

# IoT NOW

HOW TO RUN AN IoT **ENABLED** BUSINESS

## CEO GUIDE TO IoT TECH EXPO 2023

### INTERVIEW

Tata Communications  
welcomes a world  
of ubiquitous multi-  
technology connectivity



**Bosch's Andreas Wolter explains how  
IoT knowledge grows with experience**

**PLUS: IoT Tech Expo 2023 event preview and information** • Why the connected device revolution is unleashing offshore development's full business potential • Renesas to acquire Sequans • Carlsberg turns to Cato Networks for global SASE deployment • Why second mover advantage doesn't make you first of the losers • How Tata Communications MOVE supports elevated customer experience at medical imaging company • Is global IoT connectivity really becoming easy to access? • News, Features and Interviews online at [www.iot-now.com](http://www.iot-now.com)



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**6** INTERVIEW  
Mysore Madhusudhan, Tata Communications



**12** CASE STUDY



**18** FEATURE

Welcome to  
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**IN THIS ISSUE**

**04 EDITOR'S COMMENT**

George Malim on how IoT technologists can gain second mover advantage

**05 INDUSTRY NEWS**

More than 370,000 AGVs to alleviate seaport congestion by 2030 says ABI Research, Renesas to acquire Sequans

**06 CONTRACT NEWS**

Carlsberg selects Cato Networks for global SASE deployment, Ineos Oxide agrees chemical transport tracking deal with Globalstar

**08 INTERVIEW**

Tata Communications' Mysore Madhusudhan explains how efficient services and technologies fuel success for IoT organisations and their customers

**12 CASE STUDY**

How a medical imaging technology service company is using Tata Communications MOVE to support elevated customer experience

**14 IoT CONNECTIVITY**

Robust, secure and easy to access – are we in a new era of IoT connectivity?

**16 EVENT PREVIEW**

Antony Savvas talks to Tata Communications about the key drivers and technologies for the IoT sector

**18 INTERVIEW**

Andreas Wolter explains how knowledge comes with experience as IoT pioneers the journeys of tomorrow

**22 OFFSHORE DEVELOPMENT CENTRES**

Why the connected device revolution is unleashing offshore development's full business potential

**IoT TECH EXPO EUROPE**

**24 EVENT PREVIEW**

Antony Savvas previews IoT Tech Expo Europe

**26 EVENT INFORMATION**

The event organisers share how to pioneer the future of connectivity and innovation at the Amsterdam event

**30 EVENT DIARY**

Our pick of the upcoming events

**TATA COMMUNICATIONS**

**Cover sponsor:** Tata Communications is a digital ecosystem enabler that powers today's fast-growing digital economy. The company enables the digital transformation of enterprises globally, including 300 of the Fortune 500 – unlocking opportunities for businesses by enabling borderless growth, boosting product innovation and customer experience, improving productivity and efficiency, building agility and managing risk. With its solutions orientated approach, proven managed service capabilities and cutting-edge infrastructure, Tata Communications drives the next level of intelligence powered by cloud, mobility, Internet of Things (IoT), collaboration, security and network services. Tata Communications carries around 30% of the world's internet

routes and connects businesses to 80% of the world's cloud giants and four out of five mobile subscribers. The company's capabilities are underpinned by its global network, the world's largest wholly owned subsea fibre backbone and a Tier-1 IP network with connectivity to 190+ countries and territories around the world. Tata Communications Limited is listed on the Bombay Stock Exchange and the National Stock Exchange. Tata Communications has been a part of the rich heritage of the internet in India. Over the last 25 years, enterprise-enabled services have been essential to the adoption of digital services in the country. From utility to transformation, connectivity is an essential fabric of sustenance for the economy. Tata Communications is committed to enabling Industry leaders in this New World of Communications, with our unique promise of delivering secure connected digital experiences.

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EDITORIAL  
ADVISORS

# Second mover advantage doesn't make you first of the losers

IoT Tech Expo 2023 provides an opportunity to assess, discuss and explore the latest advances in IoT technology, providing an important platform to differentiate IoT from technology in general. This is needed because it's easy to take mainstream technologies from artificial intelligence (AI) to digital twins and forget their inherent enabling capabilities for IoT

The realities – mixed, augmented and virtual – coupled with AI, predictive analytics, data processing and machine learning are all part of a massive technological ecosystem that traverses verticals and horizontal. It's therefore important that platforms like the Expo exist in order for our piece of industry – IoT – to learn what impacts these technologies might have on IoT-enabled businesses. This isn't really possible in a wide-focus all-embracing tech event, which talks in broad-brush strokes about a radically changed future vision.

The other aspect that makes it so important to have an IoT-specific tech event is that IoT organisations are early adopters of technologies. Would these technologies be gaining so much traction without IoT innovations? Probably not, because enterprises would still be following traditional business practices and supporting that with IT that has been made more efficient by cloud and edge computing but lacks a reason to proceed that IoT delivers by the spade-full.

Being able to learn about the confluence of one or more enabling technologies with the IoT ecosystem at a dedicated event is a chance to specialise in

technologies that support IoT's horizontal of specialists. It might have become unfashionable to seek out an expert and then act on their advice but, for early adopters, it's the only way to avoid the bleeding edge of innovation and reap the rewards of being quick to assimilate future technologies into your roadmap.

When it comes to adopting new technologies, the enthusiasts often get there first but it's the serious businesses that arrive shortly after who gain second mover advantage. For IoT companies, this is the goal: to get to new innovations at the point at which they are mature enough to integrate into each vertical ecosystem and deliver real value to end customers and to do so just in front of your competitors.

Enjoy the Expo and this Guide!

George Malim



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AGVs set to reduce crowding in seaports

## Seaports to deploy over 370,000 AGVs by 2030 to alleviate congestion, says ABI

The maritime industry has increased its automation efforts in the wake of global seaport congestion. In addition to solutions such as gantries, automated port gates and stacking cranes, autonomous horizontal transport modes such as automated guided vehicles (AGVs) that transport containers and loads to and from ships have been the most productivity-augmenting solutions in seaports.

AGV seaport deployments worldwide will have a compound annual growth rate (CAGR) of over 26% from 2022 to 2030 and exceed 370,000 global deployments by 2027," said Adhish Luitel, the supply chain management and logistics senior analyst at **ABI Research**. "Automation improves port operations' reliability, consistency, and workplace security. Also, from an environmental perspective, automation can lead to efficient operations and faster services. Automated ports are also far safer than

conventional ports. The number of human-related disruptions falls as performance becomes more predictable with automation and data capture solutions."

In addition to AGVs in seaports, adopting solutions in other modalities of the global supply chain, such as rail, air and road, has also seen growth. Automation solution providers have provided various automation and digital tools that enhance operational efficiency and visibility across different modalities. Rail camera systems in rail infrastructure are a particularly growing sector. Over 29,000 inspection robots were deployed in rail infrastructure globally in 2022. This number is set to grow to over 43,000 by 2030 with a CAGR of around 5%, falling in line with the rising rail freight volume. Over 14 billion tons were transported in 2022 via rail freight. This number is set to grow to over 16 billion by 2030. ■

## Renesas to acquire Sequans through tender offer

**Renesas Electronics**, a supplier of semiconductor solutions, and **Sequans Communications** have entered into a memorandum of understanding (MoU) for the sale of Sequans to Renesas. Pursuant to the terms of the MoU, Renesas will, following consultation of the Sequans' works council and favourable recommendation by Sequans Board, commence a tender offer to acquire all outstanding ordinary shares, including American Depositary Shares (ADS) of Sequans for US\$3.03 per ADS (each ADS representing four ordinary shares) in cash. The transaction values Sequans at approximately US\$249 million, including net debt, and is expected to close by the first quarter of calendar year 2024, subject to confirmation of tax treatment from relevant authorities, regulatory approvals and other customary closing conditions.

Upon closing of the transaction, Renesas intends to integrate Sequans' cellular

connectivity products and IP into its core product line-up, including microcontrollers, microprocessors, analogue and mixed signal front ends. The acquisition will allow Renesas to expand its reach to the wide area network (WAN) market space encompassing a broad range of data rates. It will also enhance Renesas' already rich portfolio of personal area network (PAN) and local area network (LAN) connectivity products.

"We are thrilled to take our partnership with Sequans to the next level," said Hidetoshi Shibata, the president and CEO of Renesas. "Sequans is a leader in the fast-growing cellular IoT market with wide cellular IoT network coverage. The company's technology gives Renesas a path to offer broad connectivity capabilities across IoT applications to address the evolving customer needs." ■

## News in Brief

### Momentum provides hosted payload services for FOSSA

**Momentum** has signed a contract with **FOSSA Systems**, which offers global low-power internet of things (IoT) connectivity and in-space services, to provide hosted payload services starting in 2024. The hosted payloads will complement FOSSA's existing IoT satellite constellation with additional capacity and serve as a technology demonstrator platform independent of future satellite launches FOSSA has scheduled for 2024 and 2025.

"Adding to our satellite platforms, we look to expand our way of hosting communications payloads by using on existing launch opportunities, namely the Vigoride," said Julian Fernandez, the chief executive of FOSSA Systems. "We look forward to collaborating once again with Momentum." ■

### Soracom launches IoT connectivity plan for Brazil

**Soracom** has announced its release of PlanP2, a new data plan. The plan delivers IoT connectivity for Brazil using a local carrier profile to ensure regulatory compliance. Brazil is a growing market for IoT, but regional restrictions on permanent roaming present a compliance challenge for connected devices designed to be used in multiple countries. With PlanP2, customers can use the same Soracom IoT SIM for both global multicarrier connectivity in more than 160 countries and 2G/3G/4G/NB-IoT connections in Brazil.

"Success in IoT depends on a connection you can count on," said Kenta Yasukawa, the chief technology officer and co-founder of Soracom. "Where a local profile is needed, we're committed to making it easy with a single IoT SIM and on-demand access to the right plan over the air. PlanP2 positions our customers to deliver leading-edge connected experiences in one of the world's most dynamic IoT markets." ■



## News in Brief

### US Air Force selects Actelis for IoT networking

**Actelis Networks** has been selected by the **United States Air Force** to modernise on-base networking. The company's hybrid fibre-copper networking solutions will extend connectivity to 41 sites within the base, enabling data services as well as monitoring and control for mission critical systems.

"Our solutions continue to be a perfect match for military bases looking to instantly and securely update their networks, in a highly cost-effective manner," said Tuvia Barlev, the chairman and CEO of Actelis. "The system we will deploy for the Air Force is in addition to other bases we helped modernise with Air Force, Army and Navy, and can be easily replicated for more bases nationwide and across the world, currently in various stages of evaluation and implementation." ■

### Chery automotive deploys ForwardX AMRs

**Chery** Super Factory, a global automobile manufacturing plant, has partnered with **ForwardX Robotics**, a provider of autonomous mobile robots (AMRs), to implement a smart automotive manufacturing solution. The collaboration aims to streamline operations, improve efficiency and enhance automation in the assembly workshop of the factory.

Chery has adopted vision-based AMRs for automated material movement in the assembly workshop. In the first stage of deployment, more than 100 AMRs have been integrated with the factory's logistics execution systems (LES) software to enable unmanned material movement across various assembly lines. ■

### Carlsberg selects Cato Networks for global SASE deployment

**Cato Networks** has announced **Carlsberg Group** as its latest enterprise customer for massive global secure access service edge (SASE) deployment. The brewer will now be able to address IT challenges at scale, improve application delivery, modernise security capabilities, and standardise IT service delivery across over 200 locations, covering more than 25,000 global remote users. Instead of security appliances, Carlsberg will rely on Cato's cloud-native security capabilities.

"We were looking to move from several regional service providers with fragmented technical solutions to one

integrated network and security stack with an end-to-end managed service," said Laurent Gaertner, the global director of networks at Carlsberg Group. "The Cato SASE cloud and service offering perfectly matched our requirements."

Shlomo Kramer, the co-founder and chief executive of Cato Networks, added: "Cato was explicitly built to help companies of all sizes meet those needs. We're excited to work with Carlsberg and see their adoption of Cato as just the latest evidence that large enterprises can best meet today's security and networking challenges with a single-vendor SASE cloud platform." ■



Adopting SASE gives Carlsberg something to celebrate

### Ineos Oxide secures chemical transportation with Globalstar

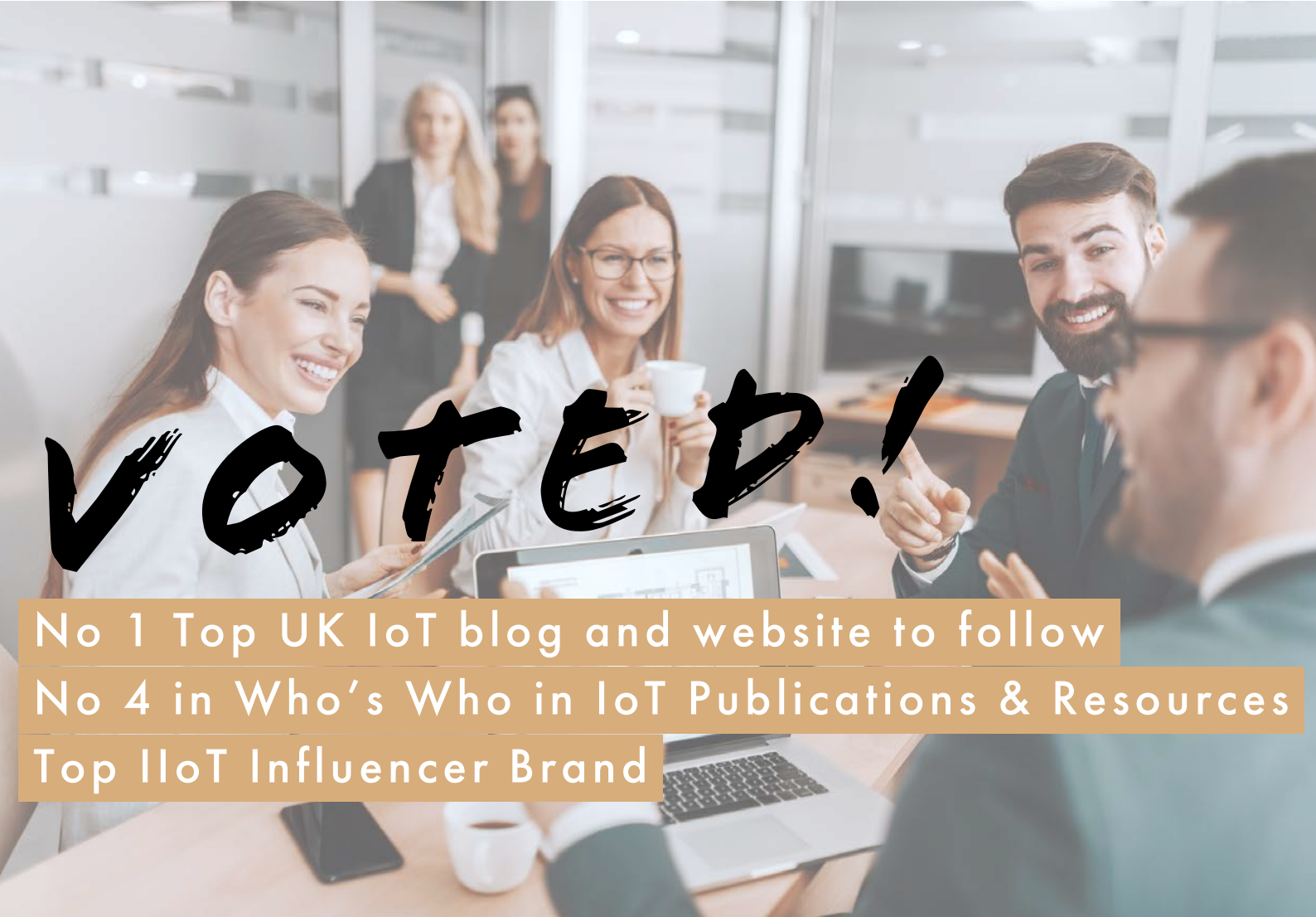
**Globalstar** has announced that global petrochemicals provider **INEOS Oxide** is deploying its Ovinto Sat tracking solution. This will monitor and safeguard rail and road transport of explosive gases across mainland Europe. Following the staged introduction of the system over several years, INEOS Oxide has expanded deployment and now installs Ovinto Sat sensors across its entire fleet of tank containers and rail cars, a total of approximately 700 devices to date.

Two of the main products which INEOS Oxide transports are ethylene oxide and propylene oxide, primarily used to manufacture products for the following industries and applications: agrichemicals, construction, pharmaceuticals and personal care, solvents and inks, surfactants and detergents. Both chemicals are highly explosive, flammable and carcinogenic to humans and animals.

Ovinto Sat enables INEOS Oxide to know the exact location and status of every tank and rail car, continuously and in real-time, even when beyond the reach of cellular networks. This regular, dataflow empowers INEOS Oxide and its supply chain partners to make speedy, well-informed business decisions about each delivery and be alerted to any changes in container/car environmental conditions that might affect the shipment.

"We are extremely pleased with the performance of Ovinto Sat," said Patrick De Block, the business safety, health and environmental (SHE) manager at INEOS. "Ovinto Sat's innovative and powerful tracking platform helps our business in so many ways, the most important of which is ensuring the safe conveyance of our products." ■

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# Efficient services and technologies fuel success for IoT organisations and their customers

As executive vice president for Collaboration and Connected Solutions at Tata Communications, Mysore Madhusudhan is responsible for enabling digital employee and customer experiences for enterprises globally by using the new and emerging technologies of unified communications and collaboration, IoT, mobility and 5G. A digital strategist and transformation leader, Madhusudhan has led the rollout and operations of GSM, CDMA, NGN and complex MPLS networks for enterprises across the globe during his career spanning over 30 years. Here, he tells IoT Now how he sees recent connectivity innovations coming together to fuel massive scale IoT for enterprises

***Mechanisms already exist to enable devices to dynamically switch between different networks based on their location and requirements***

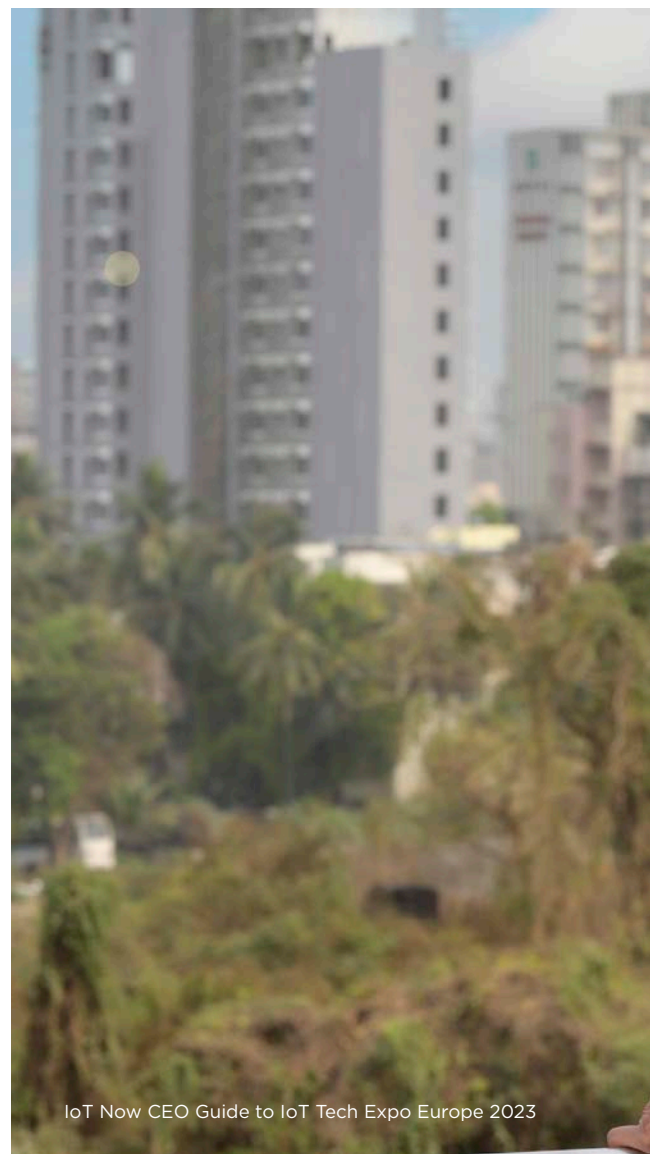
**IoT Now:** How do you see the coming together of public and private wireless networks and cellular, low power wide area (LPWA) and Wi-Fi technologies creating a seamless, ubiquitous connectivity fabric for IoT? Is it realistic that connections can interoperate smoothly to support IoT devices and applications?

**Mysore Madhusudhan:** We believe the convergence of these technologies marks a significant step towards establishing a vision for seamless connectivity, not just for industrial IoT but for a range of connected consumer devices and consumer services.

One of the key advantages is the expansion of coverage it offers. Cellular networks, with their extensive reach, are adept at providing connectivity in urban, suburban and remote areas. LPWA technologies like narrowband IoT (NB-IoT) and LoRa-WAN excel in connecting low-power devices over medium and long distances, making them suitable for applications such as smart agriculture and industrial monitoring. New Wi-Fi releases provide high-speed data transmission, but work in localised environments. By integrating these technologies, a hybrid network capitalises on the strengths of each technology.

Mechanisms already exist to enable devices to dynamically switch between different networks based on their location and requirements. For instance, a mobile asset might use cellular connectivity while in transit and automatically switch to Wi-Fi when it's within a Wi-Fi-enabled ►

## SPONSORED CASE STUDY





location. This dynamic network switching ensures uninterrupted connectivity and optimal performance.

In scenarios where a single network technology might face coverage issues or congestion, having multiple options allows devices to maintain their connection through an alternative network. This is particularly crucial for IoT applications that demand real-time data transmission, including remote healthcare monitoring or critical infrastructure management.

**IoT Now: Massive IoT means vast volumes of connected devices are added to networks. This hugely increases the threat surface businesses and consumers need to protect, especially as edge computing increasingly demands networked solutions. How will cybercriminals be thwarted and which organisations will be central to enabling IoT security?**

**MM:** One of the key strategies to thwart cybercriminals in the realm of IoT is the

implementation of strong authentication and encryption mechanisms. Devices must be equipped with secure identity management systems, ensuring that only authorised entities can access and communicate with them. Robust encryption protocols safeguard data in transit and at rest, making it extremely challenging for malicious actors to intercept or tamper with sensitive information.

Network segmentation and isolation are crucial techniques to limit the potential impact of a security breach. By creating separate zones within an IoT network, even if one section is compromised, the damage can be contained, preventing lateral movement of threats.

Behavioural analysis and anomaly detection play an integral role in identifying suspicious activities within the IoT ecosystem. The adoption of machine learning and AI will increasingly play a role in recognising deviations from normal patterns, enabling swift response to potential threats. ►

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***Network segmentation and isolation are crucial techniques to limit the potential impact of a security breach***



**Mysore Madhusudhan**  
Tata Communications



## **Organisations can offer enhanced services to customers based on the intelligence that is unlocked by IoT data**

As for the organisations central to enabling IoT security, a collaborative effort is required. IoT device manufacturers need to prioritise security by design, building devices with inherent security features and ensuring timely security updates throughout the device lifecycle. Network service providers must ensure that communications channels are secure, while offering services like intrusion detection and threat detection. In this context government and regulatory bodies also play their part by establishing standards and guidelines for IoT security. Specialist cyber security companies that develop tools and technologies to safeguard IoT ecosystems also play their part, with services like threat intelligence, vulnerability assessment, and incident response.

**IoT Now: Data analytics relies on the connectivity behind IoT to enable new use cases, rich insights and the new revenue streams and capabilities of IoT. How will IoT organisations harness far more granular data to empower their decision making and create value from their data?**

**MM:** IoT enabled organisations can harness more granular data by adopting advanced analytics techniques. Machine learning and artificial intelligence (AI) algorithms now process vast datasets to identify patterns, anomalies and correlations that human analysis might miss. This empowers decision-makers with predictive and prescriptive insights.

Organisations can offer enhanced services to customers based on the intelligence that is unlocked by IoT data. In a world of finite resources, we are already witnessing the data-driven optimisation of supply chains and operations to reduce costs and minimise waste.

To harness granular data effectively, organisations need robust data management strategies. This involves collecting, storing, and processing data efficiently while ensuring data security and compliance with local regulations. While edge computing has primarily focused on processing data while minimising latency, it also ensures more timely insights for organisations to respond to.

Partnerships and collaborations are pivotal in maximising the value of IoT data analytics. Cross-industry collaborations can merge datasets from various sources, generating insights that were previously siloed. Collaborating with technology companies and analytics experts can also provide access to cutting-edge tools and methodologies.

**IoT Now: To what extent have advances in AI and automation made all of the above – the connectivity, security and data analytics – improve their performance to the benefit of IoT? Is it fair to say that IoT is now far better supported and able to execute more effectively on its aspirations thanks to these technologies?**

**MM:** There are a number of points to consider:

**Connectivity:** AI-powered algorithms are revolutionising how IoT-enabled devices communicate and connect. For example, machine learning algorithms can optimise network routing, enabling devices to find the most efficient path for data transmission. This reduces latency, enhances reliability, and ensures seamless connectivity even in challenging environments. AI-driven predictive analytics helps to anticipate network congestion and proactively adjust data flows, maintaining consistent connectivity and QoS for IoT devices.

**Security:** AI is proving to be a powerful tool in bolstering IoT security. AI algorithms can continuously monitor network traffic, identifying anomalies and potential threats in real-time. This proactive approach enables swift responses to security breaches, minimising the impact of attacks. AI-based authentication mechanisms provide robust protection against unauthorised network access, ensuring that only legitimate devices and users can access IoT networks.

**Analytics:** AI and automation are transforming data analytics for IoT ecosystems. Machine learning algorithms can process vast volumes of data generated by IoT devices, uncovering hidden patterns, correlations, and insights. This enables data-driven decisions, predictions about future trends, and identification of enhanced process



efficiency. AI-driven analytics also enable real-time data processing at the network edge, minimising the need to transmit large amounts of data to centralised servers, for better real-time analysis and response.

**Operational efficiency:** AI-driven automation can orchestrate complex workflows, optimise resource allocation, and streamline operations. This is particularly crucial in large-scale IoT deployments where manual management is unrealistic. Automation ensures that devices are maintained, updated, and patched without human intervention, enhancing overall system efficiency and reliability.

**Responsiveness:** The combination of AI, automation, and IoT enables real-time responsiveness that was previously unattainable. AI algorithms analyse incoming data streams, make split-second decisions, and trigger actions autonomously. This capability is invaluable in scenarios such as using autonomous vehicles, industrial automation, or smart city applications, where swift responses to changing conditions are critical.

**IoT Now: What is Tata Communications' role here? You have the heritage of providing secure, resilient networking globally but what does this mean for the secure, data-driven future of not only IoT but society in general?**

**MM:** In the sphere of connected things in general Tata Communications provides a unique combination of technologies, services and infrastructure. Our connectivity management platforms ensure the most efficient way to manage multi-channel connectivity, on a local or international basis. Our application enablement capabilities provide an interface for connectivity integration via application programme interface (API) connectors. Our data management services provide integrated views of multiple data streams, supported by analytics and decision support tools.

In terms of connectivity and infrastructure, we not only support our customers with a comprehensive range of options, including public and private cellular connectivity, LoRa-WAN and managed Wi-Fi services, but we also provide the ability to blend these capabilities, ensuring our customers can benefit from the optimum combination of connectivity technology. A combination of our global IP backbone and IPX infrastructure ensures that we can move IoT data around the world and break it out securely and efficiently to the cloud, via our secure cloud connectivity services.

Our relentless focus on security takes a multi-dimensional approach, with encrypted data transmission, VPN services and secure IPX infrastructure, complemented by dedicated business units, including 'NetFoundry' for zero trust and App-WAN services, along with our award winning mobile secure access service edge security, ensuring that potentially compromised devices can be identified and isolated from the rest of the network.

Our ability to support our customers and partners on a local and global basis, means that they can be confident in launching IoT-enabled projects across a range of segments and in multiple countries. We are working with customers across automotive, industrial, aviation, healthcare, smart cities, public utilities, logistics and related sectors, deploying a range of technologies and services to ensure the most efficient solutions are deployed and managed for the benefit of our customers and ultimately for the benefit of the customers of our customers. ■

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***In the sphere of connected things in general Tata Communications provides a unique combination of technologies, services and infrastructure***



# How Tata Communications MOVE supports elevated customer experience at a medical technology service company

The customer is a large European engineering and manufacturing conglomerate with a medical equipment business that is a market leader in providing medical imaging and diagnostic systems to hospitals and clinics. The equipment is connected to a service centre in Europe, taking information feeds from equipment located around the world. The business not only provides the equipment but also provides the diagnoses as well, as part of a comprehensive service package for hospitals

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***The Tata Communications MOVE platform has enabled a seamless global roll-out of end-to-end 4G connectivity, that does not require complex management***

The company was previously using best effort device internet connectivity provided by the local clinics and hospitals in which each item of equipment was installed. This was inefficient, primarily due to security concerns and control over connections. The company wanted to reduce complexity by partnering with a single, specialised provider who could deliver connectivity for its equipment in any country in the most efficient way possible.

Using **Tata Communications MOVE** has enabled end-to-end connectivity for all the ultrasound machines and computed tomography scanners, currently operating across 48 countries.

Taking a multi-network coverage approach and the application of local SIM profiles, Tata Communications MOVE ensures wide coverage availability along with adherence to local regulations regarding permanent roaming. The unique and comprehensive eSIM interoperability hub solution ensures that local SIM profiles can be pushed to each item of equipment, depending on which country it is being operated in. Orchestration via a business rules engine enables the flow of data from each item of equipment, back to the manufacturer's centralised application service centre. This is also managed across Tata Communications core backbone network, connected via local packet gateways, ensuring secure and private data transmission in the most efficient way possible. ►

## SPONSORED CASE STUDY



### The Result

At present using 4G - and evolving to 5G - cellular connections enables the equipment manufacturer to provide elevated services to the hospitals and clinics which it serves, by always keeping its equipment and systems running and available for patients. The manufacturer can deploy remote monitoring and support services, as well as over the air (OTA) software updates across all its existing and future markets.

The flexibility, agility and scalability delivered by the Tata Communications MOVE global mobility platform can accommodate any future use cases, ensuring a long term future for the business.

“The Tata Communications MOVE platform has enabled a seamless global roll-out of end-to-end 4G connectivity, that does not require complex management,” commented an executive from the medical technology service company. “Inconsistent connectivity is removed, allowing us to focus on our customer service and ensuring patients receive the best possible attention.” ■

### Deployment highlights

- Global 4G connectivity with an upgrade path to 5G non-standalone (NSA) and 5G-SA in future
- Enabling remote monitoring and over-the-air upgrades
- Deployed in 48 countries worldwide
- Secure data transmission via local packet gateways, across Tata Communications' own IP backbone to efficiently breakout data to applications in the cloud

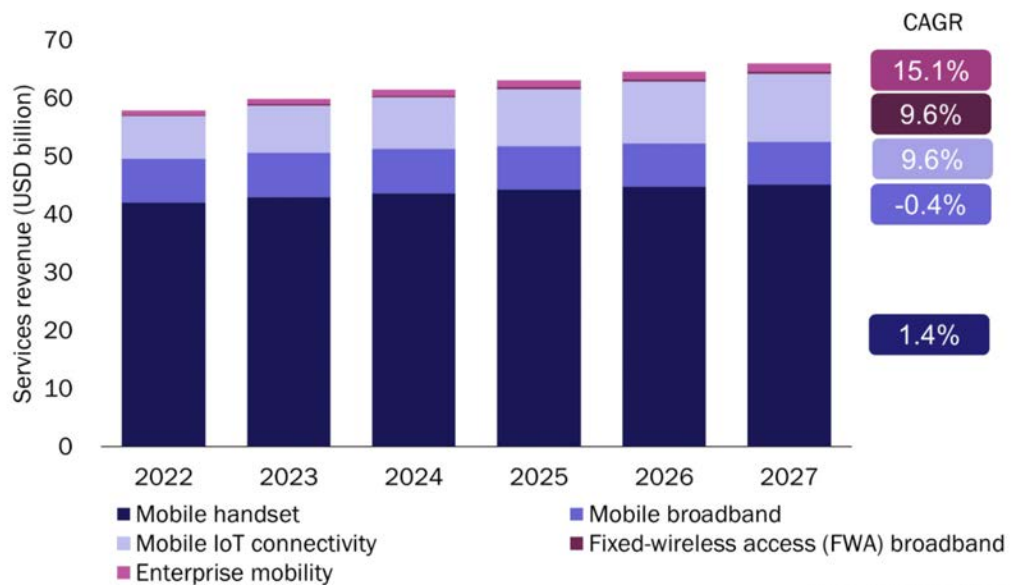
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# Global IoT connectivity is now robust, secure and easy to access

One of the most significant barriers to IoT adoption has been the complicated and multi-layered process of ensuring connectivity is available for devices. Even for single country deployments, multiple connection options are required to assure optimal performance and these have been complex to manage, suffer from inflexibility and have been delivered in ways that the market doesn't want. Global connectivity for IoT has now matured into its own category and service providers are starting to reap rewards

**Figure 1: Operators' public network mobile services revenue from enterprises (250+ employees), worldwide, 2022-2027**



Source: Analysys Mason

**The growth in enterprise IoT connections forms part of a growth pattern for cellular IoT in general, which is still waiting for hyper-scale growth**

Analyst firm **Analysys Mason** has reported that IoT connectivity will account for almost 20% of telecoms operators' mobile services revenue from enterprises by 2027. Traditionally the cash cow of the operator world, enterprise revenues are one of the last remaining jewels in the crown for operators so, to be poised to see one-fifth of this switch to IoT is a watershed moment.

This doesn't mean that IoT connectivity has become significant in every market. In fact, the firm warns that for the mobile market as a whole, IoT is now expected to account for less than 2% of operators' mobile revenue in 2027. However, in the enterprise market the story is different. IoT connectivity is expected to account for more than half of operators' incremental revenue from enterprise public network mobile services over the next five years.

In absolute terms, IoT connectivity services for enterprises will account for US\$4.3 billion in revenue growth for operators between 2022 and 2027, more than half of the total increase of US\$8.1 billion in operators' public network mobile services

revenue from enterprises (excluding private networks) detailed in **Figure 1**. Mobile handset services will contribute a further US\$3.1 billion in revenue growth, though some of this will be substitutionary revenue from mobile broadband services which will decline in response to the increasing use of handset data and mobile tethering.

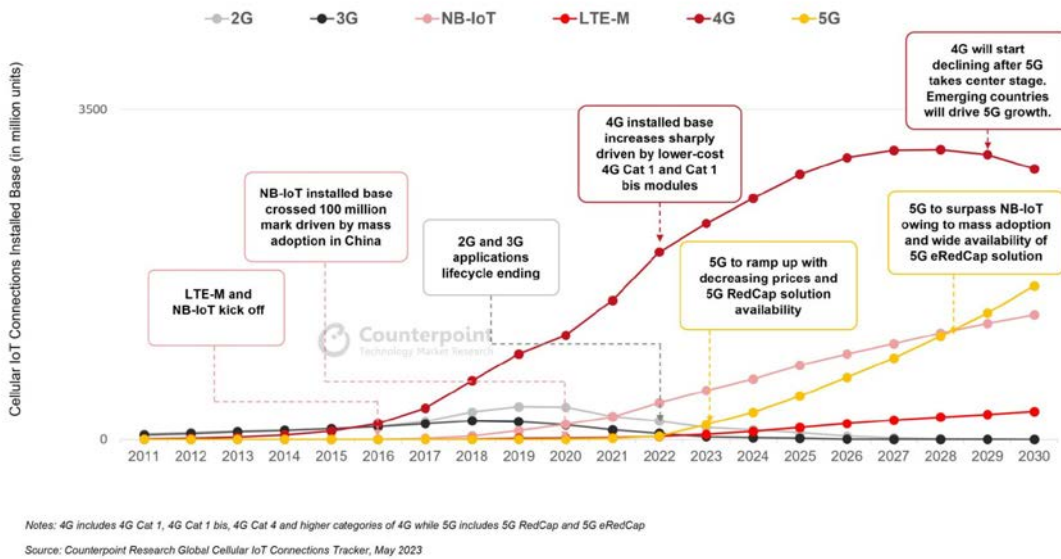
The growth in enterprise IoT connections forms part of a growth pattern for cellular IoT in general, which is still waiting for hyper-scale growth.

**Counterpoint Research** reports that global cellular IoT connections grew strongly at 29% year-on-year to reach 2.7 billion in 2022, according to the firm's latest Global Cellular IoT Connections Tracker report. They are expected to grow at a CAGR of 10.8% to reach an installed base of over six billion by 2030. China held more than two-thirds of total cellular IoT connections in 2022, followed by Europe and North America.

Commenting on the cellular IoT connectivity technology dynamics, senior research analyst Soumen Mandal said: "At the end of 2022, 4G and ▶



Figure 2: Cellular IoT connections installed base



narrowband-IoT (NB-IoT) together accounted for nearly 90% of the installed base of cellular IoT connections. 4G emerged as the most preferred technology for cellular IoT connections after surpassing 2G and 3G-based IoT connections in 2016. NB-IoT has gained significant popularity in China, while Japan, Australia and North America prefer LTE-M technology for lower-end applications. Europe has adopted a combination of NB-IoT and LTE-M, supported by roaming services offered by most operators.”

In recent times, 4G Cat 1 bis technology has gained significant popularity over NB-IoT due to its superior performance. Applications such as POS, telematics and smart meters are increasingly adopting this technology on a larger scale. The rising shipments of devices based on 4G Cat 1 and 4G Cat 1 bis technologies are contributing to the stagnant market growth of NB-IoT.

Counterpoint reports that 5G is still nascent, see **Figure 2**, but it expects 5G-based applications to pick up as the module average selling price (ASP) drops to sub-US\$100 and more 5G RedCap-based solutions become available in the market. The introduction of 5G RedCap and 5G eRedCap will play a crucial role in driving mass adoption of 5G, particularly in developing and underdeveloped countries.”

Of course, for robust, connectivity, cellular cannot be the only option because of incomplete coverage and the need for failover options in the event of downtime. In those cases, the IoT sector is increasingly turning to satellite connectivity and the decreasing costs of satellite launches and lower capital outlays have enabled several new small satellite (SmallSat) operators (such as **Swarm Technologies, Kepler, FOSSA Systems, Sateliot, Lacuna Space, HEAD Aerospace Group and Totum Labs**) to enter the satellite Internet-of-

Things (IoT) market with low-cost and low-power satellite connectivity offerings, reports **ABI Research**.

These new entities seek to challenge traditional satellite IoT incumbents, including **Inmarsat, Iridium, ORBCOMM** and **Globalstar**, to provide a more cost-effective solution for end customers. According to the firm, total satellite IoT connections will increase from 10.4 million in 2022 to 27.0 million in 2030 (at a CAGR of 12.7%), with satellite IoT connection revenue growing from US\$2.2 billion to US\$7.8 billion in the same period (at a CAGR of 16.6%).

“Reusable rocket technology has driven down the cost of launching satellites into orbit, with prominent players such as **SpaceX** and its Falcon rockets. Increased competition in the space launch services industry from China, for example, is expected to further drive down launch costs,” explains Matthias Foo, an industry analyst at ABI Research. “Beyond that, CubeSat technology has also enabled quick and low-cost deployment of new LEO satellites as they can be built rapidly with standard off-the-shelf components.”

Fleet management and condition-based monitoring (CBM) applications, such as for agriculture, utilities and environmental monitoring use cases, are expected to see high growth rates. Maritime vessels and aircraft frequently move out of the reach of terrestrial cellular networks, while farmlands, utility network pipelines/infrastructure, and environmental monitoring devices are often located in remote areas without reliable terrestrial cellular connectivity. “As such, satellite connectivity is seen as a suitable option to augment existing terrestrial IoT solutions for these use cases,” Foo points out. Some notable partnerships include the agreement between **Shell** and **Hiber** for a satellite-based oil well monitoring solution and **Wyld Networks’** infrastructure monitoring solution provided for a Middle Eastern water utility provider. ■

**In recent times, 4G Cat 1 bis technology has gained significant popularity over NB-IoT due to its superior performance**



# Drivers and solutions for improved IoT connectivity

Tata Communications will be taking part in the forthcoming IoT Tech Expo Europe in Amsterdam. Antony Savvas asked the company what the key drivers and technologies for the industry are

Tata says there are three main areas to consider. First, there is the implementation of multi-technology connectivity for IoT, using a combination of cellular/Wi-Fi, cellular/unlicensed and public/private networks.

## Second in the Tata stack, comes AI-enabled operational analytics

### Multi-technology connectivity

One of the fundamental challenges in IoT is ensuring reliable and efficient connectivity for an ever-expanding range of devices. Multi-technology connectivity offers a versatile approach to address these challenges by combining various communication protocols to meet specific requirements. By using multi-technology connectivity, IoT solutions can optimise their network resources and choose the most suitable communication method for each device, ensuring seamless communication across various environments.

Several technologies play a crucial role here:

1. Public cellular connectivity, such as 4G LTE and 5G, provides ubiquitous coverage and high data rates. It is ideal for applications that require real-time data transmission, such as remote monitoring, connected vehicles and smart city infrastructure.
2. Private cellular networks are a new trend in IoT connectivity. These networks enable organisations to deploy dedicated network

infrastructure within their premises, offering enhanced security, low-latency, and reliable connectivity for critical applications like industrial automation and smart factories.

3. LoRa is a low-power, wide area network (LPWAN) technology that enables long-range communication with minimal power consumption. It is ideal for battery-operated IoT devices deployed in remote or hard-to-reach locations, and used for environmental monitoring and agricultural applications, for instance. It can be used in conjunction with cellular connectivity.
4. Wi-Fi is a widely adopted technology for IoT applications within close proximity to access points. It is commonly used in smart homes, offices, and public spaces where high data rates are required for applications like home automation and smart appliances.

### AI operational analytics

Second in the Tata stack, comes AI-enabled operational analytics. This is the idea of intelligent network switching, whereby an applet on a SIM or eSIM detects changes in network conditions and sends information back to a central AI engine. This then switches information between one network and another, or between one network type and another. ▶

SPONSORED ARTICLE



The vast amount of data generated by IoT devices holds immense potential to drive insights and create value. Data analytics in IoT is the process of extracting meaningful information from this data to make informed decisions and improve overall system performance.

By utilising data analytics in IoT, organisations can unlock the full potential of their connected devices, turning raw data into actionable intelligence that drives innovation and enhances efficiency.

A number of data analytics techniques are prevalent in the IoT domain:

1. **Artificial intelligence:** AI, including machine learning algorithms, enables IoT systems to analyse data, detect patterns, and make predictions without explicit programming. AI-powered IoT applications include predictive maintenance, anomaly detection, and personalised recommendations.
2. **Operational analytics:** these optimise operational processes by analysing real-time data from IoT devices. For example, in smart manufacturing, operational analytics can monitor production lines' performance and identify bottlenecks.
3. **Decision support:** IoT data, when combined with data visualisation and business intelligence tools, provides decision-makers with valuable insights to drive strategic choices. Decision support systems enable stakeholders to understand trends, identify opportunities, and mitigate risks.

**Security**

Security is next up. How do you secure remote devices against hacking and physical tampering? We are now in the era of mobile-secure access service edge and all things to do with edge computing/processing, says Tata. Securing the edge devices is one aspect and taking a zero trust approach to device validation on the network is another.

As the number of connected devices increases, so does the potential attack surface for cyber criminals. Ensuring the security of IoT devices, networks, and

data has become paramount. Implementing robust security measures in IoT systems is essential to safeguard sensitive data, prevent unauthorised access, and maintain the trust of users and businesses alike.

Key security measures are gaining traction in the IoT landscape and include:

1. **Zero-trust security:** Zero-trust is a security framework that operates on the principle of 'never trust, always verify'. It ensures that every user, device, or system trying to access resources within the network is continuously authenticated and authorised, even if they are already inside the network perimeter. This approach minimises the risk of unauthorised access and lateral movement of threats within the network.
2. **Edge security:** Edge computing brings processing closer to the data source, reducing latency and enhancing real-time decision-making. Edge security ensures that critical data is protected at the device level, reducing the risk of data exposure during transmission to central servers.
3. Related to the above, **secure access service edge (SASE)** is an emerging security model that combines networking and security functions in a unified cloud-based service. By routing all traffic through a cloud-based security stack, SASE enables consistent security policies and real-time threat protection, irrespective of the user's location or the device they are using.

**Intelligence for data monetisation**

In addition to the three areas covered here, there is the general use of intelligence for data monetisation. The ideas associated with tracking devices and deriving intelligence from the data those devices are generating, is giving ways to other forms of monetisation.

This includes creating data ecosystems, whereby information is being processed to deliver enhanced experiences. This is more prevalent in the B2B2C arena, says Tata, such as infotainment services, commerce services, and other areas. ■

**SanCloud finds Oasis with virtual SIM concept**

Tata Communications and **Oasis Smart SIM** (a Tata subsidiary) earlier this year launched **CloudSIM**, a cloud-based embedded subscriber identity module (eSIM). It is a virtual SIM concept, whereby the physical SIM is held in a remote data centre, with client software on the connected device.

**SanCloud**, a provider of bespoke integrated IoT solutions, is one of the first companies to use **CloudSIM**. It will enable SanCloud devices with remote controlling and monitoring capabilities for operational performance of industrial equipment and plants across the manufacturing, supply chain, and automotive sectors. It will also ease IoT deployment.

Delivered through Tata's **MOVE** platform, **CloudSIM** provides on-demand cellular connectivity more securely and more affordably. This changes the traditional way of delivering connectivity on-demand, which typically requires deploying additional SIMs, eSIMs, or iSIMs on the hardware platform, adding costs and complexities.

Marc Murphy, director of software engineering at SanCloud, says: "We are integrating **MOVE** and **CloudSIM** services into our mobile wireless devices. This gives us the flexibility to dynamically change the subscription model in our IoT devices, without having to send an engineer to site to swap a SIM. This is a significant cost saving."

The Internet of Things continues to revolutionise industries and reshape our daily lives. Multi-technology connectivity ensures that IoT devices can communicate efficiently across various environments. Security measures like zero-trust, SASE and edge security help protect against cyber threats and safeguard sensitive data. And data analytics, driven by AI, operational analytics and decision support systems, unleashes the power of IoT data, enabling organisations to make smarter decisions and create more value.

[www.tatacommunications.com](http://www.tatacommunications.com)



# Knowledge comes with experience as IoT pioneers the journeys of tomorrow

IoT has suffered from the growing pains that many new technological innovations experience. Frequently projects have found it hard to scale up from the proof of concept or pilot stages into fully-mature, commercial services and products. To overcome complex customisations and the business, cultural and technological transformation challenges that are the foundation of successful IoT deployments, organisations need partners who have specific IoT knowledge to help them scale and eradicate the barriers to success. Andreas Wolter, the vice president of sales for Europe at Bosch Global Software Technologies tells IoT Now that this knowledge comes with experience and IoT innovators from companies of all sizes should seek out experienced collaborators to drive mass-scale commercial success

**IoT Now: Bosch is an extremely well-known brand across multiple industries. What is the company's strategy for IoT and the specific role of Bosch SDS within that strategy?**

**Andreas Wolter:** Bosch started the IoT journey quite early in 2008. We follow the principle of building new innovative products based on sensors, software and services. As part of the overall strategy the Bosch IoT Suite was developed, always with the intention to build or enable open IoT ecosystems. This not only allows Bosch to generate revenue from selling physical products such as washing machines but also facilitates recurring annual revenue from value-added services. Driving and using open standards and open source technologies was a crucial requirement right from the beginning.

**Bosch Software and Digital Solutions (SDS)** plays a pivotal role in this strategy. It is a part of [Bosch] Global Software Technologies (BGSW) and serves as the external market-facing entity. SDS offers a product and service portfolio that addresses market needs not only for IoT solutions but also in the broader context of developing connected products and services based on the Digital Thread. Additionally, SDS assists customers on their journey towards digital transformation and sustainability. We also have access to the larger Bosch portfolio which allows us to offer complete and holistic solutions for many different vertical markets. ►





**Andreas Wolter**  
Bosch Global Software Technologies

**IoT Now: One of the barriers to massive IoT has been the relatively widespread failure of pilot projects and proof-of-concepts to scale up. How can the challenges of gaining scale be addressed and what do you see as the key reasons behind projects stalling and failing to scale up?**

**AW:** Many IoT solutions are either built from scratch or on very generic IoT platforms which requires a huge amount of customisations. This drives development costs to a significant extent. While this may not pose an immediate issue for pilot projects or proof-of-concepts (PoCs), scaling up IoT solutions brings about additional costs, encompassing not only development but also infrastructure and operations. This can become a critical hurdle, especially when starting with low volumes.

We have also witnessed many failed PoCs and pilots where, for example, the technical complexity has simply been underestimated. Reasons for this can be trying to achieve too much too fast, a lack of the necessary in-house skills or choosing the wrong partners.

In my opinion, one of the most significant challenges in scaling up IoT solutions is the business model. Transitioning from a focus on pure hardware revenue to an annual recurring revenue model, where hardware costs are subsidised through services, poses substantial upfront expenses, with the return on investment (ROI) materialising at a later stage. How organisations navigate this transition is crucial for enterprises of all sizes.

**IoT Now: Is the challenge primarily rooted in technological limitations, or are there underlying organisational, operational and cultural factors that must be addressed to facilitate the transition from pilot projects to widespread, commercially successful success stories? ▶**



***Building innovative IoT solutions can be quite complex, requiring a deep understanding of what's technically feasible, as well as the associated costs and efforts***

**AW:** From my perspective, technical limitations are among the least significant factors contributing to this challenge. It's more a matter of experience and the availability of necessary skills. Building innovative IoT solutions can be quite complex, requiring a deep understanding of what's technically feasible, as well as the associated costs and efforts. This knowledge comes with experience. Transitioning IoT proof of concepts or pilot projects to the scaling phase cannot be treated as a side project alongside one's daily responsibilities.

Shifting from the sale of purely physical products to IoT solutions impacts various facets of a company, including sales, marketing, development and support, necessitating significant organisational, operational and even cultural changes. This requires excellent change management to bring everybody on board. This will not happen overnight. Here again experience is crucial to make this happen.

**IoT Now: What does Bosch SDS do differently here to support your customers in scaling effectively and successfully?**

**AW:** What sets us apart from the competition is our comprehensive approach. We not only offer proven products and solutions that have been successfully utilised within the Bosch Group on numerous occasions. We also have diverse and deep digital engineering capabilities in terms of experience, skills for example embedded software, cloud technologies, security and more. Plus, we have the capacity and infrastructure to bring digital products and services to life, providing continuous support throughout the entire product lifecycle. This includes activities such as hardware design, verification, validation and global product certification.

With a track record of more than 250 IoT projects, including the development of market-leading products like Bosch Smart Home, our customers can have confidence in benefiting from the extensive experience we have gathered over the years and avoid all the above-mentioned traps and challenges.

In addition to this, we recognise the importance of setting up offshore and nearshore development centres as a central component of our digital engineering offering. This strategic approach not only addresses talent shortages but also ensures the rapid and efficient delivery of innovative IoT solutions at an attractive cost.

For further insights you can have a look to our case study on Offshore Development Centres, which is on page 22 in this magazine. We are not offering pure technical solutions and services, but we also support our customers in developing and implementing their go-to-market strategies to ensure successful scaling up.

**IoT Now: Please could you share some examples of projects where this approach has delivered results?**

**AW:** With the Bosch IoT Suite we connect as of today more than 15 million devices. I would like to highlight one of my favorite examples. **Daimler** is using the Bosch IoT Suite for Firmware over the air updates in passenger cars as part of its Vehicle Backend Infrastructure. It plays a key role in creating, running, monitoring and adapting the update process. With up to 100 electronic control units per vehicle you can imagine the complexity of such a solution.

Another remarkable example involves **Variowell**, a sleeptech vendor and a valued Bosch SDS customer. Variowell offers Pepaminto, a sleeptech device in the form of a mattress topper that enhances thermal comfort in different zones. This innovative topper is controlled through a dedicated watch app. Bosch SDS provided extensive support to Variowell right from the initial stages of product development. This support included designing the hardware printed circuit board (PCB) of the controller connected to the mattress topper. Additionally, we developed embedded software for the controller and created the app for the **Apple Watch**.

We are very proud that Pepaminto has won the CES Innovation Award 2023 for Digital Health and our contributions played a pivotal role in achieving this recognition. Furthermore, we are currently providing ongoing support to Variowell as it embarks on the journey of scaling up its business.

In another significant initiative, we are collaborating with a European tyre manufacturer in its endeavour to create advanced intelligent connected tyres for trucks. These tyres transcend traditional measurements like temperature and pressure by incorporating additional data from the vehicle and utilising artificial intelligence (AI). This approach enables precise predictions of tyre health, wear and tear and expected lifespan. The outcomes include increased vehicle uptime, significant cost reductions, for example reduced fuel consumption, enhanced safety and improved sustainability. ▶



Fleet owners can now proactively plan their tyre maintenance based on real-time field data, moving away from preventive maintenance and adopting predictive maintenance. The solution is currently undergoing real-life testing in Europe, with plans for a commercial rollout in early 2024. We are literally pioneering the journeys of tomorrow.

**IoT Now: In what ways do you expect to see the IoT industry develop in the nearer future and over the coming 2-3 years?**

**AW:** Over the past 12 months, we've witnessed a consolidation among players in the IoT industry, with even major vendors withdrawing. We expect that this consolidation trend will continue in the years to come.

Furthermore, owing to evolving legal requirements in Europe and the United States, there is currently a significant demand for firmware and software updates over-the-air so called FOTA and SOTA solutions. Every electronic product will have to support firmware/software update capabilities to do security patches as well as for providing new device features. This demand is expected to continue growing and will prompt the

development of more efficient methods for globally deploying software update campaigns.

Digital Thread is yet another trend we are seeing. With the Digital Thread you create consistency, collaboration, and alignment across all functions in the company. It seeks to break down organisational silos, ensuring full traceability of information throughout the product journey. This, in turn, leads to data-driven decision-making processes, streamlined engineering changes, reduced time to market, and increased revenue from aftersales services.

Furthermore, we expect notable advancements in artificial intelligence, including generative AI. These innovations will not only improve predictive and prescriptive maintenance but also make the development and support of new products more efficient. The Bosch Group has the objective to integrate artificial intelligence into all solutions and products, or use it in their development and production, by 2025. In this context, Bosch SDS offers AIShield, a product designed to protect AI models from threats. This safeguard is crucial for customer trust and acceptance. ■

***Over the past 12 months, we've witnessed a consolidation among players in the IoT industry, with even major vendors withdrawing***



# Connected device revolution unleashes offshore development's full business potential

In an era defined by rapid technological evolution especially for constantly growing and changing digital ecosystems, businesses face an ever growing need to stay agile, innovative, and competitive. CIOs globally also face budget reductions that not only impact product development, but also all aspects of operations and support. In this pursuit of excellence, the successful implementation of offshore development centres (ODC) has emerged as a transformative strategy. An ODC is a remote office located in another country, equipped with the necessary personnel and infrastructure for software development. These centres provide not only development resources but also handle recruitment, administration, infrastructure and more

To get the benefits outlined above, enterprises don't always need to establish and operate an offshore centre themselves. Specialised service providers can support enterprises in setting up ODCs. Such partners would be critical to the ODC's success, because the enterprise would be venturing into unfamiliar territory, it would heavily rely on the partner's advice, recommendations and hard-earned experience. As a result, it is critical to identify the appropriate ODC partner. Some key considerations for selecting the right ODC partner are:

**Examine the vendor's portfolio** - A portfolio acts as an evidence of claims made and results achieved. Due diligence must be undertaken on

the availability of talent pools, intellectual property, and historical projects that match the unique project requirements.

**Customer feedback** - Third-party evaluations and client testimonials might provide insight into what to expect from an ODC service provider.

**Legal experience** - Ascertain that the chosen partner meets the legal requirements for establishing an ODC and has the legal authority to operate an ODC in the desired country.

The **Bosch Group** has established ODCs for its own purposes already 25 years ago and employs today more than 38,000 engineers in countries ►

## SPONSORED CASE STUDY



like India, Vietnam and Mexico. Nearly every Bosch product is supported with contributions from offshore locations.

**Bosch Software and Digital Solutions (SDS)** runs ODCs for external customers. This case study describes how it successfully utilised the ODC model to help a multinational producer of industrial sensors and solutions enhance its product ecosystem and engineering capabilities.

## The requirement

The client, a producer of industrial sensors and sensor-based solutions, aimed to create a connected product ecosystem. From the specific customer perspective, this ecosystem will achieve three elementary objectives. These goals included differentiation from competitors, increased customer value and establishing end-to-end product engineering support. However, they faced challenges in terms of expertise, resources and global implementation.

## The approach

Bosch SDS addressed the client’s needs with a holistic solution backed by the Bosch IoT Suite. This solution aimed to create a managed service for a global rollout, generate insights and enhance the client’s products. The ODC model was a key component for providing the customer solution, involving project managers, scrum masters, developers, architects, and various specialists. The ODC team possessed diverse skills such as embedded software deployment, gateway administration, cloud management, IoT platform management, edge computing expertise, DevOps, validation and quality engineering. To ensure seamless collaboration, a two-way team structure was established, granting the client full visibility into development efforts and project control.

## The outcome

With this approach, Bosch SDS devised a comprehensive solution, strategically utilising an ODC model and hereby added value to the client’s business:

- **Managed Service Setup:** Bosch established a managed service, spanning Europe and China, using the ODC Methodology
- **IoT Platform Integration:** Customer devices were seamlessly integrated into the Bosch IoT Suite, facilitating effective data collection and data analysis
- **User Access and Dashboards:** Bosch provided user access to the IoT Platform for multiple tenants and created role-based dashboards for

enhanced data visualisation and control

- **Data Management and Insights:** A data management service was implemented, enabling downloadable statistics and insights for informed decision-making.
- **Commercial Rollout Recommendations:** Bosch offered valuable recommendations for commercial rollouts and improvements, aiding the client’s strategic planning.
- **Knowledge Management:** A knowledge management system was established by retaining core talent with expertise in the developed components. This ensured continuity and accelerated development.

## Benefits

The benefits of ODCs are manifold. The obvious benefits are faster access to engineers with the required skillset for project or product development execution. Offshore development centers are in many cases located in low-cost countries which helps enterprises to manage their development and operations costs appropriately. With the support of Bosch SDS the customer gained the following additional benefits.

- **Enhanced differentiation:** The connected ecosystem empowered the customer to differentiate their products, adding a competitive edge in the market.
- **Increased customer value:** The seamless integration of the devices into the IoT Suite enabled better insights, contributing to enhanced customer value and satisfaction.
- **Global rollout success:** The managed service and ODC methodology facilitated the global rollout of the connected ecosystem, ensuring consistent implementation across regions.
- **Informed decision making:** Insights from the data management service empowered the client with data driven insights for strategic decision making.

Bosch SDS’s approach of utilising an ODC, coupled with the Bosch IoT Suite, effectively addressed the client’s challenges and needs. By creating a connected product ecosystem, enhancing customer value, and providing skilled resources through the ODC model, the client achieved their objectives while remaining competitive in a rapidly evolving market. ■

[www.bosch-softwaretechnologies.com](http://www.bosch-softwaretechnologies.com)

***Bosch SDS addressed the client’s needs with a holistic solution backed by the Bosch IoT Suite***



# IoT Tech Expo Europe makes a Dutch splash

IoT Tech Expo Europe 2023 comes to Amsterdam, The Netherlands, on 26-27 September at the RAI exhibition and convention centre. Antony Savvas looks at the main features of the industry event

The organisers say it is set to draw a crowd of around 6,000 attendees, and will include 150 IoT industry speakers and 200 exhibitors.

The Expo will also include a variety of co-located events. One of the focal points of the event will be the role of 5G in shaping the future of the Internet of Things. Experts will explore how 5G networks enable faster and more reliable connections, paving the way for innovative IoT applications across various sectors.

## Big speaker line-up

Featured speakers and panellists taking part in IoT Tech Expo include: Cornelia Schaurecker, global group director of big data and AI at **Vodafone**; Thomas Kleine, CIO of **Pfizer**; Nicolás Torralba, head of IoT for platforms and digital solutions at **Airbus**; Bhavdeep Magar, principal service engineer for IoT projects at **BP**; Najeeb Younossi, head of

connected experiences and software at **BAT**; Karinna Calin, head of global CX and data analytics at **Unilever**; and Gaurav Lakhwani, transition programme manager for **Nike**; among many others.

## Key industry topics

There will be discussions about the challenges and opportunities related to data privacy and cyber security in an increasingly interconnected world. Topics such as edge computing, artificial intelligence and machine learning will also be explored, as these technologies play crucial roles in enhancing IoT capabilities and driving transformative solutions.

Furthermore, the Expo will emphasise the significance of environmental sustainability in the IoT ecosystem. Participants will learn about green IoT solutions and their potential to address environmental challenges while advancing technology. ►





Among the exhibitors, **Eseye** recently announced a new IoT Readiness Level (IRL) Index that allows organisations to compare project performance with others in their industry verticals. In addition, the firm is now offering a subscription-based service called IoT LaunchPad, providing a flexible range of repeatable services tailored to each customer project.

Eseye will also be showcasing its white label Integra Global IoT Connectivity Platform for MNOs (mobile network operators), which is based on its Infinity IoT Platform for Enterprises. This offers a single pane of glass for all connectivity, enabling everything from device management and security to reporting and subscription management.

**Tata Communications** recently completed the acquisition of the remaining equity (41.9%) in **Oasis Smart SIM**, a leading embedded-SIM (eSIM) technology provider. It now holds 100% of the company and will use the show to trumpet some of the new products and services it is developing with Oasis.

The combined MOVE platform from Tata with Oasis eSIM technology will equip global enterprises with end-to-end, scalable and secure eSIM connectivity. "This is crucial for delivering intelligent and intuitive IoT applications", and "stitching together a digital fabric of secure, connected and digital experiences", says Tata.

Tata Communications and Oasis earlier this year launched CloudSIM, a virtual SIM concept, whereby the physical SIM is held in a remote data centre with client software on the connected device. It is promoted as a good solution for on-demand back-up connectivity, and it reduces cost by only connecting a device when needed. It also improves security, as a SIM slot or embedded SIM is not required on the device.

### Security

Iain Davidson, senior product marketing manager at **Wireless Logic**, says of the show: "Year-on-year, IoT Tech Expo Europe brings together leaders of industry to showcase the next generation of solutions and share their knowledge, as we look to solve some of the more complex business challenges. I expect recent legislation has made security a top priority for vendors as the number of threats increases, with revenue and reputational consequences for organisations and their customers."

Davidson says the UK Product Security and Telecommunications Infrastructure Act and The European Cyber Resilience Act will have forced providers to review their products and adopt a secure-by-design methodology. This

will likely be explored further throughout the conference, with organisations explaining how they have responded in order to maintain customer security or safety.

Remote SIM provisioning will also be important at the show, says Davidson. With the new standard SGP.32 coming out, which will move the control of network profile downloads away from networks and into the devices, IoT customers will be able to switch profiles far more easily.

The new standard provides for an IoT Profile Assistant (IPA) in the SIM, or on the device, which contacts a remote connectivity manager to kick off the chain of command to download the relevant profile. This gives companies more control and will simplify manufacturing, deployment and lifecycle management, ultimately reducing costs and time to market.

### Let's party

Attendees can look forward to the IoT Tech Expo Europe 2023 networking party at the Strandzuid Boathouse. Located by the waterfront, the Boathouse will offer a chance to network and collaborate with fellow industry professionals, entrepreneurs, innovators, and IoT enthusiasts with the help of food and beverages.

As mentioned, there are co-located events at the show, including the AI & Big Data Expo, the Blockchain Expo, the Cyber Security & Cloud Expo, Digital Transformation Week, and the Edge Computing Expo.

### Networking app

An app is scheduled to be launched around two weeks before the show, enabling attendees to navigate through the conference agenda, and to personalise their schedules.

The networking capabilities of the app also give visitors the opportunity to interact and engage with a diverse array of participants, including fellow industry professionals, speakers, sponsors, and exhibitors.

### Ticket types

The Ultimate Pass costs €1,199 and covers two full days of the IoT Tech Expo Conference Tracks, and entrance to the co-located events. It also includes lunches and the networking party on day one. You also gain access to the Content Library Hub, featuring over 250 hours of presentation recordings to revisit the sessions any time you want.

The Gold Pass costs €849, covering both days of the Conference Tracks, lunches, the networking party, and access to the Content Library Hub. There is also the free EXPO Pass covering the Expo floor and access to networking and hospitality areas. ■

**Attendees can look forward to the IoT Tech Expo Europe 2023 networking party at the Strandzuid Boathouse**

[www.iottechexpo.com/europe/](http://www.iottechexpo.com/europe/)



# Pioneer the future of connectivity and innovation in Amsterdam

Amsterdam, the vibrant Dutch city of canals and forward-thinking culture, is gearing up to host the highly anticipated IoT Tech Expo Europe on 26-27 September 2023. This prestigious event, taking place at the RAI exhibition and convention centre, is set to draw an impressive crowd of 6,000 attendees, including 150 distinguished speakers, 200 exhibitors and will feature six co-located events. The IoT Tech Expo Europe 2023 promises to be a powerhouse of insights, knowledge-sharing and networking opportunities for the rapidly evolving world of the Internet of Things (IoT)

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## One of the focal points of the event will be the role of 5G in shaping the future of IoT

The IoT Tech Expo Europe has earned a reputation as a leading global conference and exhibition for IoT enthusiasts, professionals, industry leaders, and tech enthusiasts alike. With a focus on innovation, cutting-edge technologies, and real-world applications, this event has become a beacon for those seeking to explore the transformative potential of IoT across diverse sectors.

### IoT Tech Expo agenda

The Expo's organisers have put together a comprehensive agenda that addresses various aspects of the Internet of Things (IoT) landscape. They have curated topics that span the entire spectrum of IoT technologies and applications, ensuring that participants from different industries and backgrounds can find valuable insights and information relevant to their specific interests.

One of the focal points of the event will be the role of 5G in shaping the future of IoT. Experts will explore how 5G networks enable faster and more reliable connections, paving the way for innovative IoT applications across various sectors. Additionally, there will be discussions about the challenges and opportunities related to data privacy and cybersecurity in an increasingly interconnected world.

The agenda will also delve into the realm of cutting-edge technologies that complement IoT. Topics such as edge computing, artificial intelligence (AI), and machine learning will be explored, as these technologies play crucial roles in enhancing IoT capabilities and driving transformative solutions.

Furthermore, the expo will emphasize the significance of environmental sustainability in the IoT ecosystem. Participants will learn about green IoT solutions and their potential to address environmental challenges while advancing technology.

### Key themes include:

1. **Digital Twins:** Staying on track with digital twins
2. **Supply Chains:** IoT serving sustainability in supply chains
3. **Aerospace and Aviation:** Implementing IoT inside the aircraft
4. **Data Management:** IoT data handling
5. **Building Automation:** Building automation, the infrastructures of tomorrow
6. **Edge Computing:** The evolution of edge - where do we go next?
7. **Connectivity Landscape:** A holistic approach to the connectivity landscape
8. **5G and AI:** AI opportunities in 5G
9. **Resilient Connectivity:** Maintaining connectivity in a time of war
10. **Security Challenges:** Examining the current IoT security landscape
11. **Device Security:** The ins and outs of device security ▶



With such a diverse range of themes, the IoT Tech Expo Europe 2023 promises to be a valuable platform for knowledge-sharing, idea generation, and networking. Attendees will have the opportunity to engage with experts, industry leaders, and fellow enthusiasts, gaining valuable insights that can shape their understanding and approach to IoT in their respective domains.

### Inspirational speakers

The eagerly anticipated IoT Tech Expo Europe 2023 is set to be an extraordinary event, bringing together a remarkable and diverse line-up of visionaries, thought leaders, and industry experts who will take the stage and captivate the audience with their wealth of knowledge and invaluable experiences. With representatives hailing from various sectors and prestigious global organisations, this exceptional gathering promises to be a melting pot of cutting-edge ideas, innovative concepts and groundbreaking perspectives.

The stage is set for an unforgettable experience as these esteemed speakers, each a trailblazer in their own right, are driven by a shared passion to inspire and empower attendees with their transformative insights. By sharing their success stories, challenges, and breakthrough moments, they aim to ignite the spark of innovation within each participant, leaving an indelible impact on the world of IoT and beyond.

Throughout the event, attendees will have the unparalleled opportunity to engage with these luminaries, forging meaningful connections, and gaining unprecedented access to the latest developments and trends within the IoT landscape. It is an occasion that celebrates the spirit of collaboration, as participants from diverse backgrounds come together to explore the vast potential of IoT technology and its far-reaching implications for businesses and societies at large.

### Featured speakers and panellists taking part in IoT Tech Expo include:

- Cornelia Schaurecker** - global group director of Big Data and AI - Vodafone
- Thomas Kleine** - CIO - Pfizer
- Anca Iordanescu** - vice president of Engineering, Store of the future; co-founder - IKEA; WomenInTech Sweden
- Cristina Duta** - director of Intelligent Automation - AECOM
- Garima Singh** - chief architect - Sandvik
- Nicolás Torralba** - head of IoT, Platforms & Digital Solutions - Airbus
- Guillermo Renancio** - director of Technology, Expansion and Strategic Alliances -- Nueva Pescanova Group
- Bhavdeep Magar** - principal service engineer - IoT Projects - BP
- Anvesh Kulkarni** - head of Product Lifecycle Management - Global Manufacturing Process Lead - AGCO
- Najeeb Younossi** - head of Connected Experiences and Software - BAT
- Fatiha Hammadi** - head of Digital & Innovation - Saria
- Karina Calin** - head of Global CX & Data Analytics - Unilever
- Oleg Polovynko** - CIO - Kyiv City Council
- Victoria Itskovych** - deputy CIO - Kyiv City Council
- Petro Olenych** - chief digital transformation officer - Kyiv City Council
- Saurav Palit** - senior head of Smart Devices and Strategic Alliances - Henkel
- Robert Bakelaar** - IoT solution architect - Royal Vopak
- Dr. Satyajit Wattamwar** - Data Science & Digital Expertise leader - Unilever
- Ben Lomax Thorpe** - head of Digital Twin - Royal HaskoningDHV
- Teppo Rantanen** - executive director - City of Tampere
- Bruno Ávila** - i-Team director - Digital Urban Planning Lab - City of Amsterdam
- Dr. Christina Yan Zhang** - CEO - Metaverse Institute
- Roland van der Heijden** - programme manager - Digital City Rotterdam - City of Rotterdam
- Francesco Melegoni** - sales accounts manager - Micro Systems
- Priya Gupta** - senior R&D engineer - Vanderlande
- Gaurav Lakhwani** - transition programme manager - Nike
- Noel Wirzius** - product manager, Network APIs - Deutsche Telekom Global Carrier
- Yamina Kelm** - product manager - Deutsche Telekom Global Carrier
- Anand Gandhi** - senior vice president of Enterprise IoT Solutions - Eseye
- Srinath Panchavati** - cyber security officer and scrum master - Eindhoven University of Technology
- Nicholas Cointepas** - Partner Success & Ventures manager - Plug and Play Tech Center
- Harold Weffers** - member of NEN Standardization Committee on information security, cyber security, and privacy - NEN
- Marc-Eliau Bégin** - CEO and co-founder - SixSq
- Paul Lambrechts** - principal application engineer - MathWorks
- Aymen Ismail** - head of Customer Engagement Solutions - smart Europe GmbH
- Dr. Alice Li** - vice-chair - ETSI ISG MEC ▶



**By securing either the Gold or Ultimate tickets for the event, attendees gain exclusive privileges with access to the official AI-powered mobile and desktop app**

**VIP Networking Party at Strandzuid Boathouse**

After a day of informative talks, panel discussions, and exploring the latest IoT innovations, attendees will get a chance to unwind and network at the Strandzuid Boathouse. This networking party will take place against a scenic waterfront backdrop, providing the perfect setting for making new connections, exchanging ideas, and building partnerships with fellow industry professionals.

As the sun sets on the city, marking the end of an eventful day, the excitement won't die down. People will be looking forward to the IoT Tech Expo Europe 2023 networking party at the Strandzuid Boathouse.

Located by the waterfront, the Strandzuid Boathouse will offer a serene and picturesque atmosphere, ideal for networking and collaboration. Industry professionals, entrepreneurs, innovators, and IoT enthusiasts from around the world will come together to engage in conversations, share perspectives, and explore potential collaborations.

With outdoor seating areas and cozy spaces, attendees will have the opportunity to discuss IoT technologies, trends, and personal experiences in a relaxed environment. Alongside networking, there will be a variety of delicious food and beverages, adding to the enjoyable evening.

**Five collocated events**

In addition to the highly anticipated IoT Tech Expo, there will be five co-located events taking place, each offering a unique technological focus. Attendees will have the opportunity to explore AI & Big Data Expo, Blockchain Expo, Cyber Security & Cloud Expo, Digital Transformation Week, and Edge Computing Expo. Throughout these co-located events, industry experts and thought leaders will converge to share their insights and expertise, creating a comprehensive and diverse experience for all participants. With cutting-edge innovations and a wide range of topics on display, this convergence of events promises an unparalleled opportunity for tech enthusiasts and professionals to immerse themselves in the latest

advancements across multiple domains, all within one convenient location. Don't miss out on this exceptional chance to expand knowledge and network with the best in the field.

**Networking app**

By securing either the Gold or Ultimate tickets for the event, attendees gain exclusive privileges with access to the official AI-powered mobile and desktop app. This cutting-edge application is scheduled to be launched around two weeks before the show, offering a feature-rich digital gateway that will enrich their entire event experience.

With the app at their fingertips, attendees can effortlessly navigate through the conference agenda, granting them an unparalleled level of control over their event participation. They can delve into the diverse range of sessions and presentations, each carefully curated to cater to various interests and industries. By personalizing their schedules with the sessions that pique their curiosity, they ensure that they make the most out of their attendance, ensuring no valuable insights go unnoticed.

The networking capabilities of the app further elevate the event's significance, fostering connections that transcend geographical boundaries. Attendees have the remarkable opportunity to interact and engage with a diverse array of participants, including fellow industry professionals, inspiring speakers, influential sponsors, and innovative exhibitors. Through chat and videocalls, meaningful exchanges of ideas and experiences are facilitated, paving the way for potential collaborations and partnerships. Participants can also plan ahead and meet during event in the networking areas.

Leveraging advanced algorithms, the app intelligently analyzes attendees' interests, industries, and preferences to provide personalized recommendations of potential connections they might want to meet. This cutting-edge feature promises to enhance networking opportunities significantly, enabling attendees to make meaningful connections with like-minded professionals and industry leaders. ▶



As the event draws near, the app’s functionalities come to life, serving as an indispensable companion throughout the duration of the conference. Attendees can seamlessly stay updated with real-time notifications, ensuring they never miss any schedule changes, exciting announcements, or last-minute additions to the agenda.

Moreover, the app’s user-friendly interface provides an intuitive platform to explore the event’s exhibitors. Attendees can delve into the products, services, and innovations showcased by the exhibitors, opening avenues for discovering cutting-edge solutions that could revolutionize their industries.

Beyond the confines of physical boundaries, the AI-powered app creates a truly immersive event experience. Through the power of technology, the event transcends traditional limitations, allowing attendees to explore an expansive world of knowledge and inspiration from the comfort of their mobile devices or desktops.

The Gold and Ultimate tickets, with their access to this groundbreaking app, prove to be a game-changer for attendees, as they gain unprecedented control over their event engagement. This powerful tool empowers them to make well-informed choices, fostering connections that go beyond the event’s timeframe and nurturing an enduring sense of community within the dynamic world of technology and innovation. ■

## Ticket types

### ULTIMATE PASS - €1199

Get the most out of the IoT Tech Expo with our Ultimate Pass! Experience the complete conference with two full days of IoT Tech Expo Conference Tracks, and dive into other cutting-edge topics with the Co-Located Events Conference Tracks, including AI & Big Data, Digital Transformation, Edge Computing, Blockchain, and Cyber Security & Cloud. Explore the Exhibition Floor & Tradeshow, enjoy a complimentary lunch, and join the Networking Party on day 1. With AI Powered Desktop & Mobile Apps, you’ll stay connected throughout the event. Plus, gain access to the Content Library Hub, featuring over 250 hours of presentation recordings to revisit the sessions anytime you want!

### GOLD PASS - €849

Our Gold Pass offers fantastic value! Attend both days of the IoT Tech Expo Conference Track, explore the Exhibition Floor & Tradeshow, and indulge in a delicious lunch. Don’t miss the Networking Party on day 1 for valuable connections. Stay informed with AI Powered Desktop & Mobile Apps, and access the Content Library Hub, containing over 250 hours of presentation recordings, to keep up with the latest insights.

### FREE EXPO PASS - €0

Experience the excitement of our Expo Floor, where you can explore transformational technologies, witness live demos, and engage with over 250 exhibitors. Listen to free presentations and connect with industry peers and leaders in the Networking and Hospitality areas. Access the Content Library Hub with over 250 hours of presentation recordings to delve deeper into the world of tech!

### CONTENT LIBRARY HUB PASS - €0

For tech enthusiasts who prefer on-demand content, our Content Library Hub Pass is ideal! Enjoy a 12-month access to the TechHub & Content Library, updated regularly with new videos and resources. Watch on-demand recordings from live TechEx events, explore webinar recordings from TechForge Media, and gain access to exclusive resources and thought-leadership content from our esteemed event partners.

All ticket types can be accessed via the following link:  
<https://www.iottechexpo.com/europe/ticket-registration-2023/>

### Event details

**IoT Tech Expo Europe**  
**26-27 September, 2023**  
**RAI, Amsterdam**

Registration page: <https://www.iottechexpo.com/europe/register-your-interest-2023/>  
 Website: [www.iottechexpo.com/europe](http://www.iottechexpo.com/europe)  
 Contact: [iot@techexevent.com](mailto:iot@techexevent.com)

### Social Handles

Twitter: [@iottechexpo](https://twitter.com/iottechexpo) <https://twitter.com/iottechexpo>  
 Facebook: <https://www.facebook.com/iottechexpo/>  
 LinkedIn: <https://www.linkedin.com/company/18852416>  
 LinkedIn event: <https://www.linkedin.com/events/6983498970283089920/about/>



## Our pick of IoT industry's upcoming events

### SEPTEMBER

AI Hardware & Edge AI Summit

<https://www.iot-now.com/event/ai-hardware-edge-ai-summit/>



Chief Data & Analytics Officer – Government

<https://www.iot-now.com/event/chief-data-analytics-officer-government/>

SIDO Lyon

<https://www.iot-now.com/event/sido-lyon-2/>

The Things Conference 2023 Amsterdam

<https://www.iot-now.com/event/the-things-conference-2023-amsterdam/>

Quantum Business Europe 2023

<https://www.iot-now.com/event/quantum-business-europe-2023/>

IoT Tech Expo Europe

<https://www.iot-now.com/event/iot-tech-expo-europe-2/>



AI & Big Data Expo Europe  
<https://www.iot-now.com/event/ai-big-data-expo-europe/>

Cyber Security & Cloud Europe

<https://www.iot-now.com/event/cyber-security-cloud-europe/>

MWC Las Vegas 2023

<https://www.iot-now.com/event/mwc-las-vegas-2023/>

### OCTOBER



Supply Chain Europe 2023  
<https://www.iot-now.com/event/supply-chain-europe-2023/>

Network X 2023

<https://www.iot-now.com/event/network-x-2023/>

### NOVEMBER

Enlite Europe 2023

<https://www.iot-now.com/event/enlite-europe-2023/>



Smart Cities Connect

<https://www.iot-now.com/event/smart-cities-connect/>

IoT Tech Expo Global

<https://www.iot-now.com/event/iot-tech-expo-global-2/>

Digital Transformation Week Global

<https://www.iot-now.com/event/digital-transformation-week-global-2/>

Cyber Security & Cloud Global

<https://www.iot-now.com/event/cyber-security-cloud-global/>

### DECEMBER



GIANT's Mental Health Tech Show

<https://www.iot-now.com/event/giants-mental-health-tech-show/>

GIANT's Women's Health Tech Show

<https://www.iot-now.com/event/giants-womens-health-tech-show/>

GIANT's Future Hospital Show

<https://www.iot-now.com/event/giants-future-hospital-show/>

GIANT's UK National ICS Congress

<https://www.iot-now.com/event/giants-uk-national-ics-congress/>

Chief Data & Analytics Officer – APEX West

<https://www.iot-now.com/event/chief-data-analytics-officer-apex-west/>

SIDO Paris

<https://www.iot-now.com/event/sido-paris-2/>

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▶ **Register Here:**

[www.iottechexpo.com/europe](http://www.iottechexpo.com/europe)



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