, of course, Wi-Fi. For the first few years, all was well and I could easily book a room, recognising a cohort of MWC attendees with similar criteria in the hostel's corridors. However, shortly after the event's relocation to Gran Via, which reduced the hostel's appeal slightly because of the extended commute, the price began to edge up. By the time MWC Barcelona hit attendee numbers in the low six-figures, the hostel was not only losing its appeal on proximity but also on price. Then, a few years before the pandemic, crisis struck and no rooms were available.

This was in the October before the following year's event and that concluded my regular occupancy. There are several variables at play here. Much depends on the performance of the mobile industry. In years in which big investments are being committed to, vendors' spend on hospitality is highly evident. You can see chauffeurs driving black Mercedes that originate from as far away as Germany according to their number plates and catering crews, stand-builders and entertainers are drawn from all over Europe.

They all need somewhere to sleep and my hostel has become top of their lists too. The situation can also be worsened by Formula 1 testing if it is scheduled in the same week, which happens, and the football activities at Camp Nou, that can bring further tens of thousands of fans to the city.

Last year, as MWC Barcelona recovered from the pandemic and held an in-person event again, I left my decision to attend relatively late yet was still able to book my preferred accommodation in early January. That's reflected in last year's attendance figures which the organisers claim to have been 60,000. This is far fewer than the 109,000 reported in 2019 and explains why there was a room at the hostel for me last year.

This year will be a different story. Travel is back on. In spite of lingering pandemic constraints, the war in Ukraine and inflation, the mobile industry is buoyant with huge network builds continuing and innovations bringing new revenues. Sadly, even though I attempted to book a room last October, there is no room at the hostel for me this year. That's good news for MWC Barcelona and a good indicator of the mobile industry's health.

Enjoy this Guide and the show, however you attend it.

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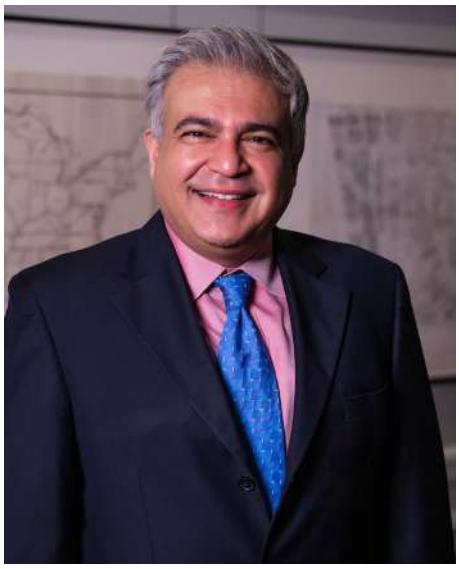
KORE and AWS deliver IoT SAFE solution for IoT use cases

KORE, a global provider of Internet of Things (IoT) solutions and worldwide IoT Connectivity-as-a-Service (CaaS) provider, is using **Amazon Web Services (AWS)** to simplify deploying, managing and securing massive IoT solutions. KORE has introduced its OmniSIM SAFE using AWS IoT Core to decrease security challenges associated with global massive IoT and large-scale IoT deployments.

The KORE OmniSIM SAFE connectivity offering is an innovative eSIM approach that uses **GSMA**'s IoT SIM Applet For Secure End-2-End (SAFE) standard. This standard enables device manufacturers and IoT providers to use the SIM as a root of trust to protect IoT data communications. This enables a standardised, device-level approach to security. AWS IoT Core connects with the SIM to simplify secure device provisioning and management, as well as message routing to AWS services. From deployment to management, this is a holistic approach to widespread device security and dovetails with massive IoT, because the KORE OmniSIM SAFE supports zero-touch provisioning pairing device to cloud with minimal physical intervention.

"IoT is positioned to grow exponentially through this decade as organisations seek ways to optimise and streamline operations," says Romil Bahl, the president and chief executive of KORE. "An estimated 75 billion devices are expected to be connected by 2030, but with those connected devices comes a unique set of challenges. IoT security can be an area of concern across industries due to a lack of



Romil Bahl, KORE

standardisation and a fragmented ecosystem this broadened landscape of devices exposes more security attack surfaces in kind."

KORE launched its OmniSIM SAFE solution working with **Energy Web**, a non-profit organisation focused on building open-source software to accelerate the energy transition. The Energy Web stack enables enterprises to build and operate production-grade applications by adopting decentralised technologies. One of the significant aims of Energy Web is to lower the use of carbon to meet global decarbonisation targets.

Sierra Wireless introduces Smart Connectivity Premium with eUICC capabilities

Sierra Wireless, a subsidiary of **Semtech** has introduced its Smart Connectivity Premium offering with embedded universal integrated circuit card (eUICC) capabilities and extended connectivity coverage in the United States. With universal coverage across geographies and technologies with one global SIM, the offering provides resilient IoT managed connectivity that is future proofed with its multi-international mobile subscriber identification (IMSI), multi-profile design enabled by **GSMA** eSIM (eUICC) specifications. The SIM dynamically switches between profiles and networks when one becomes unreachable, offering maximum coverage and built-in failover in over 190 countries. In addition, it provides customers with access to all three major carrier networks in the US.

"Sierra Wireless has been a valued partner of **Kigen** for many years," said Jean-Philippe Betoin, the senior vice president of Ecosystem Development at Kigen. "This new offering enables customers access to more networks via Kigen eSIM, enabling future-proofed IoT managed connectivity for global applications. With industrial IoT increasingly becoming business-critical, resilient connectivity options are essential."

Ross Gray, the vice president of Semtech's IoT Connected Services Group, added: "Sierra Wireless' Smart Connectivity service simplifies how customers connect and manage their deployments. With one global SIM, it accelerates IoT time-to-market, ensures resilient global coverage, maximises uptime, reduces operational costs, and provides IoT customers with seamless expansion into new markets with access to over 600 partner networks in more than 190 countries.

News in Brief

BICS selects Infovista for SaaS

Infovista, a global provider of network lifecycle automation, has announced that **BICS** has deployed its Automated Assurance & Operations system to power its suite of advanced analytics systems for its telecoms and enterprise customers.

BICS' Software as a Service (SaaS) solutions use detailed, near real-time traffic insights from Infovista's Automated Assurance & Operations to help customers rapidly build advanced reporting capabilities, in turn increasing operational efficiency and strengthening their competitiveness. Customers use the intuitive platform to identify and correct bottom-line impacting network, service and security-related issues and deliver the best possible end-user experience across 3G, 4G and 5G networks globally.

5G IoT to exceed 100m connections by 2026

A new study from **Juniper Research** has found that 5G IoT connections will reach 116 million globally by 2026, rising from 17 million in 2023. The research examined 5G adoption across key sectors, such as the automotive industry, mobile broadband and smart homes, and forecasts that the healthcare and smart cities market will account for over 60% of 5G IoT devices by 2026. The ultra-low latency and high bandwidth of 5G IoT technology will be the key factors in driving this proliferation of new connections.

Research co-author Olivia Williams, said: "5G will enable more efficient and dynamic healthcare provision that was not feasible with 4G or Wi-Fi. However, healthcare providers must first implement 5G in areas which provide a strong return on investment; most notably connected emergency services."

News in Brief

Digi launches ConnectCore

Digi International, a global provider of Internet of Things (IoT) solutions, connectivity products and services, has launched two Digi ConnectCore software service offerings: Digi ConnectCore Cloud Services and Digi ConnectCore Security Services. The offerings provide greater manageability and security for devices developed with Digi's complete line of ConnectCore system-on-modules (SOMs).

"Digi ConnectCore Services continue our mission to reduce the complexity OEMs are facing with implementing full end-to-end industrial IoT solutions and simplifying device security and management for our customers," said Andreas Burghart, the senior product manager for Digi's embedded division.

Airgain and DT offer EMEA asset tracking

Airgain, a provider of wireless connectivity solutions, has formed a partnership with **Deutsche Telekom** IoT to connect its asset tracking devices. The agreement will allow Airgain to bundle connectivity from Deutsche Telekom IoT with its asset tracking customers across Europe, the Middle East and Africa (EMEA) as well as within the US and beyond.

"Adding Deutsche Telekom IoT as a connectivity partner gives Airgain additional global reach," said Morad Sbahi, the chief revenue officer of Airgain. "They are a world-class partner with broad capabilities and a world-class signal. Airgain is excited to partner with one of Europe's top IoT innovators."

Eseye launches AnyNet SMARTconnect software

Eseye, a provider of cellular IoT connectivity solutions, has launched its AnyNet SMARTconnect on-device connectivity software. The new software embeds intelligent, global IoT connectivity directly into any device, enabling organisations to get to market faster and focus on creating value for their customers. In addition, AnyNet SMARTconnect increases resiliency, keeping devices connected and optimised both now and in the future.

Supplied as an independent plug-in software module, AnyNet SMARTconnect codifies Eseye's decades of connectivity expertise into flexible device software that partners and customers can easily integrate into their IoT or connected device. This helps ensure 'right first time' delivery and provides the flexibility of device design to help future-proof the solution to navigate current and future supply chain issues. It supports global deployments by enabling a single SKU, including initial bootstrap and provisioning. AnyNet SMARTconnect allows enterprises to bypass software development and install plug-and-play connectivity intelligence directly into their devices. This can accelerate a product launch by up to nine months, significantly reducing costs and allowing them to focus on the applications and data that deliver value to their customers.

"The Kaleido 2022 Enterprise IoT survey of 750 global enterprises, who had implemented at least one IoT project, revealed that 84% of them ranked the complexities of designing an IoT device as their number one issue they experienced," said Nick Earle, the chief executive of Eseye.

Nick Earle, Eseye

"Enterprises are not device experts and do not have the budget or the necessary skills, such as firmware design and testing, to achieve this. This clearly illustrates that a standard embedded connectivity software solution is needed to enable the device with the intelligence to operate in different environments, detect connectivity, and optimise across multiple constraints, including battery performance, latency and security."

Eseye customer **AmericanPharma** has embedded the AnyNet SMARTconnect software into PharmaWatch, its environmental monitoring devices for the medical industry, for its vaccine temperature monitoring during COVID. The solution has enabled it to experience improved coverage across the US and allowed it to expand its PharmaWatch application globally.

Rockwell Automation announces ThingWorx IIoT has helped boost machine utilisation by 162.5%

Rockwell Automation, a provider of industrial automation, has announced that it has helped **Falcon Group** to boost its machine utilisation by 162.5% using the ThingWorx IIoT platform, part of the FactoryTalk InnovationSuite, powered by **PTC**. Headquartered in Dubai, Falcon Group comprises five industrial operations. One of these is a specialist precision engineering and fabrication company that caters for the demanding needs of customers in the aerospace, automotive, marine, healthcare, defence, oil and gas, and steel industries. At the heart of its operations are 16 CNC machines, all of which are essential to the company's machining capabilities.

Before support from Rockwell Automation, Falcon Group was considering purchasing additional CNC machinery to keep pace with customer demand and to support maintenance downtime for critical machines. When at peak capacity, to meet order dates, the company had subcontracted work to competitors. But before signing off on additional machinery, the company decided to assess its current asset utilisation.

Prabhu Badrinathen, the chief executive of Falcon Group, said: "We are always looking for ways to do things better and deliver even greater levels of service to our customers. We knew we had room to grow our machine utilisation, but it was not until we got the real-time, machine-level insights from the ThingWorx platform that we realised where inefficiencies were and where the changes needed to be made."

Sateliot and Sensefinity launch 5G IoT satellite technology to prevent cargo damage

Jaume Sanpera, Sateliot

Sateliot, a satellite constellation offering 5G standard connectivity from space, and **Sensefinity,** an IoT provider of asset tracking, have launched global 5G narrowband-IoT (NB-IoT) satellite connectivity. This will reportedly facilitate the data transmission technology from 1,000 smart containers saving medium-sized shipping companies up to US$1.4 million per year on container maintenance and repairs.

Actual satellite coverage is not 100% globally, as geostationary satellites only cover fixed areas of the planet. Moreover, their placement makes them much less efficient than low earth orbit (LEO) satellites, which come into play to fix this problem. Without narrowband IoT (NB-IoT) coverage at sea, trackers and sensors can only record the information, uploading it once the vessels are near shore, when it is already too late to do anything about damaged cargo. Furthermore, legacy satellite transmission costs for every container are a large addition to a vessel's already expensive bills, particularly when considering tariffs and port and channel fees.

With Sateliot's full 5G NB-IoT satellite constellation, Sensefinity will be able to report location, temperature, humidity, vibration and container breach in real-time, unlocking a set of high-impact use cases such as notifications when a container falls into the ocean, alerting for fires inside containers, warning for cold-chain breaks for sensitive cargo like food and medicines and reporting impacts and damages in containers.

Jaume Sanpera, the chief executive of Sateliot, said: "Investing in smart containers and global continuous connectivity transmission through our network of 5G NB-IoT satellites will provide vessels and shipping companies better control of transported goods, avoiding damage claims and lawsuits costing companies billions of dollars per year."

1NCE expands IoT software business with launch of new OS

Ivo Rook, 1NCE

1NCE has announced the creation of its software business unit following the launch of 1NCE OS – the company's IoT software offering developer tools and device control to make IoT even more accessible. The software tools are an integral part of 1NCE's Lifetime Flat service and are available free to 1NCE customers.

1NCE OS is designed to enable easy integration of 1NCE's connectivity and software features into IoT projects of any scale, for new and existing projects alike. Using 1NCE OS for device and cloud integration, customers can accelerate time-to-market for IoT projects by months. One of 1NCE's core principles is that customer data isn't to be monetised and used to sell additional services. Instead, 1NCE is transparent about turning data into tools that are included in the global lifetime flat rate.

Ivo Rook, the chief operating officer of 1NCE, said: "1NCE flips the script for customers – we don't monetise their data for a few extra dollars because our customers' data is theirs and theirs alone. 1NCE's move into software allows us to boost our customers' ideas not just when they need connectivity, but from the outset of their projects and all the way through a device's lifecycle. IoT connectivity and software for life for a single fee, and that's it."

News in Brief

Netmore divests M2M business to Melita

Maltese telecoms and IoT operator **Melita** is acquiring **Netmore Group**'s wholly owned subsidiary Netmore M2M AB (Netmore M2M) for an initial cash purchase price of US$1.88m, plus a conditional additional cash purchase price of up to a further US$2.8m. Netmore Group launched the Netmore M2M business in 2019 as part of its then business strategy to target the European market for SIM cards based IoT connectivity. The subsidiary has grown steadily since its formation and today has more than 300 customers in over 30 countries.

Through this transaction, these customers will have new tools for SIM card based IoT project deployment as Melita brings a proprietary connectivity portal with increased functionality, extensive IoT SIM roaming coverage, as well as additional security options. Melita is licensed and regulated in Malta and operates its international IoT business under the brand melita.io.

Blues Wireless raises US$32m

Blues Wireless has announced a US$32m Series A1 funding round led by **Positive Sum**, and including new investors **Four Rivers**, **Northgate** and **Qualcomm**. Previous backers **Sequoia**, **Cascade**, **Lachy Groom** and **XYZ** also participated.

"Even in these difficult economic times, enterprises will not hesitate to invest in transforming their physical products to be capable of remote monitoring and control," says Ray Ozzie, the founder and CEO of Blues. "To date, connecting products to the cloud using cellular has been a time-consuming and expensive endeavour, fraught with risk. Complexity kills. Blues has taken a developer-centric approach that simply eliminates complexity, from device to cloud, enabling products realistically to go from prototype to scale deployment in months instead of years."

Decarbonisation demands data centre energy efficiency at IoT scale

As enterprises of all types embrace IoT there is an opportunity to run operations more efficiently, with less complexity and a smaller environmental footprint. However, IoT is also contributing to substantial volumes of data storage, processing and analytics which is putting pressure on data centre capacity and, in turn, increasing power consumption and cooling requirements at data centres. In order to meet their green targets, organisations need to not only think of how IoT use cases are helping at the point of use but also how to mitigate the impact of the increased utilisation of data infrastructure.

Adam White, the division president for Power and Sensor Systems at Infineon, tells George Malim, the managing editor of IoT Now, that efficiencies are being made and technologies such as wide bandgap with gallium nitride (GaN) and silicon carbide (SiC) semiconductors are offering fundamental advantages over silicon. In data centres, these technologies are enabling progress to be made in reducing carbon emissions towards the net zero goal

George Malim: With the radical increase in both data traversing the internet and the 25-fold projected growth in demand for data centre storage, it's clear that efficiencies need to be improved if organisations are to meet their environmental targets. How is Infineon helping make data centres greener?

Adam White: As number one in power semiconductors, **Infineon** offers a wide range of solutions to make data centres greener. Our products are used in highly efficient power supplies for servers, uninterrupted power supplies, battery back-up solutions and voltage regulators to power the most demanding computing processes with the highest efficiency. Energy efficiency and decarbonisation is at the core of our solutions.

Although much progress has been made, the amount of energy consumed by data centres is increasing, but at a rate that is far slower than data growth. This growth is energised by our digital lifestyle with streaming and gaming, ▶

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working from home, remote education, digital healthcare, crypto-currency and the metaverse. Digitalisation is the key to progress, innovation and a better life. Just look at the metaverse with its new and fascinating ways to learn and to interact. Digital twins for example are not just for industry to simulate their production lines or a smart building. Everybody can either learn in a digital world or interact with other people around the world in a totally new, immersive way. Virtual reality and augmented reality will open up a new world. The metaverse expands our lives to a new dimension. And all this is linked with enormous data growth.

We need to step up our efforts in order to reduce CO2 emissions and reach the net zero goal. In particular, we need new technologies like wide bandgap with GaN and SiC semiconductors. They offer fundamental advantages over silicon. For example, GaN technology is driving higher power density, maximum energy efficiency and smaller system size. Infineon offers a broad range of system reference designs for both ACDC and DCDC to exploit the full value of GaN-based power switches. These systems are achieving higher efficiency and density with robust, high-quality and reliable products. This results in an amazing win for our climate. Let me give an example: If every data centre worldwide used the respective Infineon solution CoolGaN, we could save up to 10 megatons of CO2 emissions.

GM: Are the main gains to be made in power and cooling efficiencies and which technologies are driving performance improvements in these areas?

AW: The key topic is to address the architectural level. Thinking out the uninterruptable power supply and delivering battery back-up power at DC in a parallel power path improves the overall power flow by at least 4-6%. Such architectures are used today in hyperscale data centres and are addressed, for example, in the Open Compute V 3.0 standard.

Let's a have a look at the important key performance indicator of a data centre, the Power Usage Effectiveness (PUE). It divides the total power delivered to the data centre by the actual power consumed by the IT equipment. The ▶

Adam White
Infineon

We need to step up our efforts in order to reduce CO2 emissions and reach the net zero goal. In particular, we need new technologies like wide bandgap with GaN and SiC semiconductors

All the benefits of smart building technologies can also be applied to data centres

perfect PUE value is 1.0, when all power required for a data centre would be in the actual computing devices, not in cooling or power conversion.

According to recent research, IT and data centre managers report an average annual PUE ratio of 1.57 at their largest data centres. So, there's room for improvement in terms of uncontrolled cooling and power costs, along with reducing the CO2 footprint.

Wide bandgap technology is the most important development in the power semiconductor area, taking efficiency of energy conversion to a new level. We at Infineon offer a broad product and technology portfolio including silicon and the innovative technologies for silicon carbide and gallium nitride-based devices. They are driving efficiency of data centres.

GM: Please can you tell us more about your demo at MWC with your partner Supermicro Computer that showcases how to reduce the cooling requirements of server rooms?

AW: Supermicro developed a computing platform that can significantly improve PUE. Specifically, the Supermicro MicroBlade family offers the best server density for a variety of processors, up to 112 x 1-socket Atom nodes, 56 x 1-socket Xeon nodes, and 28 x 2-socket Xeon nodes in a 6U rack unit. The MicroBlade can provide up to 86% power efficiency improvement and 56% density improvement when compared to standard 1U rackmount servers.

The MicroBlade server uses our OptiMOS-based integrated power stages TDA21490 and TDA21535. The TDA21490 enables a robust and reliable voltage regulator design for high performance. It offers best-in-class efficiency with its OptiMOS power MOSFETs in a thermally efficient package. In addition, operation at a switching frequency of up to 1.5 MHz enables high-performance transient response and allows output inductance and capacitance to be reduced while maintaining industry-leading efficiency.

GM: What other technical approaches that help optimise utilisation and minimise wasted capacity are being adopted? How do these contribute to reducing the environmental impact of data centres?

AW: All the benefits of smart building technologies can also be applied to data centres. Of course, the actual server rooms are already ▶

fully air-conditioned, but it's also about efficient lighting control, intrusion detection and the rooms for employees directly in the data centre. The rooms can be intelligently managed through presence detection and automatic control of energy consumption for lighting and air conditioning, too.

Infineon has a wide technology portfolio of sensor and microcontroller solutions for all these smart building technologies. We provide holistic energy efficiency solutions.

GM: As connectivity in IoT enables billions more devices to connect, especially in the case of 5G, with very high data capacity, will technologies like edge computing be used to lighten the load on centralised data centres? How does Infineon see this playing out and what enabling technologies are you providing?

AW: Yes, these technologies will help. Edge computing is a growing topic in our business. The key advantage for edge computing is latency, network capacity and security. Corresponding to the slogan 'compute follows data', processing data at the edge reduces data traffic, thus relieving the networks, data centres and energy consumption. Much more, it ensures faster responses, because no time is lost in sending sensor data, analysing the data in a data centre and sending back control commands, for example. Additionally, data that doesn't leave the edge provides a smaller attack surface.

Microcontrollers become more important to safe and secure real-time applications. In addition to energy efficiency, security is also a major topic at Infineon. We offer best-in-class security solutions used in the automotive and financial industries. That's why Infineon is developing new computing, artificial intelligence (AI) and edge encryption solutions.

GM: How do you see Infineon's role in supporting the future of sustainable data centres?

We are engaged in a lively exchange with our customers. We understand their needs. That's the reason behind our 'from product to system' approach. We offer the knowhow for digitalisation and decarbonisation. This is the focus of our corporate strategy and is at the centre of our entrepreneurial activities. We will continue our previous successes for the sustainable data centre of the future. The key for the essential step towards higher energy efficiency is the use of new technologies and materials such as GaN. Infineon is an industry leader in power management technology, with over 20 years of innovation in GaN and owning one of the largest IP portfolios.

Infineon is an industry leader in power management technology, with over 20 years of innovation in GaN and owning one of the largest IP portfolios

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Achieve a health-conscious lifestyle through the power of IoT

Thomas Rosteck, the division president for Connected Secure Systems, and Adam White, the division president for Power and Sensor Systems, at Infineon explain how smart semiconductor solutions can influence personal health

Smart devices and wearables are interwoven with countless activities in our everyday lives. They make our lives easier, more convenient and help us lead a health-oriented lifestyle. As life expectancy increases and the world's population grows, we need solutions that help us increase our fitness and wellbeing, maintain long-term health, prevent diseases, and provide personalised care in case of illness.

United Nations projections suggest that the global population could grow to around 8.5 billion in 2030 and 9.7 billion in 2050. This development presents the healthcare system with major challenges. In addition, we all want to live healthy, vital and self-determined lives for as long as possible. The topics of preventive healthcare and wellbeing are moving more and more into focus. A smart home can be of great help for tracking vital signs. Good health increasingly means taking responsibility for our long-term preventive care rather than reactively treating acute illnesses. It also places great emphasis on enhancing wellbeing to prevent illness, and it recognises the role of the home as an important factor in individual healthcare.

In addition, younger generations wish for more personalised and self-determined medical services. The ability to monitor health and fitness status at any time makes it possible to detect illnesses and stress at an early stage and to take action against them.

Better health awareness by vital sensing at home

Technology, and with it the Internet of Things, has the potential to support the healthcare sector across all levels – with predictive prevention and monitoring, in diagnosis and treatment as well as in follow-up care and support in daily life. Today, various health and fitness devices can already track key health parameters such as heartrate and blood pressure, can record and evaluate irregularities and can also share the information in real-time. This helps users stay more aware of their own well-being and also allows them to make pro-active decisions regarding their health. But the technology can only unleash its full power if it is trusted and thus accepted. Personal health data is highly sensitive, protecting the privacy of the data therefore more than essential.

The global IoT market trend in medical devices is clearly moving towards 'healthcare is self-care', with a focus on actively involving people and patient-centric care. The vital sign monitoring market segment is expected to grow rapidly.

For example, an unobtrusive smart ring that monitors sleep, activity, recovery, body temperature, heart rate and stress levels can ▶

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Thomas Rosteck
Infineon

Adam White
Infineon

reliably measure vital functions for up to seven days on one battery charge and can identify trends at an early stage. This makes it even easier to consistently and seamlessly record and evaluate physical activities than is already possible with smart or sport watches.

Besides smartphones and smart wearables, other smart health devices already exist that monitor physical activities and thus support an active lifestyle. This is where smart homes come into play. Based on radar technology, sleep sensors, fall detection sensors and vital sensors in general are now small and easy to use. Patients can record their sleep behaviour with high precision at home, without external stress factors and in a comfortable environment – even when covered by bedding.

All this hyper-connectivity is driven by a whole new ecosystem of devices delivering innovative and more advanced levels of contextual awareness. This ecosystem bridges the gap between the real and the digital world with sensors that allow things to see, hear, feel, smell and thus understand their surroundings.

The role of semiconductors

Semiconductors from companies like **Infineon** are essential components in all these solutions, since they support the design of innovative technologies and devices for health-monitoring, preventive healthcare and, in the event of illness, self-treatment and assisted living at home. There can be no IoT without semiconductors.

Sensors record vital data, microcontrollers process and forward it, actuators trigger actions, networking technologies integrate cloud services with medical expertise and security solutions ensure the protection of extremely sensitive personal data. All this data is intelligently networked and wirelessly connected over the cloud to link people with services and information that match their needs and interests. But with more and more data being gathered for analysis, the need for embedded security has never been more important. Personal data and conversations must be protected to continue making IoT trustworthy. Security solutions ensure the protection of extremely sensitive personal data. And this is where come semiconductors into play again.

Using innovative materials, like gallium nitride, can increase the energy efficiency of electronic devices and therefore certain IoT devices will benefit. We undoubtedly will drive digitalisation further with smart solutions to enhance health and life quality. And all this can also be done in an energy-conscious and energy-saving manner – decarbonisation and digitalisation are intertwined.

Besides smartphones and smart wearables, other smart health devices already exist that monitor physical activities and thus support an active lifestyle

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Mobile World Congress Barcelona must show industry progress

Europe's biggest annual technology show in the form of Mobile World Congress (MWC) Barcelona takes place from 27 February. Antony Savvas takes a look at what attendees can expect

With the technology market clearly slowing as parts of the world see recession and other areas fear one, MWC Barcelona will be staged as new technologies and new business opportunities are aired amid uncertainty. However, what we have learned over many years when it comes to mobile technology is that if the technology captures the public's imagination, and if it is clearly useful to businesses, it will usually win through and eventually show traction, no matter what the economic environment.

5G use cases

Now is the time for the mobile industry to make sure it gets its marketing just right, and convinces new and existing mobile customers that 5G isn't just an opportunity to make your downloads go faster and make content streaming more reliable.

To cover the billions of euros, pounds, dollars and yen spent on 5G networks, communications service providers (CSPs), infrastructure companies, service providers, content creators, ▶

and their financial backers, have to showcase the right use cases to enable them to start getting their cash back and much more.

IoT driver

IoT service providers and equipment suppliers have to play a key role in this, driving the mobile industry forward in developing the right sensors and software. Whether this is to support 5G network slicing in industry, helping to build the best systems for the evolving metaverse, making sure the most reliable data analytics are provided to the rapidly growing electric vehicle (EV) industry, or supporting governments who are actively trying to improve the condition of our environment, to name but a few pre-requisites for a more positive mobile industry. The IoT industry has a worthwhile challenge in front of it.

A big draw

More than 2,000 exhibitors and sponsors are expected at this year's MWC Barcelona, at the Fira Gran Via, Barcelona, Spain, on 27 February to 2 March, 2023.

New editions to the show include 'Journey to the Future', the event's first immersive story-telling space, that will offer attendees a "unique, hands-on journey into the future of technology and connectivity solutions", says show organiser the **GSMA**.

"This year, we are going beyond mobile, providing an unmissable space to unleash tomorrow's technology, today. We are on a journey to digital everything, and it will take boundary-pushing powerhouses from across all sectors to truly achieve it," says Mats Granryd, the director general of the GSMA.

Sports Tomorrow

Thanks to the GSMA's collaboration with **FC Barcelona**, Sports Tomorrow Congress will this year be co-located at MWC Barcelona for the first time. It will create a space to identify and create new business opportunities across the mobile and sports industries, in addition to providing a new way for businesses and stakeholders in the sports and technology ecosystem to convene, make deals and launch products.

The theme at this year's show is Velocity, and this will be woven across five key discussion and thought leadership tracks, including 5G acceleration, Reality+, OpenNet, FinTech and Digital Everything.

Key speakers

"Along with our themes, we also want to ensure our content reflects the diversity of the world we live in, and we are delighted to share our latest confirmed speakers, including some of the biggest names in the connectivity industry and adjacent vertical industries, representing markets from around the world," said John Hoffman, the chief executive of the GSMA.

Speakers include Frehiwot Tamru, **Ethio Telecom**'s CEO; Martha Sazon, **G-Cash** president and CEO; Christel Heydemann, **Orange**'s CEO; José María Álvarez-Pallette, **Telefónica** CEO and GSMA chairman; Alejandro Agag, **Extreme E**'s founder and CEO; Vincent Clerc, **Maersk** CEO; Takayuki Morita, **NEC** president and CEO, and Anna Borg, **Vattenfall** president and CEO.

Industry City

Industry City will be returning, supported by sponsors including show Knowledge Partner **Accenture**. The space will showcase innovative demos from across the FinTech, manufacturing and smart mobility industries.

Other returning programmes include 4YFN, MWC's startup-focused platform, to shine a light on the most exciting startups in the digital space. 4YFN will connect startups, investors and companies to launch new business ventures together. It is brought to MWC once more by Platinum sponsor **Banco Sabadell**.

The GSMA Pavilion will host the Mobile World Live Broadcast Studio with live panel discussions broadcast on screens throughout the venue and online. Also at the GSMA Pavilion, there will be the latest innovations in mobile, with demos and immersive experiences such as a mobile IoT football challenge.

Diversity

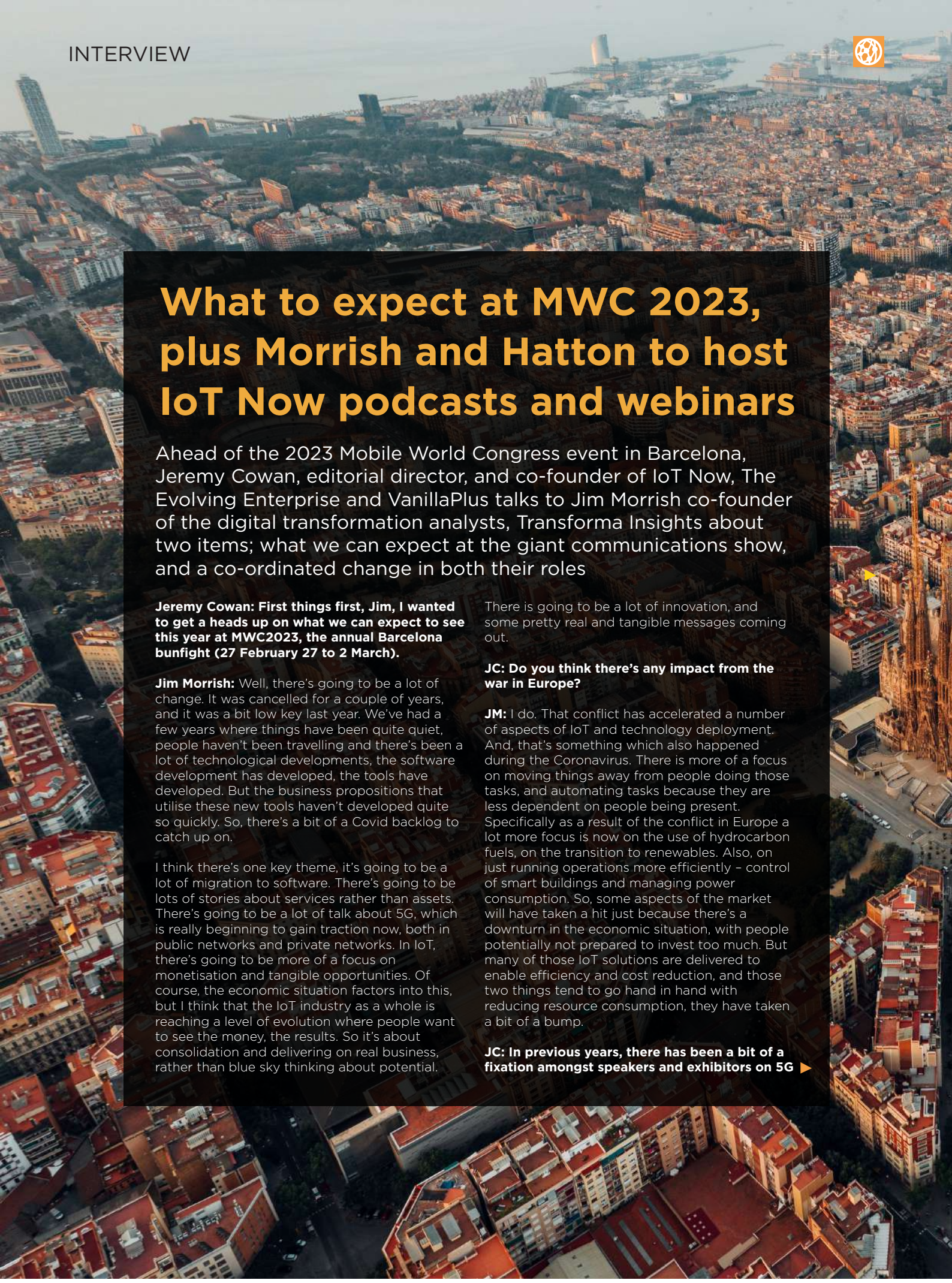
Diversity4Tech returns, "demonstrating the advantages of our differences", says the organiser. In addition, the MWC Ministerial Programme, said to be the largest global gathering of policymakers who enable the digital economy, will convene ministers, heads of regulatory authorities and data protection authorities. They will meet with mobile industry CEOs and senior representatives of international organisations to share knowledge and debate priority policy and regulatory issues.

Other networking events include Beat Barcelona, the MWC and 4YFN official after-work 'Place to B' for networking and entertainment. And the regular Meet & Eat L'Hospitalet shares a delicious look at the local Barcelona gastronomy and culture through a partnership between MWC and L'Hospitalet City Council.

The GSMA expects the 2023 edition of MWC to generate nearly €350 million of economic benefit and 7,400 part-time jobs. More will come after this year too, as the GSMA has signed a deal with the local authorities to keep the event in Barcelona until 2030.

The theme at this year's show is Velocity, and this will be woven across five key discussion and thought leadership tracks, including 5G acceleration, Reality+, OpenNet, FinTech and Digital Everything

www.mwcbarcelona.com



What to expect at MWC 2023, plus Morrish and Hatton to host IoT Now podcasts and webinars

Ahead of the 2023 Mobile World Congress event in Barcelona, Jeremy Cowan, editorial director, and co-founder of IoT Now, The Evolving Enterprise and VanillaPlus talks to Jim Morrish co-founder of the digital transformation analysts, Transforma Insights about two items; what we can expect at the giant communications show, and a co-ordinated change in both their roles

Jeremy Cowan: First things first, Jim, I wanted to get a heads up on what we can expect to see this year at MWC2023, the annual Barcelona bunfight (27 February 27 to 2 March).

Jim Morrish: Well, there's going to be a lot of change. It was cancelled for a couple of years, and it was a bit low key last year. We've had a few years where things have been quite quiet, people haven't been travelling and there's been a lot of technological developments, the software development has developed, the tools have developed. But the business propositions that utilise these new tools haven't developed quite so quickly. So, there's a bit of a Covid backlog to catch up on.

I think there's one key theme, it's going to be a lot of migration to software. There's going to be lots of stories about services rather than assets. There's going to be a lot of talk about 5G, which is really beginning to gain traction now, both in public networks and private networks. In IoT, there's going to be more of a focus on monetisation and tangible opportunities. Of course, the economic situation factors into this, but I think that the IoT industry as a whole is reaching a level of evolution where people want to see the money, the results. So it's about consolidation and delivering on real business, rather than blue sky thinking about potential. There is going to be a lot of innovation, and some pretty real and tangible messages coming out.

JC: Do you think there's any impact from the war in Europe?

JM: I do. That conflict has accelerated a number of aspects of IoT and technology deployment. And, that's something which also happened during the Coronavirus. There is more of a focus on moving things away from people doing those tasks, and automating tasks because they are less dependent on people being present. Specifically as a result of the conflict in Europe a lot more focus is now on the use of hydrocarbon fuels, on the transition to renewables. Also, on just running operations more efficiently – control of smart buildings and managing power consumption. So, some aspects of the market will have taken a hit just because there's a downturn in the economic situation, with people potentially not prepared to invest too much. But many of those IoT solutions are delivered to enable efficiency and cost reduction, and those two things tend to go hand in hand with reducing resource consumption, they have taken a bit of a bump.

JC: In previous years, there has been a bit of a fixation amongst speakers and exhibitors on 5G

use cases or the need for proven use cases. Consumers don't see it like that, obviously. What's your expectation about this year? And dare I ask, are we about to be bombarded with a lot of information of dubious veracity about 6G?

JM: Well, probably yes to both. So, there's going to be a lot of 5G messages around. The reality is there's not a lot of 5G out there at the moment. If I look at the forecast that we have, and the number of 5G non-massive machine type communications (mMTC) connections – so that's the higher speed connections, not the low power wide area (LPWA) connections – at the end of 2022 that was about 1% of the installed base of all cellular connections. So it's still quite a small concept. There's about another 500 million or 29% of cellular IoT connections are the mMTC, LPWA-type 5G connections. So, it's an early story.

But there are definitely use cases. For instance, **GSMA** has an initiative. It has a 5G transformation hub, which illustrates a number of particularly interesting case studies that use 5G technologies. As for 6G, well, one day I guess. As yet, there's no standard for what qualifies as 6G. Although that's not necessarily held back the industry in the past where of course, LTE was branded as something like 3.95G and then rounded to 4G. So, we have found ways around that before. But right now, I think the industry is attempting to digest 5G, it's still early days in that story. There's a lot of things that you can do with it. It's particularly suitable for private networks. And it also enables the control to move out of the network and into the software managing the network, and that allows for a lot more flexibility. And this kind of trend towards software-centric service providers in the IoT space rather than necessarily what we had up until now is many providers essentially tied to hardware and building on that basis. There's a long way to go with 5G before we get to 6G.

"Everyone claimed to have a machine-to-machine story and that transitioned to claiming to have an IoT story, even when they really didn't."

JC: About a decade ago, everyone claimed to have an M2M or machine-to-machine story and then that transitioned to claiming to have an IoT story, even when they really didn't. Is it the same now with artificial intelligence (AI) and the metaverse? I'm sorry, if I sound like a cynical hack, but I am a cynical hack.

JM: I know it seems reasonable. And by the way, somewhere in there blockchain came and went. So yes, we should definitely expect to hear a lot about artificial intelligence (AI) and the metaverse. But this is always going to be the way, the industry's press and conversation and buzz tends to pick up on the new technologies. So, sprinkling a little pixie dust never hurts for these vendors. What is often left behind though, as a legacy is often very tangible. IoT now is a real and very significant thing which is coming of age. Similarly, AI will find itself embedded in all sorts of devices and enterprises' processes over the next decade. Even metaverse, if you can put to one side for a moment the image of legless avatars, it can be a very significant technology. There's a lot of potential for virtual and augmented reality (VR and AR) in an enterprise context. So, for example, take VR; there's a company called **Northdocks** in Germany (**https://northdocks.com**), they've created an ultra-detailed digital twin of Cologne Cathedral using 5G-connected drones. That's a great asset for the stonemasons renovating the building. It avoids the need for scaffolding and allows them views from places which would have been previously inaccessible. Or AR, where, for example, **PTC**'s Vuforia Chalk allows remote experts to provide AR guidance to field engineers. So, there are some really tangible things that sit under that metaverse buzz.

JC: Do you think that as an industry we're shifting our focus quickly enough from the technological innovation that has really been front and centre of everything we've done and has always been exciting to watch, through to the human impacts and changes in society like environmental, social and corporate governance (ESG)?

JM: This is a tough one. Definitely, it's something that I spend some significant time thinking about. We're definitely shifting focus, but there's ▶

Jim Morrish
Transforma Insights

Matt Hatton
Transforma Insights

a real question over whether that's happening fast enough, and how it can happen successfully. So, it's encouraging, for example, to see the work taking place to develop the EU's AI Act. But there's real questions whether that will prove to be a handicap when competing with the USA and Asian countries, or whether it will prove to be to be a benefit. It's hard to call at this point. But, certainly, it to some extent restricts the potential of what can be done with new technologies. I think there's a wider challenge here. And it's one of ambition, because when many folks set out to regulate or to govern these industries, it's, for example, seeking to regulate AI to meet some ideal standards. But you know, it can be proven, for example, that's impossible for machine algorithms to be fair in all contexts, because different people have different definitions of fair. And there's a great example of this in correctional offender profiling in the USA, and this is basically assessing convicts, prisoners on the basis of their probability to reoffend whilst they're out on licence before they've been sentenced. The specific challenge there was to assess the risk of reoffending and rate prisoners of different racial groups fairly, whilst also ensuring that the risk assessments assigned to individual prisoners are accurate. And some research has focused on this and they claim to have proven mathematically that it is impossible to satisfy both of these goals at the same time.

For us to ensure that technological innovation reflects the kind of society that we want, we first need to decide what we want society to look like, and then have technology reflect that. And we've not done that first piece yet. Which makes it something of a problem to really define, ideally, what we want the technology to achieve, because we haven't defined quite what we want society to be yet. And I'll take a much more simple example that doesn't really get to troubling the dynamics of society. But take a simple example, which illustrates the problems of migrating traditional approaches to things into a technological environment.

If you consider a legal document of 20 pages and there's a last page on that which is a signature page, you could sign that signature page. And quite often these documents are loose leaf, there's nothing to associate that signed page with the first 20 pages. Now, that is an incredibly insecure way of certifying a legal document, it would never be allowed in a technological system. So you have this problem of fixing some of the challenges which we've just accepted as part of day-to-day life when you decide to render something as a system. And that is one of the significant challenges which underlies this consideration that we need to regulate technology to ensure it's consistent with what we want to achieve with society.

JC: Jim, how can people find you in Barcelona if they want to have a chat?

JM: Well, probably the best way is to is to send through an email. I'm available on email, and happy to meet with anyone who might be there. Reach out to **enquiries@transformainsights.com** which will come to me and Matt Hatton, my co-founder. ▶

Jeremy Cowan
IoT Now

For us to ensure that technological innovation reflects the kind of society that we want, we first need to decide what we want society to look like, and then have technology reflect that
- Jim Morrish

Cowan to hand the mic to Morrish

JC: There's also a much less important thing to discuss today. After 27 years covering the communications sector I'm retiring this year, which has implications for you, Jim. Following a decade or more reporting on shipping and transport, healthcare and parenting, then defence and manufacturing, I found myself managing a talented team of telecoms journalists producing 13 magazines, including Mobile Europe and Communications News.

The communications sector is unlike any industry I've worked in before. So, when the opportunity arose to launch a telecoms software magazine of my own in 1999, *VanillaPlus,* I grabbed it. And 24 years later, thanks to the energy and creativity of my past and present co-directors like Nathalie Millar, Cherisse Jameson, and Charlie Bisnar, it's still growing.

We've added other successful communications brands like *IoT Now, IoT Global Network*, and most recently, *The Evolving Enterprise*, which covers artificial intelligence and a lot more besides. So, now seems a good time for me to step back and let a new generation show what they can do. And I am delighted that Jim Morrish here, along with support from his TI co-founder, the excellent Matt Hatton, will be taking over as webinar moderators and podcast hosts on this site. Jim, what changes to these IoT and communications pods and webinars can we expect to see under your guidance?

JM: Thank you, Jeremy. Firstly, it's an honour and a privilege to be to be invited to take this over. You've established many brands, and clearly there's a significant following to these podcasts, webinars, and so on. In terms of what happens next, things will continue in much the same way. My philosophy is not to change something that seems to be working well. So, I think it's going to be more of the same, discussions with various industry luminaries to focus on impactful technologies or new announcements or new propositions. And trying to identify those real-world impacts of technology and tangible benefits and the real challenges, and filter out some of that noise.

JC: Because there is a lot of noise in this industry and filtering it out is what editors are there to do. Social media doesn't do that. It just allows everyone to shout louder. So, we'll be relying on your good sense and experience.

JM: Absolutely, I think there is a key role to play in filtering and highlighting the bits of a message that actually do matter and just, as you say, cutting through that noise. But also, some of the softer things we were discussing; the impact of human society, and the way we live our lives, taking a little time to focus on that, and how technology fits into that and enables that.

But on a slightly different topic, as the baton hands to me, my first question, Jeremy would be, what are you planning to do with your retirement?

JC: It's kind of you to ask. I wrote a novel a few years ago called *The Tin Soldiers*, about conflict minerals and telecoms' role in modern slavery. And I enjoyed it so much, not just the writing but the research, that I plan to do that again. I have a couple of works on the go, plus a historical novel that I want to do. It'll keep me busy. So, yeah, watch out for something by JJ Cowan.

JM: Absolutely, we'll invite you back to talk about that.

JC: Thank you, Jim. I know you and Matt will bring an enviable depth of analysis and experience to this, as well as some very interesting contacts. I can't think of safer hands.

Why mobile operators should consider a mindset shift to leverage the potential of eSIM-only iPhones

Since the announcement that iPhones in the USA will be eSIM-only, there has been a lot of buzz around eSIM technology. This move has marked a significant shift in the way services are delivered to consumers and has opened up opportunities for enterprise IoT. From wearables to health trackers and other edge use cases, mobile operators are increasingly able to provide their networks through embedded SIMs (eSIMs), rather than the traditional plastic SIM cards.

As the trend of downloading electronic profiles gains momentum, it will leave the legacy method of relying on roaming agreements in the dust, making local connectivity the new standard

According to Juniper Research, eSIM-powered devices reached 1.2 billion in 2021 and are expected to surge by 180% in the next four years, with a projected 3.4 billion devices by 2025. While two-thirds of mobile operators offered eSIM services as of January 2021, the industry's shift towards eSIM has been slower than anticipated. As 90% of mobile operators are expected to offer eSIM services by 2025, those that adopt this technology early may gain a competitive edge.

How eSIM-only phones impact the consumer market?

The growth of eSIM-only poses a significant threat to mobile operators, and it's easy to see why. With the convenience of downloading new profiles, it will be much easier for consumers to switch between operators at their leisure. This means that when travelling, consumers will no longer need to rely on expensive and limiting roaming packages from their home operator. Instead, they can simply download local connectivity for better performance and lower costs.

As the trend of downloading electronic profiles gains momentum, it will leave the legacy method of relying on roaming agreements in the dust, making local connectivity the new standard. This will lead to a decrease in revenue associated with roaming and the loss of the stickiness of plastic SIM cards.

To stay competitive, mobile operators will need to think of new ways to retain customers, such as providing exceptional service and support. They will also need to develop new revenue models, with local connectivity being a potential option. The first operators to embrace this shift will gain the most coverage, while those who lag behind risk being left in the dust.

The inevitable demise of roaming and its impact on IoT

As travellers move away from traditional roaming in favour of downloading local profiles at a fraction of the cost, operators need to prepare for a significant loss of revenue. While roaming may work well for consumers looking to travel, it has never been an ideal solution for IoT. The IoT agreements were designed with consumer travel in mind, but there are unique challenges that arise for IoT use cases, such as permanent roaming restrictions and data privacy regulations that must be met for compliance. Furthermore, roaming presents ongoing security concerns and makes it nearly impossible to achieve the low latency and performance necessary for many IoT use cases.

It is time to accept that roaming was never the right choice for IoT, and operators must adapt accordingly. As we enter the era of localised connectivity for IoT, the ability to download, manipulate, and consume local profiles has become easier than ever before.

It's an exciting time for IoT, but operators must be prepared to navigate this shift in connectivity to remain competitive.

Local connectivity meets global needs

Instead of an impending threat, I see a promising opportunity for operators on the horizon. So ask yourself, what do your customers really want? They don't necessarily care about the underlying technology, they just want reliable connectivity that is available whenever and wherever they need it. That's why we're already seeing major operators like AT&T and T-Mobile making significant investments in eSIM technology to take advantage of its potential. ▶

The future of IoT connectivity is all about global availability, but in a localized way

Nir Shalom
CEO
floLIVE

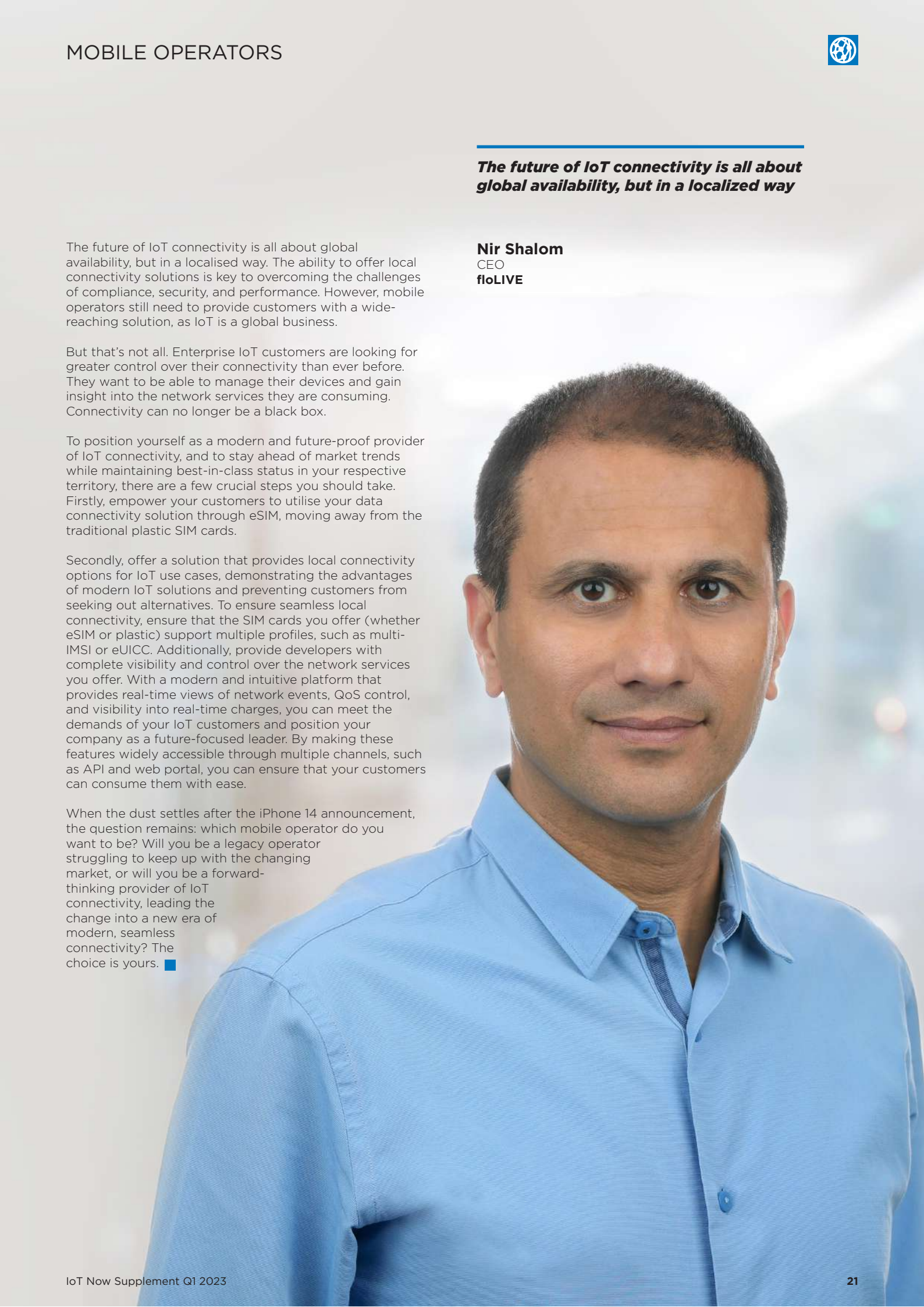
The future of IoT connectivity is all about global availability, but in a localised way. The ability to offer local connectivity solutions is key to overcoming the challenges of compliance, security, and performance. However, mobile operators still need to provide customers with a wide-reaching solution, as IoT is a global business.

But that's not all. Enterprise IoT customers are looking for greater control over their connectivity than ever before. They want to be able to manage their devices and gain insight into the network services they are consuming. Connectivity can no longer be a black box.

To position yourself as a modern and future-proof provider of IoT connectivity, and to stay ahead of market trends while maintaining best-in-class status in your respective territory, there are a few crucial steps you should take. Firstly, empower your customers to utilise your data connectivity solution through eSIM, moving away from the traditional plastic SIM cards.

Secondly, offer a solution that provides local connectivity options for IoT use cases, demonstrating the advantages of modern IoT solutions and preventing customers from seeking out alternatives. To ensure seamless local connectivity, ensure that the SIM cards you offer (whether eSIM or plastic) support multiple profiles, such as multi-IMSI or eUICC. Additionally, provide developers with complete visibility and control over the network services you offer. With a modern and intuitive platform that provides real-time views of network events, QoS control, and visibility into real-time charges, you can meet the demands of your IoT customers and position your company as a future-focused leader. By making these features widely accessible through multiple channels, such as API and web portal, you can ensure that your customers can consume them with ease.

When the dust settles after the iPhone 14 announcement, the question remains: which mobile operator do you want to be? Will you be a legacy operator struggling to keep up with the changing market, or will you be a forward-thinking provider of IoT connectivity, leading the change into a new era of modern, seamless connectivity? The choice is yours. ■



While we have made every effort to ensure the accuracy of this listing, the pandemic means that many events are changing timing, dates and locations. Therefore please check at the events' websites to ensure details are up-to-date before travelling.

MWC Barcelona 2023
27 February – 2 March 2023
Barcelona, Spain
www.mwcbarcelona.com

Embedded World 2023
14-16 March 2023
Nürnberg, Germany
https://www.iot-now.com/event/embedded-world-2023/

LogiPharma
25-27 April 2023
Lyon, France
https://www.iot-now.com/event/logipharma/

IoT Tech Expo North America
17-18 May 2023
Santa Clara, California, USA
https://www.iot-now.com/event/iot-tech-expo-north-america-2/

The Things Conference 2023 Amsterdam
21-22 September 2023
Amsterdam, The Netherlands
https://www.iot-now.com/event/the-things-conference-2023-amsterdam/

IoT Tech Expo Europe
26-27 September 2023
Amsterdam, The Netherlands
https://www.iot-now.com/event/iot-tech-expo-europe-2/

IoT Tech Expo Global
30 November – 1 December 2023
London, UK
https://www.iot-now.com/event/iot-tech-expo-global-2/

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