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With a global carrier library that is based on interconnected local core mobile networks, floLIVE ensures low latency, high performance and full compliance with privacy acts, data regulations and roaming restrictions. As of today, more than 20 mobile operators are on board the platform, giving companies multi-tier connectivity access.

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Bye-bye to bad experiences

Sometimes you never realise quite how bad something is until a better alternative emerges. For cellular IoT connectivity users, those alternatives are now becoming clear with IoT-specific standards such as SGP.32 poised to be finalised and enabling technologies, such as embedded and integrated SIM, and truly global platforms coming to market



George Malim,
managing editor

The recent advances in, and the new wave of positivity around, cellular communications that was in evidence at this year's MWC Barcelona has caused me to take a step back and consider just how bad the experience of cellular IoT has been. It was never going to be a great experience given that cellular IoT was an afterthought and has therefore had to ride on systems and processes that were designed to support consumer mobile users but IoT developers

have had to put up with that for almost two decades. A whole industry has emerged around making cellular IoT connections possible and then easy to manage in the interim.

The reality has been that managing cellular IoT connections, even for thousands of devices, has been fundamentally the same as managing the mobile phone connections of your children. You started by getting a SIM card mailed to you from your provider and then physically installed that into the child's phone. You could have some choice and exert some control by setting up their bundle and denying various add-ons and with that, the device was effectively up and running.

Then you're in the management phase. Lost and stolen devices mean new SIM cards to be ordered, signed for and installed. Trips abroad mean warnings about roaming charges need to be issued or, in extreme cases, advice to buy a new SIM card on entering a country needs to be given. Next, you need to deal with the current package not being sufficient for the data needs of child A. Should you step up to the next bundle or make them wait until the next month's fresh package starts?

Further complexities emerge. What happens if you change provider and want to take the children with you? What happens if you want a single bill for the whole family's fleet of devices? The answer is call centre interactions, oddly presented bills and no easy way to see who is consuming what and when.

The shock here is that IoT deployments have coped with all of this, especially as the market has scaled up. No doubt, communications management platform providers have done a good job of abstracting the complexities away from their IoT customers but there are still too many challenges involved with basic SIM management for the automated era of hyperscale IoT.

It's excellent news then that we now have made-for-IoT standards and technologies in place that will simplify global device deployments and I was delighted to see the ecosystem that surrounds cellular IoT connectivity demonstrate its maturity at MWC Barcelona. The carriers get it, too. The game now is about making cellular IoT easy, frictionless, automated, robust, secure and consistent. All I need is someone to do the same in the consumer market.

Enjoy the magazine!

George Malim



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Wireless Logic acquires Arqia

Wireless Logic, a global provider of IoT solutions, has announced the acquisition of **Arqia**, one of Brazil's largest independent authorised MVNOs. By joining forces with Arqia, Wireless Logic gains deeper access to the rapidly expanding LatAm market and strengthens its ability to support enterprises scaling up IoT deployments across the region. Arqia, formerly part of the **Datora Group**, is a specialist in M2M and IoT connectivity, offering secure, reliable communication between devices.

With more than three million managed connections and a team of more than 200 employees, Arqia has built a strong presence in the region. Its services help businesses across industries boost productivity and accelerate innovation. The acquisition enhances Wireless Logic's capacity to deliver fast, compliant connectivity across Latin America. Notably, Arqia holds one of just 15 authorised MVNO licences issued by **ANATEL**, Brazil's National Telecommunications Agency, allowing it to provide national mobile and IoT services without requiring new network infrastructure.

"Arqia's skilled team brings extensive expertise in the Latin American market,



Oliver Tucker, Wireless Logic

along with valuable insights and capabilities that perfectly align with our global growth vision," said Oliver Tucker, the co-founder and chief executive of Wireless Logic. "Together, we can extend our reach and deliver cutting-edge IoT connectivity solutions that enable enterprises to scale seamlessly and seize new opportunities in an increasingly connected world. We're excited for the journey ahead."

This agreement strengthens Wireless Logic's position by driving global expansion, diversifying market channels, and enhancing its service portfolio. The acquisition builds on the company's recent additions of **Webbing**, **Blue Wireless** and **loThink Solutions**, reinforcing its commitment to sustained growth and innovation. ■

Trasna acquires u-blox cellular IoT modules

u-blox has announced the transfer of its cellular Internet of Things (IoT) module business to **Trasna**, a semiconductor and IoT solutions provider. This move reinforces u-blox's decision to focus on its core locate business while enabling Trasna to strengthen its IoT connectivity chip-to-cloud offering in the original equipment manufacturing (OEM) sector.

The acquisition includes u-blox's cellular module technology intellectual property (IP), workforce, sites and product portfolio, with Trasna committing to retain all employees, customers and operations. This strengthens Trasna's position as a comprehensive cellular IoT solutions provider, offering end-to-end capabilities spanning semiconductor chip design, SIM and eSIM manufacturing, and cloud-based remote SIM and device management services.

The cellular IoT market, projected by IoT Analytics to grow at a compound annual growth rate (CAGR) of 15% until 2030, presents a substantial opportunity for Trasna. The deal enhances Trasna's market reach, particularly in the metering, medical and industrial IoT sectors, using u-blox's established relationships with OEMs and its global distribution network.



Stéphane Fund, Trasna

"This deal propels Trasna into fifth gear in the IoT cellular market," said Stéphane Fund, the CEO of Trasna. "By combining u-blox's expertise in modems with Trasna's semiconductor and IoT platform solutions, we are unlocking new synergies that drive innovation, efficiency and a fully integrated IoT connectivity solution for our customers."

Stephan Zizala, the CEO of u-blox, added: "We are pleased that Trasna intends to acquire the cellular module division, and we are confident that the transition of employees, customers and partners will be seamless." ■

News in Brief

Spanish government invests €13.8m in Sateliot

Sateliot is in the final stage of a Series B financing round of €70 million following a €13.8 million investment from the Spanish Society for Technological Transformation (SETT) dependent on the Spanish government, which has been approved by the Council of Ministers. The funds will be invested in a constellation of more than 100 satellites to deliver critical infrastructure designed to ensure real-time connectivity in areas without signal coverage. This will enable applications across defence, security, logistics and critical infrastructure management sectors.

With this transaction, Sateliot progresses toward closing its Series B financing round, having secured €58.8 million of the €70 million target. SETT's injection follows **Global Portfolio Investments'** contribution of €10 million and a convertible note of €5.2 million.

As part of its Series B round, Sateliot has also secured a €30 million debt injection from the **European Investment Bank (EIB)**, marking the EIB's first venture debt operation in the space sector. This support further strengthens Sateliot's role in developing sovereign telecommunications infrastructure when both NATO and the European Union (EU) call for increased defence spending and enhanced space capabilities. ■



BICS launches eSIM Hub to simplify global enterprise IoT deployments

BICS, a **Proximus Global** company, has launched eSIM Hub, a platform to support Internet of Things (IoT) businesses, like manufacturers and OEMs to reduce the complexity of managing eSIM connectivity globally. BICS' eSIM Hub is an orchestration platform that empowers IoT players with international deployments to manage devices globally. The platform works alongside BICS' SIM for Things global roaming IoT connectivity to provision, manage and even switch connectivity for eSIMs.

It will address challenges like permanent roaming restrictions and provide a unified solution for roaming and local IoT connectivity with one eSIM, one platform, one contract and one invoice. The launch coincides with the upcoming **GSMA** IoT standard SGP.32 for remote SIM provisioning (RSP). This standard will formalise the role of IoT connectivity providers, creating three distinct roles: network operator, reseller and a new entity, the eSIM orchestrator.

BICS' eSIM Hub is purpose-built to play this new role on a global scale, managing device profiles and connectivity from dozens of operators through a single pane of glass platform – supporting eSIM deployment on a technical, operational and commercial level. eSIM Hub delivers seamless global coverage, connecting IoT devices to the best available local networks across 190 countries and over 700 operators, including key regions like North America, Mexico, Brazil and China. Using eUICC SIM cards and over-the-air (OTA) provisioning, devices can effortlessly switch between global and local networks,



Christophe Van de Weyer, Proximus Global

ensuring consistent performance and scalable, compliant and cost-effective deployments.

"IoT promises to make businesses more connected than ever, but technical barriers and international borders add layers of complexity," says Luc Vidal-Madjar, the head of IoT and roaming solutions at BICS. "Our eSIM Hub combined with our global IoT connectivity solution, SIM for Things, removes these barriers, making it simple for businesses to seamlessly deploy and monetise IoT."

Christophe Van de Weyer, the chief product officer at Proximus Global, added: "The eSIM Hub is a game-changer, empowering enterprises to manage global IoT deployments effortlessly with advanced orchestration technology. Our mission is to push the boundaries of innovation in the IoT space, simplifying global IoT integration and making it more accessible for enterprises worldwide." ■

News in Brief

Transport and logistics cellular data to exceed 2 exabytes by 2030

New research from **Kaleido Intelligence** has found that cellular data generated by the transport and logistics sector will grow at a CAGR of 23% between 2024 and 2030. This will generate over US\$65 billion in revenue for connectivity service providers in the sector in the latter year.

The report, 'Transport & Logistics Cellular IoT Opportunities 2025', shows how a large proportion of this revenue will come from the increasing use of infotainment services, as automakers continue to push software-defined vehicle features into their newest releases. However, these have received a lukewarm reception from drivers so far, with under 300 million consumer vehicles expected to use these services by 2030. Telematics will be far more prevalent, with more than double this number of vehicles using cellular telematics systems for navigation, safety communication and more.

"Cellular connectivity will be only one modality for end-to-end cargo tracking," said research author James Moar. "It will be most common in many places as an aggregator of other signals, and as a backbone for transport infrastructure, with private cellular networks proliferating in warehouses, ports and other industry hubs." ■

ABI Research expects 1.1 billion ambient IoT device shipments in 2030

Ambient IoT describes a new class of connected devices that can harvest energy from virtually any available source in the device's surrounding environment. In recent years, an ecosystem of energy-harvesting component manufacturers has emerged, driving the growth of ambient-powered Internet of Things (IoT) devices. **ABI Research**, a global technology intelligence firm, forecasts that ambient IoT device shipments will reach 1.1 billion units in 2030.

"Innovation has been led by the designers of power generators, focusing on optimising techniques to convert ambient energy into usable energy, and by the designers of power management integrated circuits (PMICs), working to develop chips that can store harvested energy on the device in the most efficient way possible," explains Jonathan Budd, an industry analyst at ABI Research. "The specialised ecosystems for solar cells and

solar modules, piezoelectric harvesters, thermoelectric generators (TEGs), and radio frequency (RF) harvesters are enabling energy conversion from low light sources, low temperature gradients, as well as power-at-a-distance via radio signals."

The power generator designs of **Williot, Exeger, Energous, Epishine, Powercast, EnOcean** and **Ossia**, as well as those for PMICs from **e-peas** and **Nexperia**, are unlocking new applications across the IoT landscape for the use of reliable battery-free systems, as well as hybrid models for the combination of battery power and energy harvesting. In 2030, ABI Research projects photovoltaic (PV) harvesting to be the most common method of powering ambient IoT devices, accounting for 57% of device shipments, followed by RF harvesting with 36%, while piezoelectric and thermoelectric harvesting are expected to power 4% and 3% of Ambient IoT devices, respectively. ■



SenseNet and iez! partner to provide AI-based early wildfire detection in Brazil

SenseNet, a contributor in early wildfire detection, protection and management, and **iez! Telecom**, a supplier of telecoms infrastructure in Brazil have announced a partnership that provides an artificial intelligence (AI)-based solution to detect and prevent wildfires, particularly in large areas of vegetation throughout Brazil.

This partnership marks a global benchmark in the prevention and management of wildfires, as SenseNet's accurate and immediate wildfire detection solution will be powered by the advanced connectivity network provided by iez!. In Canada, the SenseNet system uses **Rogers'** 5G national network to provide ultra early wildfire detection to prevent wildfires to ensure a reduction in environmental and property damage in the more than two dozen communities where it is being deployed.

With a MESH communication network supported by an advanced private network deployed by iez!, SenseNet's technological solutions operate with the advanced integration of AI, high-precision long-range cameras and ground sensors with multiple layers of detection, such as changes in gases, temperature and humidity in the environment, providing data on initial forest fire outbreaks to predict and detect smoke signals – even at the smouldering stage – in less than a minute.



Hamed Noori, SenseNet

"We are very excited to partner with Brazil's leading telecommunications provider to provide the most technologically advanced and comprehensive ultra-early fire detection solution, adapted to Brazil's unique challenges with protecting rural, agricultural lands and municipalities," says Hamed Noori, the CEO and co-founder of SenseNet. "SenseNet's technology and the robustness of iez!'s 4G and 5G networks represent a significant advance in the fight against forest fires." ■

Honeywell modernises energy grid and utility management with Verizon 5G connectivity

Honeywell and **Verizon Business** have announced that Honeywell smart meters will now include Verizon 5G connectivity to allow both utilities and end users to remotely access essential data, better manage energy usage and resources, and streamline operations to help alleviate strain on the grid.

The Verizon-connected Honeywell smart meters provide utility companies with a highly reliable and secure cellular network capable of sending information about energy usage, grid conditions and equipment performance. This information can be fed into utility management platforms such as Honeywell Forge Performance+ for Utilities to deliver heightened operational visibility that will support energy insights, provide near real-time forecast of energy demand, and help improve grid reliability and resiliency.

"Put simply: secure, reliable connectivity in smart meters makes it easier to monitor the

usage of resources and the performance of utility equipment," said TJ Fox, the senior vice president of industrial Internet of Things (IoT) and automotive at Verizon Business. "That means we can reduce waste, unburden our grids, and generally take time and cost out of the utility management process. With massive changes on the horizon for utilities, connected capabilities are going to be critical for managing evolving demands for energy and minimising outages or unforeseen maintenance events."

Amol Motivala, the president of Honeywell Smart Energy, added: "By using the power of AI, cloud and 5G, we are driving the shift to autonomy for utilities and fundamentally changing the way energy distribution is managed by offering real time connectivity. Through Verizon 5G connectivity, we are reimagining the utility ecosystem with cellular connected smart meters that provide the needed insights to help improve grid performance and customer satisfaction." ■

News in Brief

Isuzu and Fujitsu ink software defined vehicles deal

Isuzu Motors and **Fujitsu** have announced the signing of a partnership agreement to strengthen the development of competitive software-defined vehicles (SDVs) for commercial mobility. Through the partnership, Isuzu and Fujitsu aim to solve issues in the logistics industry such as improving efficiency and achieving carbon neutrality. Using their respective strengths in commercial vehicles and digital technology, the companies will work on developing software update systems, fostering software talent, improving development efficiency, and strengthening the development infrastructure.

In October 2022, Isuzu and Fujitsu, through their jointly invested company **Transtron** launched GATEX, a commercial vehicle information platform providing advanced operation management and support services. Based on GATEX, Isuzu has provided its unique solutions for approximately 570,000 commercial vehicles, such as advanced genuine maintenance programme PREISM and telematics system MIMAMORI. ■



floLIVE and Helix Wireless global IoT connectivity transforms JetBlue's baggage experience and efficiency

As organisations rely on IoT to support critical processes and operations, the need for reliable global connectivity has never been more acute. Multi-national enterprises need to operate consistently across regions and countries, with clear information about performance-affecting connectivity challenges as well as complying with local regulations. Previous generation efforts, which typically revolved around a lead operator from a company's home market that partnered with local providers, were fragmented and complex. IoT users suffered from disjointed customer service and poor flexibility when it came to accessing the best available connectivity in each of their respective business locations.

For IoT organisations operating in multiple markets, even an hour of network downtime can cost thousands of dollars. The losses can multiply if the enterprise is at the mercy of an unreachable third-party carrier for restoration – as may be the case when these endpoints are seen as roaming from another carrier on a local network. To get the service they want in all the locations in which they operate, organisations are turning to new models for global IoT connectivity. By selecting specialist connectivity providers that are partnered with a global connectivity platform, IoT organisations can ensure that they receive not only the best available connectivity in each market but also benefit from unified customer care and timely communication of any service-affecting issues.

One successful example is a global implementation of back of house operations at JetBlue, a North American-based airline that operates domestically and globally. JetBlue has built on its existing relationship with Helix Wireless, a specialist provider of global IoT connectivity, and enterprise service enabler, to utilise embedded SIM (eSIM) technology to extend seamless connectivity to its international systems. The new service is delivered in partnership with floLIVE, operator of the world's largest cellular network for IoT. Using advanced multi-IMSI ►

SPONSORED INTERVIEW



Curtis Govan
president for the Americas
floLIVE



Mohammed Nabi
IT manager for Airport
Operations Programmes
JetBlue



John Squillace
founder and chief executive
Helix Wireless

and eSIM capabilities, floLIVE provides centrally managed local connectivity, low latency performance and full regulatory compliance for devices anywhere in the world.

George Malim, the managing editor of IoT Now, spoke to Mohammed Nabi, the IT manager for Airport Operations Programmes at JetBlue, John Squillace, the founder and chief executive of Helix Wireless, and Curtis Govan, the president for the Americas at floLIVE, to understand how IoT connectivity is supporting these global critical use cases

George Malim: What specific goals or operational improvements drove JetBlue's decision to invest significantly in IoT connectivity across its airport operations?

Mohammed Nabi: Our goal was to optimise ground operations, especially for baggage delivery, so we could achieve not only operational efficiencies but also improved customer experience. For us, that meant enhancing the entire baggage journey – from the moment a customer prints their label and scans their bag at the airport, to when they collect it at their destination.

To achieve this, we upgraded our entire baggage system infrastructure, integrating advanced scanners designed for real-time baggage tracking. This gave us the ability to capture and share updates at every stage of the process. Passengers now receive real-time notifications at key touchpoints – when their bag is checked in, loaded onto the aircraft, and arrives at its destination – providing transparency and peace of mind. On the operations side, this real-time data allows us to optimise workflows, reduce delays and improve flight turnaround times.

The previous hardware we used was very old and relied only on 3G connectivity, which was provided by a single carrier. A significant issue was that this carrier didn't have global coverage so while it was good in many locations, in some locations its local partners did not provide the reliability and quality we needed. They outsourced to a local provider and we were bound to them so, if there was an outage, their service level agreement (SLAs) often didn't align with our expectations. As a result, problem resolution took far longer than acceptable, putting our operations – and ultimately, our customer experience – at risk.

What we needed was seamless, reliable service, paired with proactive visibility into potential issues so we could respond quickly and avoid delays. That's why we turned to **Helix Wireless**, powered by

floLIVE's global connectivity infrastructure, which offered the flexibility, control, and consistency that our operations required.

GM: How is the Helix Wireless and floLIVE offering different to that of a major global cellular operator?

John Squillace: The first thing we do is take a comprehensive look at the problem the customer is trying to solve. Far too often solution providers will jump to the end and say that if you want cellular connectivity, all you have to do is use this SIM and it's going to work. But the reality on the ground is far more complex, and many of these providers lack true insight into what happens at each location.

We always start by listening to what the customer is trying to achieve – what their operational goals are, how those goals translate into their connectivity needs, and what's required to support that solution end-to-end. In floLIVE, we found a partner that shares our passion for technology and the same commitment to simplifying cellular connectivity, which, frankly, is anything but simple. Our shared mission is to remove that complexity and make it as easy as possible for our customers. A big part of providing resilient service in every location is enabled through floLIVE's local mobile network access to more than one carrier – avoiding the problem that JetBlue experienced with its legacy system.

One of the key differentiators in our **JetBlue** solution is simple and comprehensive control. With floLIVE's Connectivity Management Platform (CMP), we have real-time visibility and the ability to switch between mobile networks seamlessly, ensuring our customers always get the performance they need, wherever they are. But more importantly, our job is to be available whenever and wherever the customer needs us. That means being responsive, knowing what's happening in the network at all times, and keeping customers informed – ideally before any issue impacts their operations. ►



The flight delays caused by baggage issues that we used to get two and a half years ago have now gone down by 60-70%

The tenet of our partnership with floLIVE is that we are one team. This partnership allows us to know what's happening in the network, keep customers informed of issues, and to fix issues as quickly as possible. In addition, we provide customers like JetBlue with real-time visibility into the experiences being delivered and performance metrics such as latency and service quality.

Curtis Govan: It's not just about providing connectivity. Our partnership with Helix Wireless is about solving real business challenges together. Helix brings deep experience in enterprise IoT, especially in knowing how to tailor solutions for companies like JetBlue. We combine that with floLIVE's global core network and multi-IMSI technology to build solutions that fit each customer's exact needs.

Helix knows the right questions to ask – they don't just offer a standard solution, they get to the heart of what's needed to keep operations running smoothly. Together, we ensure real-time connectivity, seamless carrier switching and regulatory compliance across regions.

But more than that, we work closely together every step of the way. We share insights on network performance, solve issues fast and keep open communication – so customers like JetBlue can keep things running without surprises.

Today, best-effort connectivity isn't enough. Companies need real-time data, full control over their networks and always-on connectivity to maintain high service quality and avoid costly disruptions. That's exactly what we deliver – deep control over the entire stack, ensuring the performance, reliability, and uptime they count on.

JS: There's no shortcut to doing the hard work. We're able in some cases to go and test the connectivity. For example, we performed robust testing and support in Florida to ensure that if you

bring 250,000 extra people to the F1 Grand Prix in Miami, the network is going to work. We've spent the time getting the information from the hardware makers to ensure that our customers' solutions are definitely going to work. It's no good having people 13 hours apart in different time zones with partners getting advice from people who shouldn't be giving it.

GM: Mohammed, why did you choose Helix Wireless and floLIVE?

MN: Reliability and performance are the biggest factors for us. Our aircraft data teams had already been using Helix Wireless and we had heard a lot of good feedback from them. Support was also a major factor. The support we get from Helix Wireless has been very good and the speed of resolution has been fantastic, which greatly improves our operational performance.

The flight delays caused by baggage issues that we used to get two and a half years ago have now gone down by 60-70% because the service has improved. The technology is better and the reliability is great. In addition, airlines are always looking to improve cost efficiency and this solution helps us avoid substantial costs in our routine operations as well as reducing penalties and compensation payouts. I really appreciate notifications of planned maintenance ahead of time which enables us to go to manual processes in advance.

Don't forget, the stakes on the baggage side can be high. Any time we do not load all the bags on time, it results in a flight delay, and every delayed take-off causes a financial penalty to JetBlue. In addition, there is also compensation to be paid to any customer whose bags are left behind, so there is a substantial financial upside for optimising our operations and avoiding errors. Optimising these operations with Helix and floLIVE has delivered real operational and financial benefits for JetBlue. ►



GM: What have you learned about deploying in regulated, mission critical environments where the costs of failure can be measured in thousands of dollars per hour?

JS: It's not for the faint-hearted, that's for sure. In regulated, mission critical environments, failure comes at a real cost – sometimes thousands of dollars per hour. What we've learned is that you can't just hope things work – you have to build for failure and be ready for it.

That's why our solutions are rigorously tested and always include redundancy, especially through our smart SIM offerings. If one network has an issue, we can switch to another carrier seamlessly – because in these environments, you can't afford downtime.

And yes, Murphy's Law is real – something will eventually go wrong. But with the flexibility we've built into our solutions, we ensure that when it does, we're ready to adapt and keep things running smoothly for our customers.

GM: Curtis, are you seeing increased demand from sectors where downtime has a dollar value?

CG: Yes, 100%. We're seeing increases in demand from sectors where best effort is no longer enough. Companies like JetBlue operate in a highly competitive market and reliable connectivity gives them an edge over competitors. It's not just aviation. In industries like security and healthcare, where critical assets or life-saving medicines need to be tracked in real-time, downtime simply isn't an option. There is growing awareness across multiple industries of the harm caused by lost revenue or downgraded service caused by connectivity interruptions or high latency.

There is a strong need for resilient global connectivity. Where floLIVE is different from other IoT connectivity providers is that we own the entire technology stack, which lets us tailor solutions to fit each customer's exact needs. Instead of relying on one carrier, we provide access to two or more carriers, giving customers the flexibility to switch if needed to maintain connectivity. With our distributed core network, we can ensure low latency and consistent performance wherever our customers operate.

GM: Looking ahead, how is floLIVE preparing for the next wave of IoT requirements? Are there emerging technologies, regulations or trends that floLIVE is already addressing?

CG: It's a fascinating time in the IoT industry right now. We're seeing the second iteration of 3GPP innovation. The first was the introduction of LTE Cat-M and narrowband-IoT (NB-IoT) and now, the second wave encompasses integrated SIM (iSIM) and SGP.32. Those technologies will standardise shortly and provide a base for made-for-IoT connectivity which will take the marketplace away from the legacy approach of positioning IoT connectivity as a subset of consumer mobile technology.

We're not waiting for these standards to finalise. We've already moved ahead with enterprise projects involving iSIM, and we're actively working on SGP.32 solutions in advance of full

standardisation. We took a similar approach with our multi-IMSI solution, which has now been successfully deployed in the market for over a decade.

Technology in general is evolving and the sunset of 3G is coming. Our architecture is built so that if one network sunsets, customers can move to another. Partners like Helix Wireless are always looking ahead as well to ensure that they can continue to be trusted advisors to their customers. We're engaged in development for emerging network technologies such as 5G Red Cap as well and will be ready for adoption by customers and partners when the marketplace demands them.

Beyond cellular, we've integrated satellite connectivity into our offering, enabling reliable connections even in remote and hard-to-reach areas. This is a critical piece for global IoT deployments where terrestrial coverage may not be enough.

We also act as an aggregator, integrating our Connectivity Management Platform (CMP) with other connectivity platforms to give customers the flexibility to manage multiple connectivity ecosystems in one place. Whether they use floLIVE exclusively or alongside other CMPs, we make it easy to manage.

In addition, floLIVE supports voice over LTE (VoLTE) for IoT use cases that require voice services, and through our MVNE offering, we help partners and enterprises launch their own IoT connectivity solutions, leveraging our global infrastructure to speed product to market without the burden of building from scratch.

This approach ensures that our customers stay flexible, future-ready and always connected – no matter where their devices are deployed or how the market evolves.

GM: Mohammed, to conclude please can you provide an example of how JetBlue has been able to improve processes and achieve its goals thanks to the Helix Wireless and floLIVE solution?

MN: From the operations side, the technology has made the processing of bags much simpler. The feedback we are receiving from our international cities is amazing. My team was involved in adding St Croix in the Caribbean as a new station just before Christmas and everything was a breeze, taking only a week to set up with the Helix Wireless team. From testing to training and first response, the team's feedback was: "Wow, this is quick."

For the inaugural flight we had 100 bags to be handled. Normally, that would take 15 to 20 minutes, but with this setup, we managed it in 10 minutes. That level of efficiency doesn't just improve operations – it boosts crew morale because they have tools that work and processes that flow smoothly.

Meanwhile, on the customer side, the baggage journey the customer experiences is enhanced. They have the confidence that their bag is on the plane and they will get it at their destination. Finally, when they know the bag is on the plane, we also know there will be no penalties, no compensation and no dissatisfaction. ■

Technology in general is evolving and the sunset of 3G is coming



How The Aroma Trace crafted consistent scent experiences through global IoT connectivity

The Aroma Trace is a global innovator in scent marketing, pioneering olfactory branding to enhance emotional connection and brand loyalty. With offices in 12 countries and a presence in more than 47 countries through franchises and distributors, its operations span a vast international footprint. The Aroma Trace’s signature scent diffusion systems can be found in luxury hotels, retail chains, corporate offices, healthcare centres and premium car dealerships around the world – delivering immersive, memory-triggering experiences at every location.

To achieve this, The Aroma Trace depends on a network of connected scent diffusers – each requiring seamless, reliable global cellular connectivity to ensure consistency, uptime and precise remote management



The business impact of floLIVE

- Cut connectivity costs by over 50% by switching to usage-based billing and eliminating charges for inactive SIMs.
- Achieved seamless cross-border device performance, resolving critical downtime issues experienced with the previous provider.
- Improved operational efficiency through real-time device monitoring, reducing manual checks and emergency field visits.

Without timely alerts, the team couldn't detect or resolve issues early

The Aroma Trace relies on the ability to remotely monitor, control and optimise hundreds of scent diffusers around the world. These smart devices must always be connected – ready to send real-time alerts about scent levels, device tampering, unplugging or any technical malfunctions.

With its previous IoT service provider, The Aroma Trace quickly encountered limitations that disrupted operations and put client satisfaction at risk. These included:

- **Inconsistent cross-border connectivity:** Devices that worked reliably in one region, such as Spain, would often lose connectivity when deployed in other countries – undermining visibility and service continuity.
- **High costs for inactive SIMs:** The pricing model charged for every SIM, active or not – driving up

connectivity costs and making it difficult to scale in a cost-effective way.

- **Lack of real-time operational insight:** Without timely alerts, the team couldn't detect or resolve issues early – leading to missed refills, unplanned outages and potential loss of high-value contracts. In many cases, the team had to dispatch costly emergency site visits just to maintain service continuity.
- **Manual fragmented operations:** The absence of centralised control made inventory tracking, troubleshooting and reporting complex and reactive – increasing operational overhead and limiting agility

To address the limitations of its previous IoT service provider, The Aroma Trace turned to floLIVE for a more reliable, scalable and transparent solution. floLIVE's cloud-native ▶

SPONSORED CASE STUDY



Unlike the legacy model, floLIVE charges only for active endpoints and actual data consumption, significantly reducing connectivity costs

connectivity platform offered global coverage with local compliance – all through a single SIM and a unified management layer.

With floLIVE, The Aroma Trace gained:

Seamless global connectivity

floLIVE’s distributed core network and vast IMSI library enabled consistent performance across countries, removing roaming limitations and minimising latency.

A pay-as-you-grow billing model

Unlike the legacy model, floLIVE charges only for active endpoints and actual data consumption, significantly reducing connectivity costs.

Full device visibility and alerts

From a single dashboard, the team could remotely monitor device performance, receive automated alerts and trigger proactive responses – ensuring consistent customer experiences.

Enhanced service reliability

floLIVE’s autonomous network switching minimised downtime, while data remained in-region, meeting all compliance and security standards.

“Downtime is more than just a technical issue – it directly affects our service quality and reputation,” explains Stefano Iannini, the chief executive for USA and Canada at The Aroma Trace. “When connectivity drops, we lose real-time visibility into

our smart scent diffusers, which leads to missed alerts, service failures and client dissatisfaction – especially in premium environments where expectations are sky-high.”

Reduced costs, increased uptime

With floLIVE, The Aroma Trace was able to:

- **Cut connectivity costs by more than 50%:** eliminating charges for idle SIMs and removing overage penalties.
- **Achieve seamless global connectivity:** devices now stay connected regardless of location – enabling consistent service delivery in every market without the need for manual network switching or troubleshooting.
- **Reduce field visits and manual interventions:** real-time visibility into device status has allowed the team to resolve issues remotely and proactively – reducing costly site visits and improving service response times.
- **Protect its brand reputation:** ensuring premium customers always receive the consistent, signature experience they expect.

“floLIVE solved our cross-border connectivity issues and finally gave us a pricing model that makes sense – only charging for active endpoints and consumed data, not idle SIMs,” concludes Iannini. ■



www.flolive.net

TRANSFORMA INSIGHTS

Global Advisors on IoT, AI and Digital Transformation

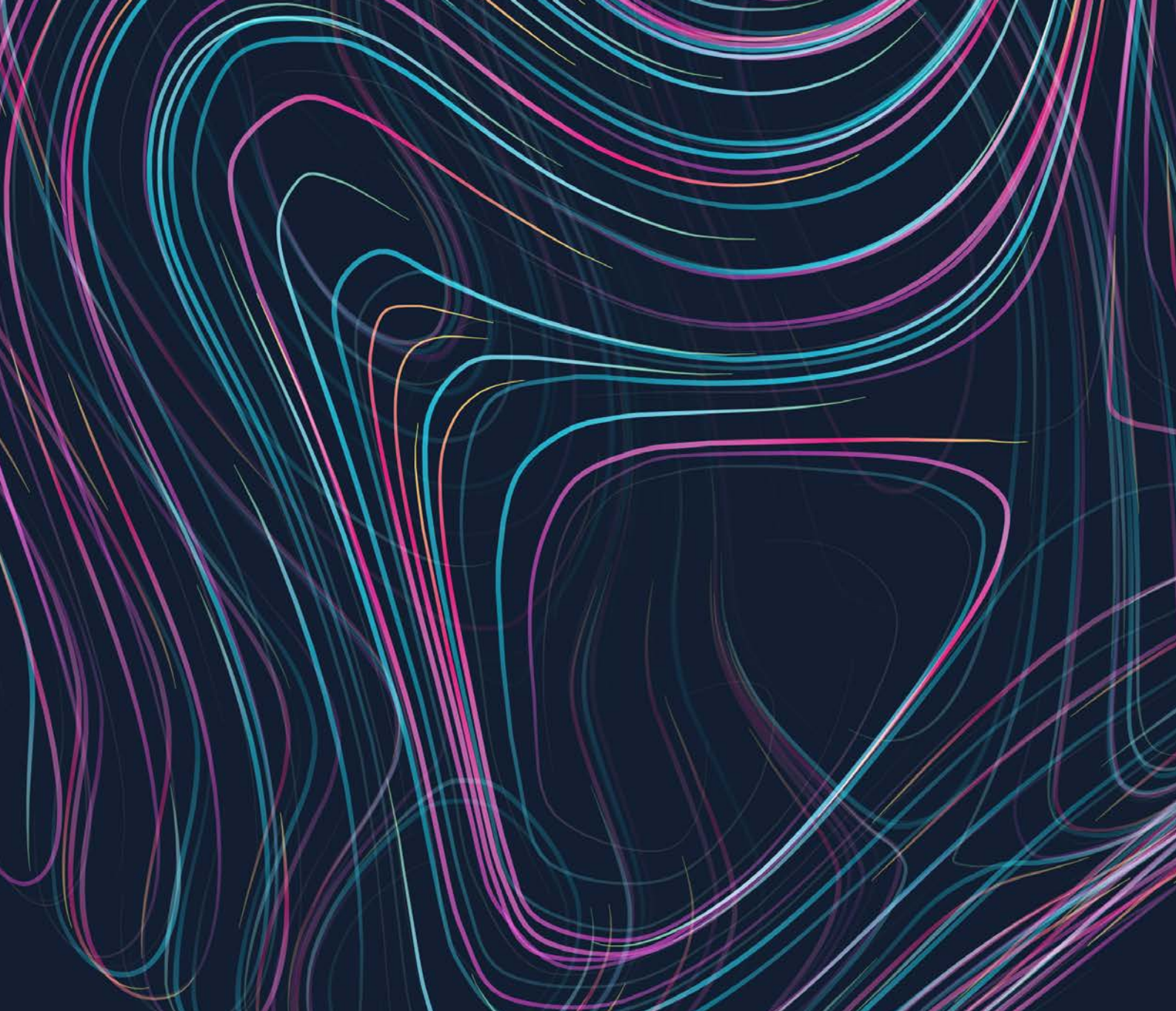
Every year Transforma Insights publishes its list of IoT 'Transition Topics' highlighting where we expect to see seismic change occurring during the year. This year the list focuses on the application of Artificial Intelligence to IoT, network technology transitions, changing commercial dynamics and the growing impact of IoT regulations.

Transforma Insights 2025 IoT Transition Topics

AIoT	Management and orchestration of Distributed AI
eSIM orchestration vs connectivity reseller	Monetising 5G (particularly SA) with IoT
Decision points and pivots in support for LTE, NB-IoT and public LoRaWAN	Satellite IoT and likely disruption
Impact of regulations on delivering IoT solutions	Geopolitics and polarisation of markets
Verticalisation of IoT	Market segmentation, channels and partner programmes

To learn more about the Transition Topics, you can find more details in our press release: transformainsights.com/news/transition-topics-2025

The Transition Topics will form the basis of a significant part of the research agenda for the Transforma Insights Advisory Service in 2025, as well as sponsored Position Papers and Virtual Briefings. To learn more about our 2025 Research Agenda, or to discuss sponsorship opportunities, please contact us at enquiries@transformainsights.com



IoT and mobile operators: progress and pain points

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IoT and its challenges for mobile network operators

The Internet of Things (IoT) market is expanding rapidly, as enterprises prioritise digital transformation, writes Christina Patsioura, the lead analyst for IoT & Enterprise Research at GSMA Intelligence, in this report which has been authored by GSMA Intelligence with support from floLIVE. However, mobile operators are struggling to translate this growth into sustainable revenue, as IoT connectivity alone is becoming increasingly commoditised

Challenges for mobile operators include the following:

- **Declining connectivity revenues.** Intense competition from mobile virtual network operators (MVNOs), hyperscalers and IoT service providers is driving down margins, making it difficult for mobile operators to differentiate their offerings.
- **Enterprise churn and value creation.** Operators must evolve beyond basic connectivity as enterprises demand security, integration and multi-country network consistency.
- **Complexity of global coverage.** With 38% of enterprises requiring IoT deployments across multiple continents, traditional roaming models are insufficient, requiring new connectivity frameworks.
- **An investment dilemma around 5G RedCap and legacy support.** While enterprises seek future-proof, low-power IoT solutions, many existing IoT connections still rely on legacy 4G, LPWA and even 2G/3G networks.
- **Enterprise IoT adoption barriers.** Cost of implementation, security concerns and technology integration challenges remain key obstacles hindering IoT deployments at scale.

To capture value beyond connectivity, leading operators are pursuing three core strategies:

- **Developing vertical-specific solutions** – Focusing on high-growth sectors such as automotive and utilities.
- **Deploying cloud-native IoT platforms** – Enabling scalable, API-driven integrations for enterprise customers.
- **Forming strategic partnerships** – Collaborating with hyperscalers, systems integrators and IoT solution providers to enhance service offerings.

The challenges above have created a limited market for operator-led IoT, prompting them to rethink their IoT strategies. To succeed, operators must understand the specific hurdles faced by enterprise adopters. GSMA Intelligence's Global Digital Transformation Survey highlights the key obstacles among potential adopters: high implementation costs, security concerns, difficulties integrating with existing systems, and a lack of in-house expertise. Operators can play a vital role in helping enterprises overcome these barriers. To do so, operators must have the right talent and business resources, together with a modern, purpose-built, IoT technology stack. ▶



IoT has come a long way

Mobile operators have played a critical role in shaping the IoT landscape, evolving from machine-to-machine (M2M) pioneers to key enablers of the connected world. As IoT adoption accelerates, operators face a growing challenge in delivering seamless, cost-effective and scalable connectivity.

This report delves into the biggest pain points encountered by operators, including global connectivity management, regulatory compliance, security concerns and monetisation strategies. By understanding the challenges, operators can refine their strategies and position themselves for long-term success in the evolving IoT ecosystem.

Evolution to key enablers of the connected world

2000–2010: The M2M era

Mobile operators began their journey by exploring M2M communication, focusing on industrial and telematics applications. In its early days, the potential of M2M communication was not widely recognised. However, several forward-thinking mobile operators invested heavily in developing proprietary platforms to support M2M services, or relied on third-party monolithic platforms, laying the foundation for what would later evolve into IoT.

2010–2019: IoT proliferation

Realising the vast potential of IoT, operators intensified their investments and defined the role of mobile networks in the ecosystem.

This period saw the proliferation of IoT-driven applications, such as telematics powering usage-based insurance, and smart meters modernising national utilities. The convergence of IoT with digital technologies and cloud platforms unlocked new opportunities. IoT became a central pillar of 5G's future vision.

2020 to present: A dynamic IoT market

As IoT matures, the market is experiencing rapid growth and consolidation, particularly in areas such as connectivity services, equipment, and management platforms. At the same time, operators face challenges in monetising certain IoT use cases. As a result, the total addressable market for operator-led IoT is being constrained – both at the lower end, where smaller use cases struggle to scale profitably, and at the higher end, where cross-border IoT deployments require more advanced solutions. In response, some operators are re-evaluating their IoT strategies, reassessing their role in the value chain and exploring new business models to sustain competitiveness.

New entrants are also entering the IoT space, making use of advancements in technology and the groundwork laid by early adopters to offer innovative solutions and capture emerging market opportunities.

Plans for IoT among mobile operators

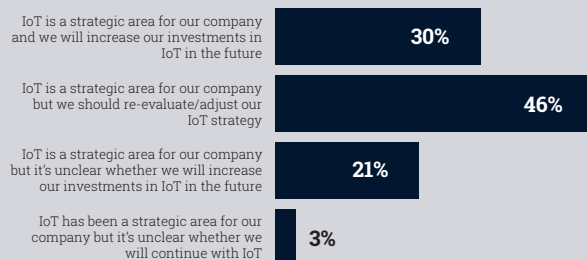
Half of operators are looking to re-evaluate plans

Based on GSMA Intelligence tracking of operator plans for IoT, **Figure 1** outlines how operators view their future:

- About a third are confident in their strategic choice to be in IoT and intend to keep investing in it in the future.
- Almost half think they should re-evaluate their strategies, despite being confident in their choice to be active in IoT.
- Around one in four appear less confident about continuing to invest in IoT or even continuing to offer it. ▶

Figure 1: Around half of operators are looking to adjust their IoT plans

How would you summarise your view and your plans for IoT? Percentage of respondents



Source: GSMA Intelligence Operators in Focus: Enterprise Opportunity Survey, December 2023



IoT challenges for mobile operators

Profitability of IoT connectivity

After about a decade in IoT, just over half of operators globally still offer connectivity-centric IoT. The rest have moved to services beyond connectivity. Overall, average revenue per user (ARPU) from IoT connectivity has been falling, with offerings as low as €1 per year (ARPU levels will depend on the market, application and operator).

Competition from MVNOs and IoT service providers is growing. Combined with typically high levels of network costs for operators, this has led to suppressed profit margins in IoT connectivity. As such, mobile operators offering IoT need to take advantage of any possible efficiencies in their technology stack (which often relies on legacy infrastructure) to bring their cost structure to lower levels.

Figure 2: More than half of operators still offer connectivity-centric IoT

Which technologies are part of your IoT offering?
Base: those network operators offering IoT services (from a total of 100)



Connectivity-centric IoT includes cellular connectivity (such as NB-IoT, LTE-M and RedCap) and non-cellular technologies (such as LoRaWAN or Wi-Fi). Includes operators with their own connectivity management platform.

Beyond connectivity IoT includes software application platforms, either operator-owned or via third parties, and integration services, in addition to IoT connectivity.

Source: GSMA Intelligence Operators in Focus: Enterprise Opportunity Survey, December 2023

Growing and retaining customers

While pursuing high-volume connection targets to combat declining ARPU, mobile operators are struggling to effectively serve customers with different needs and profiles. Specifically, their infrastructure and operations are not optimised for small IoT deployments, while a lack of global reach restricts their ability to support large international rollouts of IoT. This misalignment between operator capabilities and the needs of the market can lead to customer dissatisfaction and/or increased churn, ultimately constraining growth of market share.

Providing seamless IoT connectivity wherever needed

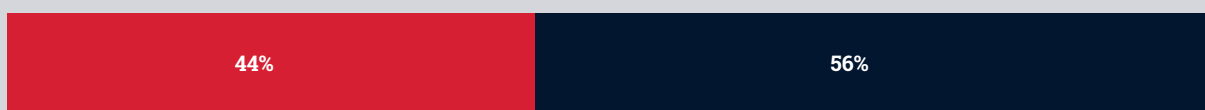
Mobile operators have traditionally focused on their home networks. With the rise of modern IoT use cases, operators are struggling to provide the same level of service outside their domestic footprints and in international markets. To service multi-country deployments, operators rely on roaming agreements with partner operators. However, these agreements may fall short in scenarios affected by privacy laws such as GDPR in Europe, or in countries that do not allow permanent roaming, such as Türkiye, Brazil and UAE.

Even in their own markets, operators could struggle to provide nationwide coverage. As an example, use cases in utilities, such as electricity meters, require nationwide coverage – yet most operators cover 80–90% of the required service area. Such limitations create significant challenges for operators aiming to support large-scale IoT deployments that need seamless connectivity. ▶

Figure 3: Enterprise adopters of IoT have highly diverse needs in terms of coverage

What are the network coverage requirements of your company's IoT deployments?

Percentage of enterprises. Base: those using, testing or planning to invest in IoT across a base of 4,200 enterprises, from 10 vertical sectors, with operations in 21 countries.



A single geographical area in a country
A city, district or limited area or a specific location such as a campus or factory

Other options
Coverage across multiple countries or continents

Source: GSMA Intelligence Enterprise in Focus: Global Digital Transformation Survey 2024



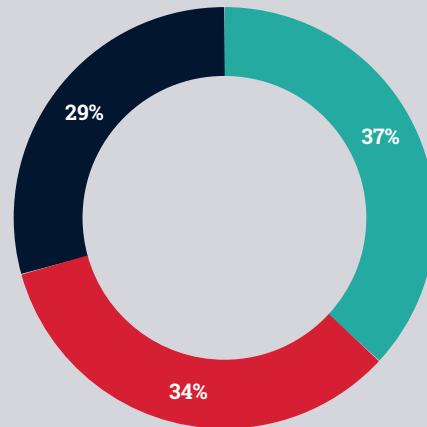
Integrating new technologies

The IoT landscape is evolving rapidly, presenting both opportunities and challenges for operators. Emerging technologies such as 5G RedCap and 5G NTN (satellite IoT) require major investments, while previous networks (2G, 3G, 4G-based IoT) still require support. Operators must balance innovation with backward compatibility.

Meanwhile, new standards such as eSIM SGP.32 are reshaping traditional customer retention models. The ability to switch operators over the air (OTA), without the need to 'touch' the device, could increase customer churn. To stay competitive, operators need to embrace these changes, realise the opportunity to unlock new revenues and fully harness the potential of IoT.

Figure 4: New SIM technologies gain ground
Percentage of global IoT connections using technology, 2030

Thinking about the global cellular IoT market (for example, the number of IoT devices/connections that use cellular networks such as 2G/3G/4G/5G or LPWA technologies), in your opinion what share of the total global number of IoT connections will be using eSIM or integrated SIM (iSIM) technology?



Source: GSMA Intelligence Operators in Focus: Enterprise Opportunity Survey December 2023

How operators can achieve success in IoT

Operators need a fit-for-purpose IoT connectivity stack

As with all IoT businesses, in order to succeed, operators need talented staff to build robust systems and design customised solutions. Management prowess is also essential to ensure the right opportunities are pursued.

Specific to operator success in IoT is having in place the right network assets in combination with business resources (summarised in **Figure 5**).

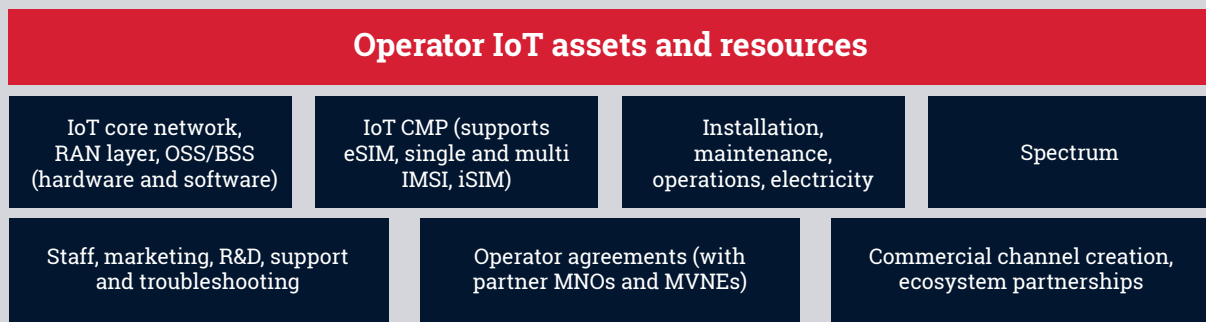
The business resources critical to operator success

include superior customer support, effective creation of commercial channels, ability to craft agreements with other operators (such as for roaming), and the ability to extend market reach through reselling network resources to mobile virtual network enabler (MVNE) partners.

Network assets (including the IoT core, RAN layer and billing system) should be fit-for-purpose, allowing operators to make best use of other, existing systems and enabling future integration of technologies.

To remain competitive and serve low-ARPU IoT use cases, operators also need to provide potential customers with self-service tools for onboarding and bill troubleshooting. ▶

Figure 5: Operator assets and resources required to deliver IoT



Source: GSMA Intelligence



The importance of the connectivity management platform

An essential component of an operator’s IoT stack is a connectivity management platform (CMP), which allows connection (SIM) provisioning, authentication and security. Some operators opt to build their own CMP, which typically requires significant investment to modernise legacy systems. Others opt for partner solutions. A mix of both options is also common, especially in cases where there are particular customer needs to fulfill.

The CMP acts as an abstraction layer on top of operator network systems. It is a core asset that helps operators design and manage the solutions they bring to market. The CMP directly impacts the value an operator can offer customers.

As the CMP directly affects the ability of operators to service all targeted markets and applications, its importance is heightened in a market challenged by connectivity technology fragmentation and operational challenges.

In addition to the CMP, further critical factors in terms of an operator’s IoT network assets are summarised in **Table 1**.

Table 1: Critical factors for fit-for-purpose IoT network assets

Factor	Implications
Uninterrupted, seamless, global coverage (including compliance and QoS)	<ul style="list-style-type: none"> • Customers need continuous connectivity across regions. • Compliance with roaming and privacy rules prevents service disruption. • Customers can receive alerts in real-time. • End users and other third parties involved can experience fewer disputes and fines.
A modern, scalable, cloud-based IoT core network platform	<ul style="list-style-type: none"> • Customers require a scalable solution for global IoT expansion. • Cloud-based platforms ensure reliability and easy integration. • Automation and self-service reduce operational complexity. • Strong security and compliance are essential.
Real-time visibility and control of connections across all areas of operation, with the ability to monitor data use and craft detailed customer-usage profiles	<ul style="list-style-type: none"> • Customers need real-time monitoring to manage costs and prevent fraud. • Usage analytics enables optimisation and proactive decision-making. • Dynamic SIM management improves coverage and cost efficiency. • Custom alerts help maintain uptime and security.

Source: GSMA Intelligence



Understanding IoT adopters: The voice of the enterprise

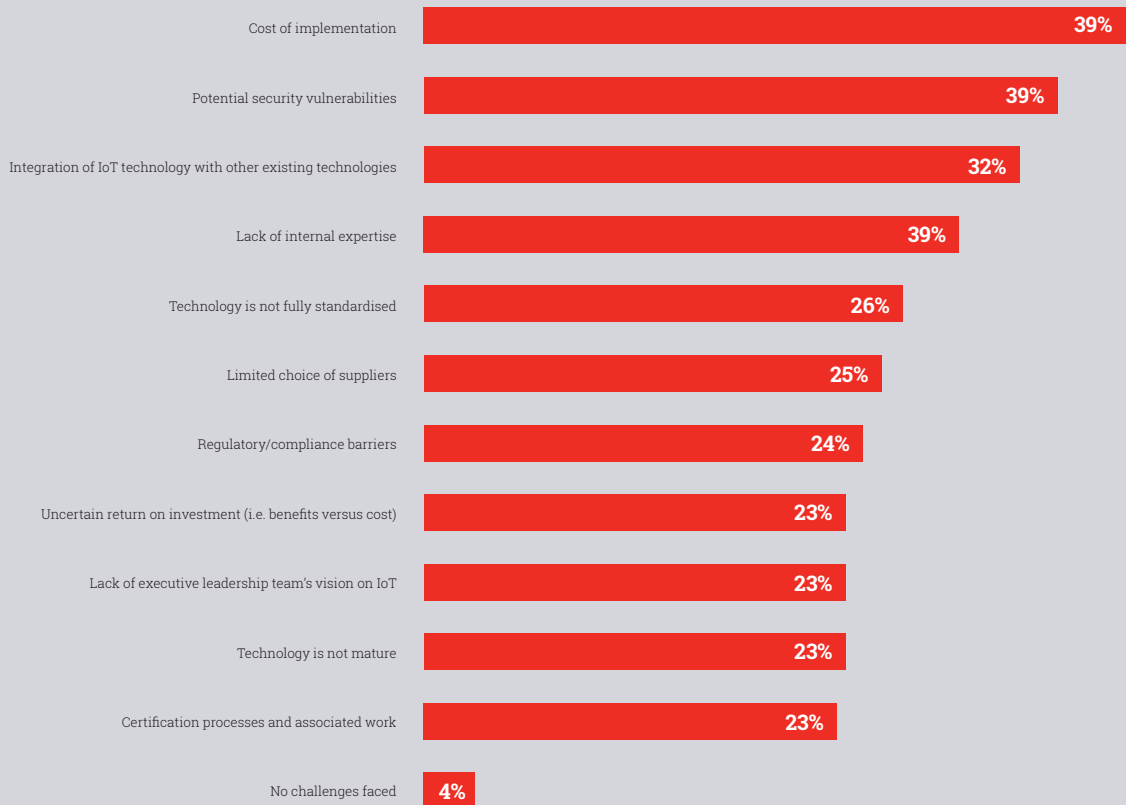
The operator role is key to facilitating adoption

To understand the views of enterprise adopters of IoT, GSMA Intelligence ran an extensive study with 4,200 enterprise buyers of digital and communication technologies at the end of 2024. The study covered enterprises from a number of verticals, from 21 countries across all regions.

Among enterprise adopters of IoT, cost of implementation was identified as the major deployment challenge. Meanwhile, security vulnerabilities and integration with existing systems were selected by around one in three respondents, and lack of internal expertise ranked as the fourth most important challenge. ▶

Figure 6: A range of challenges hinder IoT deployments

What are the IoT deployment challenges your company has faced or currently faces when deploying IoT technology?



Source: GSMA Intelligence Global Digital Transformation Survey

While operators are just one of many suppliers of IoT solutions to enterprises, their contribution is critical to facilitating IoT adoption.

Table 2 presents some of the standard practices among operators, and how these can have an impact on the challenges faced by enterprise IoT buyers. ▶



Table 2: How operators can help enable IoT deployments

Challenge to deploying IoT	Practices among operators	Adjustment required
<p>Cost of implementation</p>	<ul style="list-style-type: none"> Some operators require an IoT customer to commit to a minimum number of connections. However, this is inflexible and not suited to IoT, where deployments dynamically scale up and down in size. Some operators charge customers when the SIM is shipped, instead of when the connected device is activated (the period until activation could be up to 12 months). IoT customers operating in multiple countries may face unexpected roaming charges or lack support navigating local, data-related restrictions. 	<ul style="list-style-type: none"> Enable pricing of IoT based on customer data and service usage. Charge only when SIMs are activated. Ensure visibility of connections across any area and network of operation and troubleshoot effectively. Help customers navigate roaming and SIM options and align them with their needs and budgets.
<p>Potential security vulnerabilities</p>	<ul style="list-style-type: none"> Security vulnerabilities may lie away from the network, in the device and application levels, but can still cause damage. IoT customers need improved visibility and control of their IoT connections and may not be able to receive alerts quickly enough for security incidents. 	<ul style="list-style-type: none"> Procure secure platforms and invest in security capabilities for the IoT stack. Support VPN across multiple networks. Support custom access point name (APN) across multiple networks. Coordinate and cooperate with other IoT solution partners.
<p>Integration of IoT with existing technologies</p>	<ul style="list-style-type: none"> In most cases, integration with existing systems is the expertise of systems integrators, rather than operators. However, even connectivity solutions can require tailoring before handover. Limited ownership and control of the customer relationship can lead to poor customer service. 	<ul style="list-style-type: none"> Enhance customer-support functions and enable customer feedback mechanisms and remote monitoring of IoT project progress. Allow API integration with customer systems. Establish systems integrator partnerships or develop such capabilities.
<p>Lack of internal expertise</p>	<ul style="list-style-type: none"> Other IoT solution components may fall outside the remit of operators but can still affect the overall customer experience regarding connectivity service. Operators could be asked to assist customers with choosing connectivity modules or operating large fleets of devices. 	<ul style="list-style-type: none"> Develop a good understanding of device and module aspects to optimise for connectivity service. Provide customers with SIM/ device testing labs prior to deployment.

Source: GSMA Intelligence



The case for IoT deployments in automotive and utilities

Addressing vertical-specific needs

While the most significant IoT deployment challenges are common across industries, certain verticals have particular requirements that must be addressed too. These include the automotive and utilities sectors.

Both sectors require seamless domestic and global coverage, consistent service quality and simplified connectivity management. These are challenges that can exceed the capabilities of traditional operator models.

The automotive sector (encompassing vehicle manufacturers and sellers, as well as fleet operators) has critical requirements related to IoT, including:

- **seamless cross-border connectivity** – to ensure uninterrupted vehicle operation across different regions

- **real-time telematics and diagnostics** – to enhance vehicle performance, safety and predictive maintenance
- **OTA software updates** – to improve functionality, security and compliance with evolving regulations.

Meanwhile, for utility companies managing large-scale smart-metering deployments, IoT connectivity needs to support:

- **multi-regional smart meter deployments** – to ensure efficient and standardised data collection across locations
- **cross-border grid management** – to maintain operational stability and energy distribution efficiency
- **remote asset monitoring** – to enhance predictive maintenance and reduce operational costs
- **critical infrastructure management and regulatory compliance** – to meet industry standards and government regulations.

Customer scenarios for IoT operators

Scenario 1: Car manufacturer looks to ensure a unified experience across Germany and the US

A German car manufacturer provides connected vehicles that operate in multiple countries, including the US. The cars rely on seamless IoT connectivity for tracking, telematics, emergency assistance and infotainment. The manufacturer partners with a German mobile operator, which extends service abroad through roaming agreements with local mobile operators.

Car manufacturer challenges

- **Compliance with cross-border data transfer regulation.** Regulations regarding cross-border data transfers may pose restrictions on the storage and processing of data outside the borders of a country. For the car manufacturer, complying with GDPR is mandatory even when the cars operate in the US. Compliance with relevant US regulations is also a factor (for example, the California Consumer Privacy Act). Complying with different regulations adds complexity, while requirements such as sending the data back to Germany can cause delays and interruptions in IoT service.
- **Compliance with roaming rules.** IoT connectivity relies on roaming or permanent roaming (where a SIM card from one country is used to provide connectivity in another country on a long-

term basis). However, some jurisdictions can require local network agreements or impose restrictions on long-term use. While multi-IMSI and eSIM offer a solution to this challenge, they may not always be available from the operators or may not be compatible with the needs of car manufacturers.

- **Operational complexity.** The operator, based in Germany, must establish multiple roaming agreements with US operators to ensure nationwide coverage (as no single provider covers the entire country), or it may have to use local data centres for compliance. The car manufacturer must also certify its vehicles to meet US safety and environmental standards, often requiring operator support. Meanwhile, ensuring the onboard cellular device does not interfere with other spectrum users requires coordination with local spectrum authorities to prevent conflicts and optimise the use of radio frequency. ►



- **Consistent service quality.**
Relying on US partner networks reduces the German operator's visibility and control of service levels. Limited access to network logs and signalling can slow troubleshooting, making issue resolution dependent on US operators and potentially frustrating the car manufacturer.
- **Automotive-specific functions.**
Supporting functions such as eCall, telematics and infotainment across different countries requires consistent service and control of key features, to ensure minimal latency and no network service degradation, regardless of where the car is operating and the network used at the time.

IoT operator requirements

- **Regulatory compliance.**
The US and Germany have different data regulations. Ideally, the German operator would terminate data in the US while remaining compliant with local and EU laws. In Germany, data must stay within the EU. However, when a car moves to the US, personal data

is effectively transferred and must still be sent back to Germany for compliance.

- **Service level commitments.**
The car manufacturer expects consistent service quality (coverage, security, authentication, network speeds) in both Germany and the US. The German operator must uphold uniform servicelevel agreements regardless of location, to maintain customer satisfaction.
- **Profitability.**
Roaming agreements with multiple US operators increase costs for troubleshooting and service support, impacting profitability. Multi-IMSI SIMs can help, but the German operator would still depend on US-based partners for issue resolution. A local SIM (local IMSI) pricing model is more cost-effective for both the operator and the car manufacturer.
- **Flexible pricing.**
Both the German operator and car manufacturer need adaptable pricing models. Some IoT operators require enterprises to commit to a minimum number of SIM connections, but customised pricing structures may offer better business opportunities.

Table 3: Success metrics and KPIs

Roaming costs	Roaming entails added costs for both the car manufacturer and the IoT operator due to operational delays. The use of local IMSIs can lead to a reduction in the cost of roaming.
Deployment time	This should be reduced as much as possible. Completing local core integrations typically takes from a few weeks to a few months and should ideally be done within 4–6 weeks.
Latency	Optimum levels are determined by the use case – but, in general, latency should be minimised. Achieving sub-100 ms latency through local breakout points is possible.
Customer satisfaction	Customer satisfaction can be measured using a Net Promoter Score (NPS) on a scale of 0 to 10 (or 0% to 100%), reflecting the likelihood of customers recommending the service. A score of 9 or 10 is the target. Additional metrics to consider include the number of complaints regarding coverage issues and time spent on troubleshooting.
Uptime and performance	This measures adherence to service levels. The target should be to have few service interruptions and minimal downtime.

Source: GSMA Intelligence

Scenario 2: Automotive service provider looks to support VoLTE and eSIM

An automotive service provider (ASP) offers telematics, infotainment and connectivity-enabled hardware to automotive companies. It aims to expand its services globally, providing data as well as voice, including VoLTE for emergency calls and in-car assistant services. It also offers eSIM and seeks to avoid being locked into specific mobile operators – though still looks to maintain partnerships with them.

ASP challenges

- **Coverage** in all areas of operation. Even where the ASP relies on one mobile operator for connectivity service within a country, the operator might not offer sufficient coverage across all areas needed. This issue is further exacerbated when the ASP needs to service

multiple countries. Essentially, they would have to be customers of all the operators involved

- **Availability of automotive-specific services.** Lack of network coverage is not the only issue for the ASP; they need to ensure the mobile operators they are buying connectivity from also offer the required eSIM and voice services. Specifically, the operator needs to support the new eSIM standard SGP.32 for IoT, and at the same time offer IoT for emergency calls (typically mandated by regulations) and in-car assistant services.
- **Complex billing.** In a connected car, telematics, voice calls, emergency calls and infotainment are different services with different usage needs, in the form of data, messages and voice, and pricing. Ideally, the ASP would be able to bill and invoice all services accurately in a simple way. Typically, operator billing systems are not supportive of flexible IoT pricing models, and accurate billing is particularly challenging when dealing with multiple mobile operators. ▶



ASP requirements

Telematics and data collection

- Real-time monitoring of vehicle diagnostics and predictive maintenance.
- Secure transmission of performance data to cloud infrastructure.
- High-bandwidth connectivity for OTA updates.

Infotainment and digital services

- High-speed internet access for navigation, music streaming and communication.
- Seamless integration with smartphones and personal devices.
- Dedicated connectivity for in-car app ecosystems.

Security and privacy

- End-to-end encryption for vehicle data security.
- Secure network access for software updates and systems integration.
- Compliance with global standards for automotive cybersecurity.

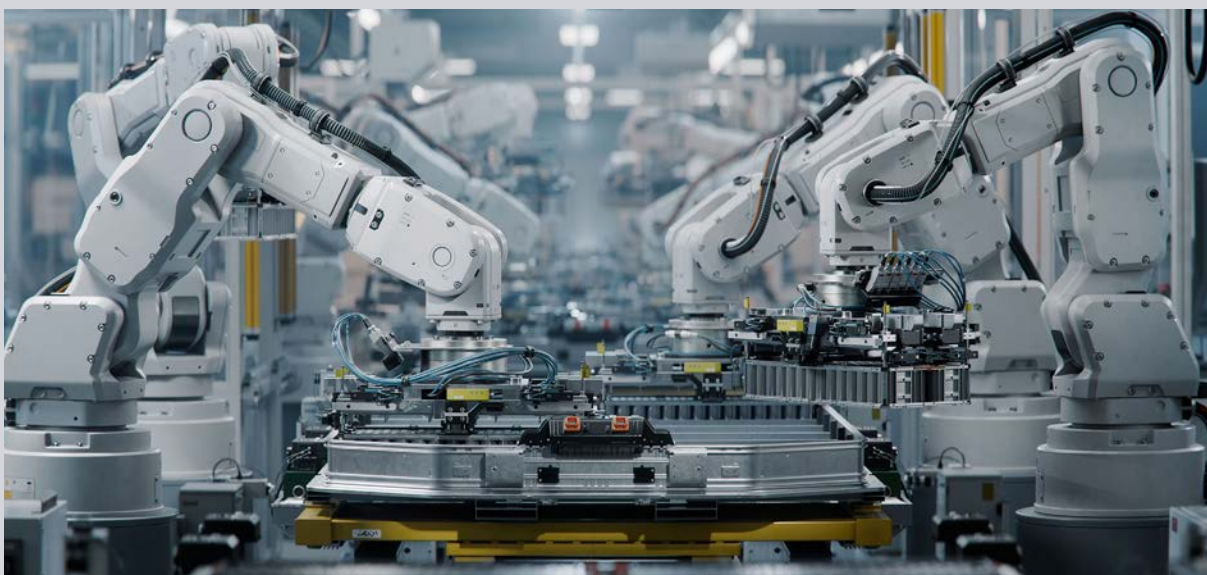
IoT operator requirements

- **Seamless global connectivity.** The mobile operator (with the ASP as its customer) needs to be able to offer global connectivity through a combination of the following: roaming agreements with certain mobile operators; use of local networks and local SIM profiles where roaming is cumbersome or costly; and potential use of eSIM services, specifically multi-IMSI support on eUICC (standards SGP.22 and SGP.32). To best manage these technologies, a 'single pane of glass' CMP aggregating platform is needed.
- **Integrated services.** The mobile operator needs to have an integrated solution for voice services (ideally supporting VoLTE).
- **Accurate billing across services and networks.** The mobile operator should be responsible for the billing of all services. To do this, it should have split billing between the different service providers (for infotainment, eCall, telematics) and be able to monitor use of the network in real-time, regardless of geography. ▶

Table 4: Success metrics and KPIs

Integration time	This refers to the time needed to integrate with the various operator networks, which should be as short as possible. Where different operators use different connectivity management platforms, API integration is needed for them to be managed centrally.
Lead time	Lead time refers to the period of deployment until connectivity is delivered/provisioned. It should be reduced as much as possible. It is significantly affected by the time needed for integration with other networks.
Billing accuracy	If billing is not accurate, issues can emerge for the mobile operator, ASP and automotive client. These include overcharges, missed payments, lower levels of customer satisfaction and customer churn.
Longevity of the solution	For the ASP, it is important to avoid operator lock-in and be able to offer all relevant services (voice, data, telematics, infotainment). Ease of management of the processes involved is critical to ensure longevity.

Source: GSMA Intelligence





Bayobab: a customer case study from floLIVE

Background

The rapid growth of IoT adoption in Africa and the Middle East has created an urgent demand for seamless, scalable and compliant connectivity solutions. MNOs and MVNOs are increasingly looking for innovative partnerships to expand their IoT capabilities and unlock new revenue streams.

Bayobab, a wholly-owned subsidiary of **MTN Group**, is a leading pan-African digital connectivity provider focused on bridging the region's digital divide through strategic infrastructure investments. With 83% of its planned 135,000-kilometre fibre network already deployed, Bayobab plays a critical role in enabling IoT expansion across Africa and beyond.

Bayobab and **floLIVE** share a deep understanding of the unique connectivity challenges in Africa. Both companies are committed to delivering scalable solutions that empower businesses with seamless IoT connectivity while navigating the region's complex regulatory landscape. Their strategic partnership enables enterprises and service providers to deploy IoT devices with low latency, local compliance and expanded reach across Africa and the Middle East.

Bayobab is a leader in providing connectivity and next-generation digital solutions across its African footprint. With investments in subsea and terrestrial cable networks, as well as communication platforms, Bayobab is focused on fulfilling its mission to bridge the digital divide on the continent. With a view to offer innovative products and services, Bayobab collaborates with organisations that can amplify its scale and multiply its extensive reach. As such, Bayobab uses floLIVE's advanced IoT core network, connectivity management platform, packet gateway for local breakout, and connectivity solutions utilising IMSI ranges to expand its IoT reach, scale its services and unlock new revenue opportunities. floLIVE plays a dual role in this partnership, serving as Bayobab's IoT platform and managed service provider while also enhancing connectivity options for global customers. By integrating Bayobab's IMSI range with floLIVE's extensive IMSI library, floLIVE enables its global customers to access seamless, multi-network and multi-country connectivity solutions across these regions. Given the vastness of the continent, there is a need to rely on a combination of IMSIs on the same SIM to deliver seamless switching. Bayobab trusts floLIVE to deliver at scale, creating a smart, future-proof IoT solution.

This strategic alliance strengthens both companies' market positions, providing enterprises with a highly flexible IoT ecosystem tailored to their needs.

Bayobab's business impact

- 70% reduction in infrastructure costs by switching to a cloud-based model.
- 100% increase in the new revenue through IMSI monetisation and wholesale expansion.
- Faster go-to-market with seamless onboarding and API-driven integration.
- Expanded IoT reach into previously unreachable African markets.

The challenge: scale and speed

As Bayobab is rooted in partnerships, a collaboration with floLIVE allows it to expand on its IoT efforts and create a rapidly scalable solution to resolve key challenges:

1. **Scale at speed**
 - In order to scale quickly and decrease time to market, Bayobab required a partner to rapidly initiate an IoT solution.
 - floLIVE provided an IoT platform with core network, connectivity management and billing to provide operational efficiency.
 - In a bid to future proof its products and services, Bayobab needed an IoT platform that could scale with growing demand, handle millions of connected devices, and support emerging 5G use cases.
2. **Unlocking new revenue streams**
 - A growth in enterprise demand presented an opportunity for increased revenue.
 - With extensive coverage in Africa and the Middle East, Bayobab was well- positioned to leverage IoT monetisation opportunities for existing and new customers and markets.
3. **Compliance and data security**
 - Expansion into new markets challenges MNOs operationally – for example, navigating local regulatory frameworks, data residency laws and security concerns.

The solution: how floLIVE and Bayobab partnered for IoT success

Bayobab partnered with floLIVE, leveraging its fully managed, cloud-native IoT platform to unlock new opportunities and streamline operations. This strategic collaboration expanded on Bayobab's reputation as a leading connectivity provider in Africa and the Middle East, while accelerating time-to-market for its IoT solutions. ►



1. **Accelerating IoT deployment**
 - Cloud-based IoT core and managed services – Allowed Bayobab to leverage the IoT services and not extend its existing infrastructure.
 - Faster time-to-market – Enabled Bayobab to focus on customer acquisition.
2. **Expanding global IoT coverage with multi-IMSI and local breakout**
 - Global IMSI library – Integrated Bayobab's IMSI into floLIVE's global IMSI library, allowing other floLIVE customers to benefit from it.
 - Multi-network roaming and local breakout – Provided low-latency, locally compliant IoT connectivity using floLIVE's PGW.
 - Improved coverage in previously untapped markets – Enabled Bayobab to serve new IoT markets without using its own infrastructure investments, which are geared towards rolling out connectivity across the continent.
3. **Ensuring compliance and optimising IoT signalling costs**
 - Regulatory compliance and data residency – Simplifying legal compliance across multiple markets by using global IMSI, multi-IMSI, eUICC SIM and multi-network connectivity without violating roaming policies such as permanent roaming local regulations and ensuring adherence to data privacy requirements.
4. **Secure, encrypted IoT data routing – Ensured compliance with global security standards.**
4. **Seamless API-driven integration**
 - Single API for full IoT management – Simplified customer integration.
 - Simplified MVNO onboarding – Enabled quick provisioning and activation.
 - One-stop shop for IoT connectivity – Allowed Bayobab to rapidly launch and scale IoT offerings.
5. **Unlocking new revenue streams through IMSI monetisation**
 - Bayobab IMSI available for global roaming – Monetised its IMSI range, creating new wholesale revenue opportunities.
 - Competitive pricing for IoT connectivity – Enabled better pricing options within regions that had previously proved challenging.
6. **Future-proofing IoT for 5G and next-generation deployments**
 - Cloud-native architecture for future scalability – Ensured long-term growth potential.
 - 5G-ready infrastructure – Enabled seamless evolution for smart cities, automotive and industrial IoT.
 - Support for private networks and enterprise IoT growth – Augmented Bayobab's positioning for high-value enterprise use cases.

How does this compare to traditional MNO/MVNO approaches?

Challenge	Traditional MNO approach	floLIVE and Bayobab approach
Infrastructure costs	High capex investment	Cloud-based, pay-as-you-grow model
Global IoT expansion	Complex roaming agreements	Multi-IMSI and local breakout
IoT monetisation	Limited revenue options	IMSI monetisation and wholesale IoT
Compliance risks	Regulatory complexity	Built-in compliance solutions
Scalability	Limited by legacy systems	Cloud-native, 5G-ready platform

Conclusion

The collaboration between Bayobab and floLIVE addresses Africa's connectivity challenges with a strategic combination of local IMSIs, local breakouts and seamless multi-IMSI switching. This enables automotive and telematics – the next-generation

connectivity applications of Africa – to function with constant monitoring and real-time communication. As demand for video applications increases, low-latency solutions will become essential, and Bayobab and floLIVE are committed to leading this transformation. ■



About Bayobab

Inspired by Africa's iconic Tree of Life, Bayobab is committed to providing next-generation digital solutions across the continent. Just as the roots of the baobab tree merge into a single, powerful trunk, Bayobab connects Africa by converging strategic global and local partnerships to work in harmony. Bayobab is a pan-African digital connectivity solutions company and a trusted gateway to the African continent. Through technology and innovation, we deliver reliable, open, next-gen digital

solutions that bridge Africa's digital divide.

Our two business lines, Bayobab Fibre and Bayobab Communication Platforms, work behind the scenes to ensure secure, reliable, and high-performance connectivity across Africa and beyond. From ensuring the highest levels of availability and encryption to enabling seamless global communication, we empower our customers to connect safely from anywhere in the world.



About floLIVE

floLIVE empowers Mobile Network Operators (MNOs) and Mobile Virtual Network Operators (MVNO) with a unique, comprehensive IoT connectivity solution that redefines global cellular services. By providing a carrier-grade Connectivity Management Platform (CMP) over the cloud, floLIVE simplifies IoT operations and enables seamless integration with other CMPs, serving as a true aggregator.

floLIVE's self-service portal caters to the Subscription Management (SM) market, empowering customers with full visibility and control. With eSIM support (SGP.32), floLIVE offers flexible, future-proof solutions that simplify the deployment of IoT devices globally.

With a rich set of connections with MNOs worldwide, floLIVE offers unmatched coverage augmentation, delivering low-latency, high-performance connectivity across borders. The company's global infrastructure, including PGW-as-a-service, optimizes IoT performance with local breakouts that ensure compliance with national and regional mandates.

As a cost-effective, managed service solution, floLIVE ensures that MNOs and MVNOs can deliver scalable IoT services to their enterprise customers while minimizing operational complexities. Backed by industry-leading technology investors, floLIVE's multi-IMSI SIM solutions enable partners to achieve faster time-to-market, simplified logistics, and superior connectivity that drives better business outcomes.



The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

We invite you to find out more at [gsma.com](https://www.gsma.com)



GSMA Intelligence is the definitive source of global mobile operator data, analysis and forecasts, and publisher of authoritative industry reports and research. Our data covers every operator group, network and MVNO in every country worldwide – from Afghanistan to Zimbabwe. It is the most accurate and complete set of industry metrics available, comprising tens of millions of individual data points, updated daily.

GSMA Intelligence is relied on by leading operators, vendors, regulators, financial institutions and third-party industry players, to support strategic decision-making and long-term investment planning. The data is used as an industry reference point and is frequently cited by the media and by the industry itself.

Our team of analysts and experts produce regular thought-leading research reports across a range of industry topics.

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Is global cellular IoT connectivity ready for the made-for-IoT era?

A new buzz around telecoms was visible at this year’s MWC Barcelona as mobile operators relish AI workloads, low latency use cases that demand 5G performance and the promise of new profits and partnerships. IoT connectivity is a big part of the enthusiasm but operators haven’t kept up with the demands of the market and others have innovated to fill the gaps and deliver simple, global cellular IoT connectivity, writes George Malim

IoT Now set the tone in our MWC issue with our cover story on how **Eseye** and **AT&T** are collaborating to support AT&T’s global customers with a new premium offering, called AT&T Global SIM Advanced. That offering combines Eseye’s AnyNet eSIM and its Infinity connectivity management platform (CMP) to enable orchestration of devices across the globe. This fully managed multi-IMSI eSIM solution has been designed to give customers reliable, secure global connectivity beyond permanent roaming when necessary.

“Having a single eSIM means OEMs with multiple regional or national variants can create devices that can connect to any mobile network, anywhere,” explained Nick Earle, the chief executive of Eseye, in that article. “This allows them to have a single, global product, with a single SKU number rather than having to have multiple regional and national variants. The complexity of managing the production line, supply chain, warehousing and distribution of multiple variants of the same product has a far greater cost than any mobile connectivity so being able to unify variants into a single product has massive economic advantages for the operator.”

The Eseye and AT&T collaboration is just one example of how even the largest mobile network operators are partnering to ensure high-quality coverage anywhere in the world can be achieved for IoT devices. There’s a recognition that the traditional approach of stitching together global cellular connectivity from a lead operator’s own networks and those of its preferred partners results in enormous management complexity, a poor user experience and lack of flexibility for IoT use cases.

Other specialists, such as **Aeris** which was at MWC fresh from completing its integration of the **Ericsson** IoT business, are also enabling lower friction global cellular connectivity. The company currently serves 100 million devices in 190 countries on its platform and 100 petabytes traverse the Aeris network. New chief executive, Aziz Benmalek, who joined in January, sees Aeris making global connectivity simpler for both large and small enterprises, adding a range of value-added services on top of the connectivity itself.

Sophisticated simplification

Aeris enables enterprises with a wide range of connectivity choices enabling them to go to any of Aeris’s carrier partners and also bring their own network so they can combine these into a global network with a flexible commercial model. “This is a very important point because when you look at IoT specifically it is complex to make that happen,” says Benmalek. “Given the scale we have today, we’re moving the complexity out and enabling simplification.”

“This is all about a much deeper go-to-market engagement as well as a richer partner ecosystem,” he adds. “With eSIM and the market dynamics the timing is very exciting and we’re well-positioned. Value-added services and security are key differentiators.”

floLIVE in contrast has built its own global IoT core network that allows it to constantly introduce new services and offerings over its in-house platform. In addition, to the global network, floLIVE offers a portfolio of capabilities that ▶



Nick Earle
Eseye



Aziz Benmalek
Aeris





“We’re building networks for all the mobile operators around the world and there is no significant operator that we are not involved with”

extend from the core network through to SIM management, a real-time multi-tier billing engine and its own CMP. Being present in global markets means complex regulatory environments which ban permanent roaming such as Brazil or Turkey can be served more easily.

“The way our network is designed is for very long term use but a lot of what is being discussed is a patch solution that you can’t control,” says Roni Cohen, the co-founder and head of business development at floLIVE. “The customer is becoming more sophisticated. Mid-size enterprises have outpaced the MNOs in their requirements and are the driving force behind the innovation.”

“Compliance requirements have never been higher but compliance just doesn’t work in roaming or in medical, financial or transport,” he adds. “The moment you associate an individual with their data you can’t transmit across a border whether that’s black box in a truck or a medical device.”

Beyond the classic operator-based ecosystem

None of these companies see themselves as being in competition with mobile network operators. Instead, they see themselves as enablers of additional revenues for mobile operators who can now generate revenue from IoT customers in ways that previously would have been impossible. In many ways, these are classic ecosystem plays in which an operator that has a customer based in its home market can utilise its network infrastructure, where available to support that customer, and turn to an IoT specialist to provide optimised global connectivity without friction where it doesn’t.

The operational features, from SIM services to billing, reporting and device management are essentially the cherries on top of the connectivity trifle. The specialist IoT communicators are happy to white label their offerings, if required. However, the operators should also be aware that these organisations do go direct to market and serve some of the world’s largest corporations on their own account. Mobile operators appear to be taking a mature approach to this level of co-opetition and supporting development of an innovative and highly-productive ecosystem around global cellular IoT connectivity.

“We’re building networks for all the mobile operators around the world and there is no significant operator that we are not involved with,” confirms Cohen. “There is no network that doesn’t need a solution from outside of their geographic area. For example, if you’re a mobile operator in the US and your customer is a US automaker,

you can’t guarantee latency in Australia or Africa and that means you can’t satisfy the connectivity requirements of advanced driver assistance systems (ADAS) or an infotainment system. If operators don’t partner with someone like us, that business will never be theirs. That partnership used to be focused on the roaming agreements between mobile network operators but you can’t sign a 20-year roaming agreement in support of a vehicle’s connectivity.”

FOMO for operators

That fear of missing out is an important driver for mobile operators. Being unable to provide service or more likely only able to provide a sub-optimal service in a customer’s market means that customers will find a local provider with whom to transact directly. As Cohen points out, that means no revenue and the potential to lose a customer to a rival that can also offer service in their home market. The thinking goes that it’s far better for both customer and operator to ensure they have the correct partners to deliver an optimal global service.

Aeris takes a different approach, preferring to partner with operators to ensure its global portfolio has all the attributes customers need. “Our strategy is for continued operational excellence and scale from infrastructure and operations,” explains Benmalek. “We operate with 30 operators and networks on a global level and look to extend our platform view with Aeris IoT Accelerator as the platform of choice for extended geographies and scalability with a service level agreement (SLA) at enterprise-grade level.”

“We continue to innovate with platform innovation extensions and new features across the user interface and user experience, and through a single pane of glass with value-added services on top such as our IoT Watchtower,” he adds. “You’ll see us continue to innovate with more use cases and services based on the value of the data we have and also with machine learning and artificial intelligence at the platform level.”

Made-for-IoT innovations

With significant traction in terms of increased volumes of cellular IoT devices and the lowering of previous barriers thanks to embedded and integrated SIMs (eSIM and iSIM), the IoT connectivity market has reached a new level of maturity. It has taken approximately 20 years, but with the introduction of the SGP.32 3GPP standard, set to be completed later this year, IoT finally has a made-for-IoT standard. This means the industry will no longer have to force-fit its connectivity ▶



needs to a landscape designed for consumer mobile users (see Comment, p4 this issue).

Greater familiarity with the use cases, a more mature ecosystem for IoT connectivity, which encompasses not only the mobile networks, and a slew of automation and simplification technologies sets the scene for a new era in IoT connectivity.

“It looks like we’re passing a significant crossroads for the mobile network operators who are

[looking to work] either outside or inside of their footprints,” says Cohen. “We’re seeing mobile network operators growing significantly on our network and they are supporting large enterprise customers in-country using our infrastructure. We power a significant number of other service providers and we have seen a very big ripple effect in what happens to end customers. We’re seeing very demanding enterprise customers who have come to an understanding that they need a lot more than one mobile network operator can offer.”

“Our strategy is for continued operational excellence and scale from infrastructure and operations”

Will 6G avoid the mistakes of 5G for simplified device connectivity?

5G has been a technology in search of a use case and that’s probably been a blessing in disguise because few operators have been able to support the needs of advanced use cases. AI workloads, network slices for specific communications tasks and the ultra-low latency demands of a growing array of IoT applications were not designed-in to 5G from the start and mobile operators’ systems are not constructed with these offerings in mind. 6G, which is still over the horizon, is set to address these issues and careful planning has been put in place.

“In 5G we gave too many options for vendors and operators so they struggled to get it right for vertical industries and for the proliferation of connected things,” says Rajesh Pankah, the executive vice president and chief technology officer at **Interdigital**, a global research and development company focused primarily on wireless, video, artificial intelligence and related technologies. “The strategy going into 6G now is how do you build the fundamental platform for a device that needs to connect. That involves coverage capacity and low latency and, once you have the basic requirements laid out, you can scale up. This is about what the device can do.”

That device focus for 6G will be refreshing given that it’s likely to be the high-speed, high capacity use cases of devices – rather than consumers – that drive 6G demand. “In the 6G world, there will be data as-a-service and AI as-a-service along with network as-a-service so the framework put in place by 3GPP standards is designed to enable that,” confirms Pankah.

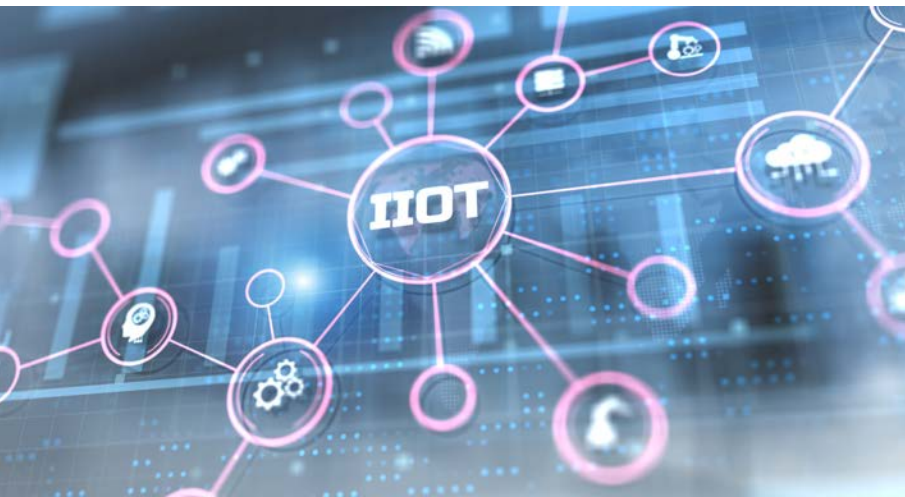
“The big lesson that has been learned from the 5G framework is that it tried to work with all the implications from different verticals to build a system that had all those different options,” he adds. “It’s better to build a platform that’s adaptable. We don’t want to specify how an app will be built but just to say: here’s everything that will be available to you, go and build and monetise and commercialise.” ■





AloT: 9.1 billion devices by 2033

Artificial intelligence (AI) and the Internet of Things (IoT) are two of the most impactful and far-reaching technology developments of our time. Increasingly these two technologies are deployed together and the term AloT has come to the fore. In this article, Transforma Insights discusses the market potential for AloT devices and the AI use cases found onboard these devices



In the case of AV equipment, for example, we expect that by 2033, approaching four billion of a total of 5.6 billion IoT devices will have AI capabilities onboard and so be AloT

IoT devices can generate significant amounts of potentially valuable data and AI-analytics can be applied to this data in many locations, including cloud data centres, various network edge locations and on board the actual IoT devices themselves. All of these approaches have the potential to unlock significant value and new insights from IoT data.

When we refer to AloT we mean the deployment of AI use cases on board IoT devices.

Applying AI to IoT data on board the source IoT devices can bring significant benefits, including improved performance, enhanced compliance, privacy and security and potentially reduced operational costs.

Market potential for AloT devices

The potential for AloT is significant. As illustrated opposite, **Transforma Insights** forecasts that total AloT connections will grow from 1.4 billion at the end of 2023 to 9.1 billion at the end of 2033. This is a more than six-fold growth in ten years, resulting in a CAGR of over 20%. Overall AloT represents a significant market with net additions growing from

less than half a billion in 2023 to just over 900 million in 2033.

For context, we forecast a total of 39 billion IoT devices at the end of 2033, up from 16 billion at the end of 2023. Accordingly, we forecast that 9% of IoT devices have on board AI in 2023, rising to 23% in 2033. The rate of growth of AloT penetration of IoT devices slows towards the end of the forecast period, primarily due to the AloT penetration of key consumer IoT applications reaching saturation.

Clearly, AloT is not equally well-suited to different IoT applications and rates of adoption of AloT will vary widely across different IoT application groups.

In the case of AV equipment, for example, we expect that by 2033, approaching four billion of a total of 5.6 billion IoT devices will have AI capabilities onboard and so be AloT. Similarly, a very significant share of vehicle head unit and IT infrastructure IoT devices will be AloT. Conversely, a negligible (or zero) share of inventory management and monitoring, building lighting, and track and trace IoT devices will have AI capabilities onboard.

As is the case with IoT, consumer devices dominate AloT although the share does decline, falling from 85% in 2023 to 81% in 2033. This is mostly a result of a simple underlying dynamic, which is that the addressable markets for devices like smart watches, smart TVs and smart speakers (i.e. individuals and households) are far larger than the addressable market for, say, autonomous agricultural vehicles.

The adoption of AloT in cross-vertical IoT devices (supporting applications that are similarly applied across all industry verticals, such as, for example office HVAC systems) rises from 7% to 10%. Meanwhile, the share of AloT in enterprise markets is 8% in 2023, growing to 10% in 2033 as AloT becomes deployed in support of ever more enterprise contexts, albeit with an adoption lag compared to simpler and higher-volume ▶

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Key benefits of AIoT

- 

Improve application performance

 - Analysis of inputs at greater resolution.
 - Analytics running faster, closer to source.
 - Increased resiliency and uptime.
- 

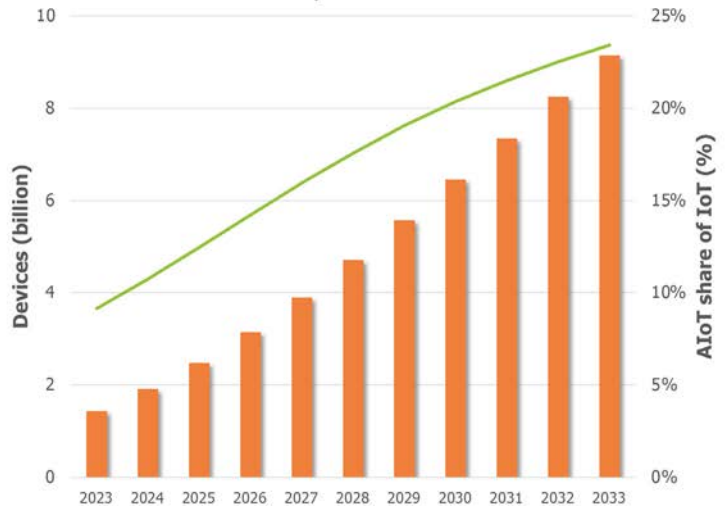
Enhance compliance, privacy and security

 - Personal data stays on the IoT device.
 - Anonymisation of data at source.
 - No transmission of confidential data.
- 

Reduce operational cost

 - Optimisation, pre-emptive maintenance.
 - Lower connectivity and processing cost.
 - Deployment in more marginal locations.

AIoT connections, 2023-2033



consumer markets. Within enterprise contexts, the biggest enterprise sectors are government, health, transport and finance, primarily driven by the adoption of CCTV, healthcare monitoring, road fleet management and usage based insurance respectively.

The AI use cases found onboard AIoT devices

The concept of AIoT does not exist in a vacuum, and AIoT capabilities are only ever deployed onboard an IoT device in support of an AI use case that the device in question is required to support. Again, the influence of consumer markets is clear with the most frequently featuring use cases being natural language processing, chatbots and digital assistance (both often associated with smart speakers) and image processing and analysis (often associated with smart TVs).

Many AI use cases do, however, find traction beyond the core IoT applications that the casual observer might naturally associate with the AI use case in question. For instance, whilst natural language processing might most obviously be associated with AIoT applications like smart speakers and headphones, the same use case will also find traction in environments such as vehicle head units and televisions (in both cases to support voice control, for example).

Accordingly, we might from the perspective of a vendor of AIoT natural language processing capabilities (either hardware or software, or associated functions), identify different kinds of opportunity in AIoT contexts. From this perspective, 'primary opportunities' and 'extended opportunities' could be defined as follows:

- **Primary opportunities** are AIoT devices that have specific AIoT use cases as part of their primary function. For example, AIoT enabled smart speakers will almost always have AI natural language processing capabilities.
- **Extended opportunities** are AIoT devices that may host specific AIoT use cases to support enhanced functionality. For example, AIoT televisions will quite often have AI natural language processing capabilities.

From this perspective, and based on Transforma Insights' AIoT forecasts, the total AIoT market opportunity for natural language processing capabilities in 2030 is made up of 1.8 billion devices that are primary opportunities and a further 1.7 billion devices that are extended opportunities. Similarly, the total AIoT addressable market for the image processing and analysis use case is forecast to be 1.4 billion primary opportunities and a further 2.5 billion extended opportunities.

AIoT merges the concepts of AI and IoT, enabling AI use cases directly on IoT devices to unlock benefits including better performance, enhanced compliance and reduced costs. The market is set to grow from 1.4 billion AIoT connections in 2023 to 9.1 billion by 2033. Key use cases include natural language processing and image processing and analysis, especially in consumer applications although adoption in enterprise markets is accelerating. ■

AIoT merges the concepts of AI and IoT, enabling AI use cases directly on IoT devices to unlock benefits including better performance, enhanced compliance and reduced costs



Satellite provides a flexible fit for IoT's diverse connectivity demands

Two-way satellite communication at the edge is transforming how IoT use cases connect in real-time regardless of their location. Mark O'Connell, the general manager for EMEA and APAC at [Globalstar](#), tells IoT Now how satellite connectivity has been transformed as low earth orbit (LEO) constellations have reduced costs and improved accessibility to satellite connectivity for IoT

IoT Now: How are the recent innovations in satellite connectivity improving affordability and accessibility for IoT use cases that utilise satellite connectivity? Is cost or coverage driving market uptake?

Mark O'Connell: Satellite connectivity has undergone a dramatic transformation, driven by the expansion of LEO constellations and advances in hardware miniaturisation. These innovations have significantly cut costs and made satellites more accessible for a broader range of IoT use cases. LEO networks reduce the distance data must travel, decreasing latency and enabling lower power consumption. This means devices can transmit data using simpler, less energy-intensive components, ideal for small sensors or battery-operated trackers.

On the hardware side, manufacturers are creating compact, cost-effective modules which eliminate the need for large antennas and complex deployments, making satellites more plug-and-play than ever. While coverage remains a core advantage, cost efficiency and ease of integration are now equally strong market growth drivers. As a result, satellite connectivity is no longer just a tool for niche applications but rather a central component of large-scale digital transformation strategies.

IoT Now: Please can you explain ways in which satellite connectivity can outperform cellular connectivity for IoT applications? Is satellite's winning argument still its ubiquitous coverage or are there specific IoT use cases where satellite wins for other reasons in addition?

MO'C: Cellular connectivity works well in urban and suburban areas, but it becomes unreliable – or entirely unavailable – in remote, rural or mobile environments. Satellite connectivity steps in where cellular drops off, offering ubiquitous coverage across land, sea and air. This makes it indispensable for industries like mining, maritime, logistics and emergency response.

But coverage isn't the only differentiator. Satellite also brings a level of resilience that cellular networks can't match. In times of disaster, when storms, fires or power outages disrupt terrestrial infrastructure, satellite networks continue to operate. Many satellite providers, including [Globalstar](#), have built-in redundancies like multiple ground stations and multi-path capabilities to eliminate single points of failure.

Moreover, satellite connectivity excels in high-mobility scenarios, such as aviation or global cargo shipping,

where a device must maintain communication across large, constantly shifting geographies. It also reduces complexity for cross-border operations, eliminating the need for roaming agreements or dealing with fragmented cellular coverage. In short, satellite wins not only where cellular fails, but where IoT applications require unbroken, reliable and borderless communication.

IoT Now: IoT devices do not necessarily have the same requirements as other enterprises or person-to-person communications. How can satellite communications support the flexibility IoT use cases need? For example, an asset tracking device in a desert might find satellite is the only available connectivity but it only needs to utilise satellite capacity at preset intervals to communicate relatively small payloads of data. However, a sensor on an oil pipeline is less predictable and may need to have guaranteed availability for safety reasons. How do modern satellite services accommodate the different demands?

MO'C: One of the strengths of modern satellite connectivity is its ability to adapt to a wide range of data and power requirements. Not all IoT applications are created equal. As you mentioned, myriad use cases have many different requirements, from high bandwidth to low power and beyond. The asset tracker in your example might only need to send one reading daily. In contrast, your sensor monitoring pressure in an oil pipeline may need to transmit real-time alerts to prevent catastrophic failure.

Today's satellite services are built to support both scenarios and everything in between. One-way satellite systems are designed for simple, low-data transmission. Small, lower-complexity satellite devices, for example, are ideal for asset tracking and environmental monitoring, using minimal power while maintaining years-long battery life.

On the other end of the spectrum, two-way satellite communication enables more complex use cases, such as remote control, diagnostics or dynamic sensor data. These systems support mission critical operations, ensuring that data is sent and that commands or responses can be received in real-time. For the oil pipeline monitoring scenario, the monitoring device can act in near real-time to stop the issue to avoid failure – removing the need to deploy field technicians.

The combination of low-power hardware and variable bandwidth options allows businesses to tailor their ►

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satellite deployment to each use case's demands. This flexibility makes satellite an excellent fit across diverse IoT environments – from livestock tracking to critical infrastructure.

IoT Now: Mass-scale IoT demands connectivity infrastructure that can scale up in line with device uptake. Is satellite ready for the demands of mass-market IoT?

MO'C: Absolutely. Satellite infrastructure has matured rapidly to meet the growing scale of IoT deployments. The emergence of LEO constellations has improved bandwidth capacity and latency, allowing satellite networks to handle high volumes of devices transmitting simultaneously across vast geographies. Satellite providers can offer reliable service with predictable costs and consistent performance, critical factors for enterprises managing thousands or millions of devices.

In many ways, satellite is more scalable than cellular. Scaling a cellular network to support widespread IoT requires extensive physical infrastructure: more towers, fibre, backhaul, gateways, routers. Each deployment often comes with high capital cost and long lead times, especially in rural or underdeveloped regions where infrastructure may be limited or entirely absent.

On the other hand, satellite connectivity does not rely strictly on ground-based infrastructure to expand coverage. Once a satellite constellation is in orbit, connectivity becomes instantly available across vast geographies. New devices can be added to the network easily. This dramatically reduces deployment time and cost, making satellite a more agile solution as IoT scales globally.

Satellite also offers centralised control and uniform service quality across its footprint, eliminating the complexity of managing multiple cellular networks or negotiating roaming agreements across regions. This predictability and operational simplicity are critical for mass-market IoT deployments.

IoT Now: What do you see as the main issues affecting satellite communications for IoT in the next 12 months?

MO'C: As satellite IoT adoption accelerates, several key challenges are coming into focus. First, regulatory complexity remains a friction point, especially for global deployments. While satellite offers advantages over cellular in avoiding roaming agreements, providers must still navigate varying national regulations and spectrum licensing requirements, which can delay or limit expansion in certain regions.

Second, as the number of connected devices increases, network congestion becomes a concern. Ensuring that critical communications maintain priority while managing millions of simultaneous transmissions will require ongoing innovation in traffic management and routing

protocols. Providers must also develop strategies to ensure quality of service, particularly for time-sensitive or high-value data streams.

Interoperability is another major hurdle. Although many satellite systems now support standardised application programme interfaces (APIs), fragmentation still exists across platforms and device types. Continued progress in industry standardisation will be necessary to ensure smooth, multi-vendor deployments.

Lastly, cybersecurity cannot be overlooked. With more devices online and transmitting sensitive data, the threat landscape expands. Satellite providers must invest in robust encryption, authentication protocols and monitoring systems to defend against attacks.

Despite these challenges, the trajectory is overwhelmingly positive. Competition is growing and the market is expanding. Satellite is not only overcoming legacy limitations – it's rising to meet the complex demands of next-generation connectivity at scale. ■

As satellite IoT adoption accelerates, several key challenges are coming into focus

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Mark O'Connell
Globalstar





Satellite tackles the new digital frontier with ubiquitous coverage



While cellular networks (LTE and 5G) are widely utilised for IoT deployments, they fall short in remote, mobile or mission-critical environments

As industries explore new frontiers in automation, remote monitoring and intelligent operations, many are hitting a wall where cellular and Wi-Fi simply cannot reach. From offshore rigs and dense forests to sprawling farmland and disaster zones, the demand for reliable, global communication is skyrocketing. Once known for its complexity and cost, satellite technology has emerged as a key enabler of digital transformation across these challenging environments

Utility infrastructure, especially oil and gas pipelines, forms the backbone of modern industry

Historically, satellites were considered a last resort – bulky, expensive and difficult to integrate. Geostationary earth orbit (GEO) satellites, orbiting more than 35,000km from Earth, offered broad coverage but struggled with latency and required large infrastructure. That paradigm has shifted drastically with the rise of low-earth orbit (LEO) satellites.

Operating between 500 and 1,500 km above Earth, LEO satellites provide near real-time communication with lower latency. The reduced distance has enabled manufacturers to develop smaller, lower-power devices connecting to satellites without recharging batteries or requiring oversized antennas. This evolution has also slashed connectivity costs, bringing satellite technology into mainstream IoT and enterprise operations.

Why satellite operations outperform cellular in harsh environments

While cellular networks (LTE and 5G) are widely utilised for IoT deployments, they fall short in remote, mobile or mission-critical environments. Satellite connectivity offers a resilient, global alternative, especially valuable where terrestrial infrastructure is limited or disrupted.

Cellular relies on towers and fibre, which are concentrated in populated areas. This creates dead zones in deserts, oceans, rural sites and industrial locations like mines and pipelines. LEO satellite constellations, by contrast, deliver continuous, borderless coverage. Cellular connectivity often requires navigating complex roaming agreements and regional licensing. ►

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Satellite bypasses this challenge. With a globally coordinated spectrum, satellite operators handle authorisation, not the end user, and offer predictable coverage and cost across borders.

Expanding cellular networks often means installing towers or laying fibre, which can be time-consuming and expensive. Satellite enables rapid, infrastructure-free scaling, letting businesses deploy anywhere with consistent performance.

How satellite powers essential industries

While the promise of digital transformation spans industries, its most urgent application is in sectors where operational downtime is costly, visibility is difficult and human safety is paramount. These are the environments where traditional connectivity fails and satellite-supported Internet of Things (IoT) has become helpful and essential.

Pipeline monitoring: utilities need eyes everywhere

Utility infrastructure, especially oil and gas pipelines, forms the backbone of modern industry. These systems often stretch across remote terrain, crossing deserts, mountains and regions with limited or no cellular connectivity. Monitoring this infrastructure is critical not only to protect against corrosion, leakage or pressure failure but also to comply with strict safety regulations and environmental standards.

Traditionally, operators relied on manual inspections and periodic maintenance, which introduced a significant lag between issue and response. IoT has changed that by allowing for continuous, real-time monitoring, but only if connectivity is constant. That's where satellite becomes a game-changer.

Globalstar and MOBILTEX: Keeping pipelines protected

MOBILTEX, a provider of cathodic protection monitoring, faced this exact challenge. Its CorTalk RMU1 system is designed to monitor pipeline health, but many of the locations where pipelines run are far from reliable cellular coverage. To ensure data could be transmitted regardless of location, MOBILTEX turned to **Globalstar**.

By integrating Globalstar's **STX3** satellite modem, MOBILTEX enabled real-time communication from its CorTalk units, even in the most isolated regions. The result? Pipeline integrity data is now instantly available via the CorView cloud platform, alerting operators to irregularities before they become problems. This not only boosts safety and compliance, but drastically reduces the need for field inspections – saving time and money, and reducing risk.

Ocean research: Precision matters at sea

Scientific research, particularly in oceanography and climate science, depends on highly accurate, continuous environmental data. This data helps predict weather patterns, manage marine ecosystems and guide public safety responses, such as oil spill containment and search-and-rescue operations. As ocean activity increases – through wind farm development, shipping lanes, and offshore drilling – the need for precision has never been greater.

IoT has empowered researchers to capture real-world, real-time data with unprecedented frequency. But at sea, cellular is not an option, and even radio-based communications can be limited by range and interference. Satellite connectivity ensures that research can continue regardless of location or conditions.

Globalstar and WHOI: Mapping ocean currents in real-time

The **Woods Hole Oceanographic Institution** (WHOI) recently

partnered with NOAA to better understand how ocean current radar signals are affected by offshore wind turbines. To validate radar models, WHOI launched a fleet of low-cost 'drifters' into the ocean, each equipped with Globalstar **SmartOne C** GPS trackers.

These devices transmitted location data in real-time, allowing researchers to compare actual drift patterns with radar-based predictions. This effort helped NOAA refine its radar systems and ensure that new offshore infrastructure wouldn't compromise data accuracy.

Globalstar's role was critical – without satellite, the data would have been delayed, incomplete, or simply inaccessible. In this case, IoT and satellite weren't just supporting science – they were actively enabling better environmental protection, maritime safety, and research accuracy.

Smart ranching: Data-driven agriculture in action

Agriculture is undergoing a digital revolution. As farmers face labour shortages, climate variability and growing demand for sustainable practices, IoT has emerged as a powerful tool for monitoring animal health, improving resource efficiency, and increasing productivity.

But much of the agricultural world exists beyond the bounds of reliable terrestrial networks. Livestock can roam for miles, equipment moves across remote pastures, and the need for mobile connectivity is constant. Satellite provides the link that cellular simply can't.

Globalstar and FindMy: Rethinking livestock management

FindMy, based in Norway, has developed a direct-to-satellite smart collar for livestock. These lightweight devices monitor an animal's location, movement and behaviour using onboard sensors and GPS – and it relies on Globalstar's **STX3** chip for connectivity.

Unlike traditional systems that offer aggregate herd data, FindMy gives ranchers a granular view into individual animal health, feeding patterns and unusual behaviour, such as illness or injury. It also enables ranchers to geo-fence their livestock – essentially, defining an area in which they want their livestock to graze.

The combination of rugged hardware, intelligent data and reliable satellite connectivity gives ranchers the tools to work smarter, not harder – regardless of geography.

Across environments, one constant: Connectivity

Whether it's critical infrastructure, scientific research or sustainable agriculture, the common thread is clear: modern operations require uninterrupted access to real-time data. That means connectivity can no longer be a constraint.

These case studies underscore the growing role of satellite in enabling industries to operate with greater safety, precision, and efficiency – far beyond the reach of fibre, Wi-Fi or cellular. And as satellite hardware gets smaller, cheaper and easier to integrate, the question is no longer "why satellite?" – it's "why not?"

Learn more about Globalstar and how satellite connectivity can power innovations from the ground to the stars. ■



IoT Solutions World Congress points to the new trends

Artificial intelligence, industrial IoT, digital twins, augmented reality, 5G connectivity... these are some of the digital technologies that can potentially change the industrial sector at great speed. The IoT Solutions World Congress (IOTSWC) will bring together thousands of attendees to showcase the way forward, writes Antony Savvas

Organised by Fira de Barcelona, the 2025 edition of IOTSWC will take place on 13-15 May at the Fira Gran Via, Barcelona, Spain venue. In its tenth anniversary, under the theme "Connect to the Next Level", IOTSWC will include a congress programme structured across three main themes: digital transformation strategy, emerging technologies and processes, and work in adverse environments.

IOTSWC will be structured around four areas: an exhibition zone featuring leading companies, the StartUp Pavilion, highlighting the most disruptive emerging projects, The Dome, that will host several presentations, and the congress programme, with experts from around the world specialising in digital transformation. The programme will focus on three main topics: Power of Innovation, Emerging Technologies, and 5G and Wireless Connectivity. ►





The IOTSWC will be held jointly with the Barcelona Cybersecurity Congress (BCC), also organised by Fira de Barcelona. The two shows will bring together more than 250 international exhibitors in Hall 8 of the Gran Via.

The conferences and sessions will feature top-level speakers who will tackle issues such as the use of AI to generate economic return, the optimisation of processes as a sustainable initiative, the use of autonomous vehicles – such as robots or drones – to operate in environments inaccessible to humans, the energy transition and the future of Europe in the global AI race, among other topics. And success stories will be presented to show how the application of disruptive technologies is contributing to a change in business models.

Among the speakers are Emanuela Girardi, president of **ADRA**, the European association for AI, Data and Robotics, the head of environmental, society and governance (ESG) services at **Fujitsu Spain**, Elisabeth Margarit Borrás, the executive director of **Qilimanjaro Quantum Tech**, Marta Pascual Estarellas, **Atlantis Industries** founder and CEO Brad Morrison, the generative AI expert and co-founder of **Microbrains**, Claudio Lima, and the head of the telecommunications programmes of the future division of the **European Space Agency (ESA)**, Xavier Lobao.

Other companies attending include the likes of **Avanci**, **Edge Impulse**, **Emnify**, **iot squared**, **STMicroelectronics** and many more.

Last year

Last year's combined event drew around 11,000 attendees. Director of the IOTSWC, Marc Tarragó, says: "IOTSWC 24 was an outstanding showcase for the solutions and technologies that are reshaping the industrial landscape. Visitors were able to discover how digitisation can future proof their companies and business, while experts and exhibitors provided an accurate roadmap of how to achieve this."

Last year attracted official delegations from China, Brazil, Denmark, India, Turkey and Wales, together with hosted buyers from countries such as France, Germany, Ghana and Poland.

In 2024, 70% of IOTSWC visitors were decision-makers, while the BCC had 77% of attendees in this category.

LoRaWAN

At this year's event, with the aim of bringing the LoRaWAN protocol closer to the industrial sector, the **LoRa Alliance** has organised a conference to showcase success stories.

Implementation options, and end-user experiences will be covered, to help drive take-up of the low-power, open wireless communication technology for data transmission between IoT devices. ▶

The IOTSWC will be held jointly with the Barcelona Cybersecurity Congress (BCC), also organised by Fira de Barcelona



The event will also address these challenges from a gender perspective, highlighting the role of women in cybersecurity

Cybersecurity

Enhancing digital protection in an increasingly interconnected world will be a challenge discussed at both IOTSWC and the Barcelona Cybersecurity Congress.

BCC, co-organised with the Catalonia Cybersecurity Agency (ACC), will feature companies and experts who have developed tools to create a “safer digital world” at a time when the surge in connected IoT devices and the adoption of 5G technology have heightened exposure to cyber attacks.

Under the slogan ‘Building a Secure Future for Industries’, the BCC will feature an exhibition area, and a congress addressing issues such as the need to increase investments in cybersecurity, emerging technologies, and supply chain protection. It will also include a Hacking Village, where ethical hacking experts will demonstrate their skills and share knowledge.

The BCC will share the StartUp Pavilion and The Dome with IOTSWC. One of the new features of this year’s edition is the VIP Cocktail Party, an exclusive event for C-level executives from major companies, aimed at fostering networking.

STEM Women

On 14 May, as part of the IOT Solutions World Congress, there will be a special STEM Women Congress event, a space designed to promote innovation, technology, and female talent in science, technology, engineering, and mathematics (STEM).

Throughout the day, the event will explore cybersecurity in key economic sectors and analyse challenges and solutions to ensure protection in industries where security is paramount. “From critical infrastructure to finance and healthcare, we will discuss how to strengthen resilience to cyber threats in an increasingly digitalised world,” the organisers say.

The event will also address these challenges from a gender perspective, highlighting the role of women in cybersecurity, and the importance of diversity in fostering innovative and inclusive approaches to future challenges.

Awards

Robots for land and lunar exploration, AI systems to monitor large infrastructures and industries, more sustainable fuels, and satellites to promote low-cost connectivity or applications to improve the cybersecurity of companies. These are some of the 15 projects eligible for the Industry Solutions Awards 2025, which will be presented during IOTSWC.

The expert jury for the awards has listed potential winners from Germany, Saudi Arabia, Australia, France, Iran, Spain and the UK, involving areas like AI, cybersecurity, connectivity, sustainability, and industry 4.0.

The IoT Solutions World Congress will take place on 13-15 May at the Fira Gran Via, Hall 8, Barcelona, Spain. ■



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Digital Transformation World offers the way forward for CSPs

Communications service providers are preparing to discuss the key business issues in Denmark. TM Forum, the global alliance of telco and tech companies, will hold its annual DTW - Ignite Global Summit from 17-19 June 2025, at the Bella Center in Copenhagen, Denmark, writes Antony Savvas

TM Forum says it is the only industry body to count the world's top ten CSPs, and all the key hyperscalers as active, strategic members. With over 800 members, it says it is "on a mission to reinvent the telco industry" as a "vibrant part of the digital landscape".

Digital Transformation World (DTW) Ignite offers networking opportunities for more than 5,000 professionals in the technology, telecoms, and AI industries. It promises a "dynamic hub" where industry leaders, visionaries, and experts come

together to exchange ideas and insights that "will shape the AI-enabled future".

The event features an agenda including panel discussions, breakout sessions, and interactive workshops, and attendees are being promised numerous opportunities to network and collaborate. Beyond formal sessions, DTW Ignite provides informal spaces, such as lounges and meet ups, to foster "meaningful conversations in a relaxed atmosphere". ▶





Nik Willetts
TM Forum



George Glass
TM Forum



“From the main stage to private roundtables, the telecoms industry stepped up to the business challenge”

Who’s coming

Companies attending include the key organisations shaping the future of the wider communications world. They include **DOCOMO Euro-labs, Entel Chile, Ericsson, Ernst & Young, F-Secure, FASTWEB, Fierce Network, Gamma Telecom, GCI, Globe Telecom, Google Cloud, GSMA, Hong Kong Telecommunications, Huawei, IBM, IFS, Indosat Ooredoo Hutchison, Infosys, Inspur, Iridium Satellite, Iron Mountain, Jazz, Jio Platforms, KPN, Liberty Global Services, Lumen, MATRIX Software, Mavenir Systems, Microsoft, MTN, Nokia, Nvidia, Ooredoo Group, Oracle, Orange, PCCW Global, Pegasystems, Proximus, PwC, Rakuten Group, Red Hat, Safaricom, Salesforce, ServiceNow, Singapore Telecommunications, SK Telecom, Swisscom, T-Mobile, Tata Communications, Tech Mahindra, Telecom Italia, Telefónica, Telenor, Telia, Teradata, Turk Telekom, TURKCELL, Verizon, Virgin Media O2, Vodafone Group, Volt Active Data, Whale Cloud Technology, ZTE** and many others.

Last year

Last year, TM Forum’s Executive network, TEN100, convened CEOs, CTOs, CIOs and CFOs to “take collective leadership” for three new strategic “missions”, developed by TM Forum members to underpin growth:

Composable IT & Ecosystems – delivering a plug and play, “AI-fluent ecosystem”

Autonomous Network Operations – enabling seamless, intelligent automation at scale

Data & AI Innovation – unleashing new revenue streams

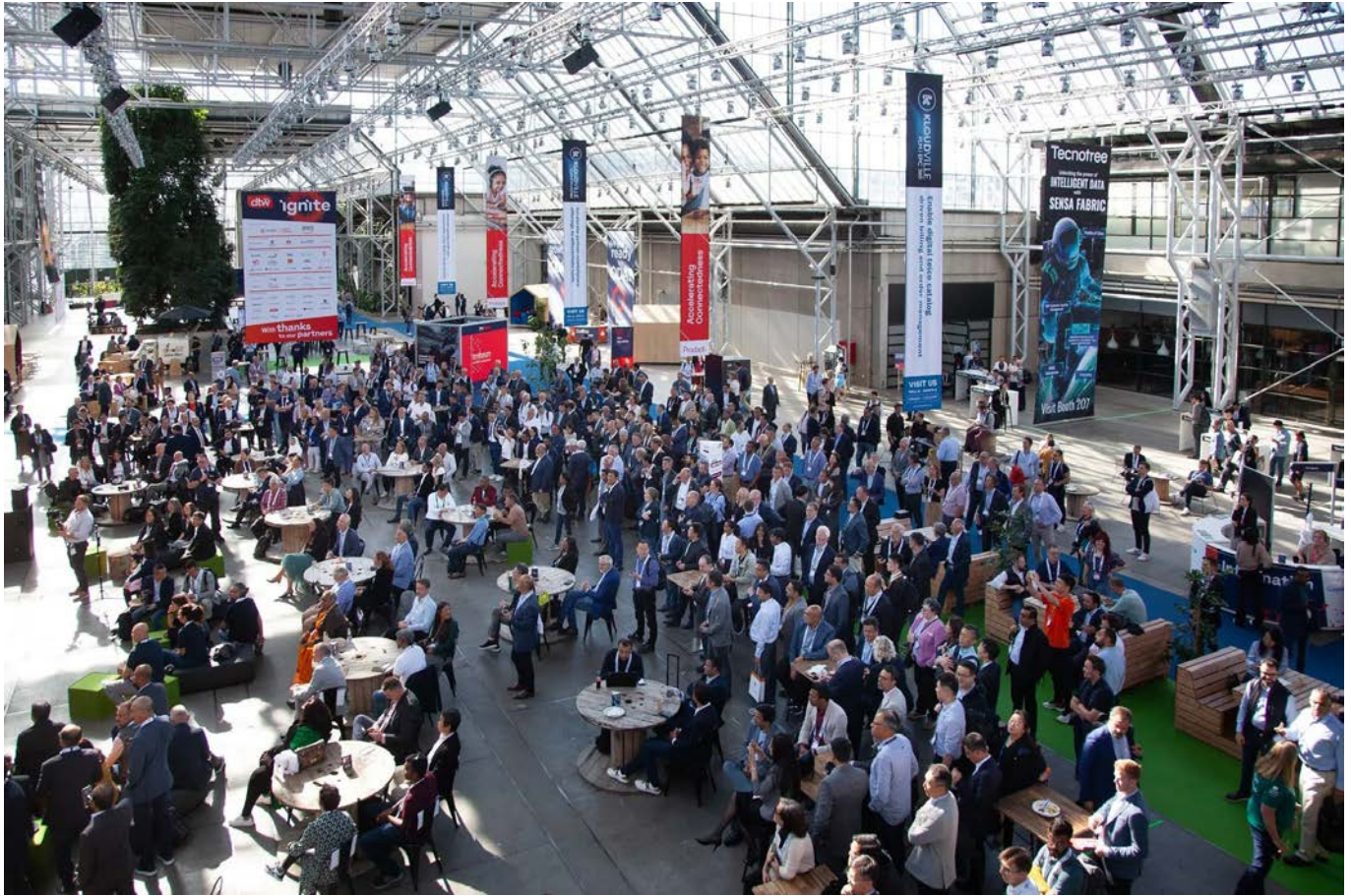
“From the main stage to private roundtables, the telecoms industry stepped up to the business challenge. We saw a crisper focus, more courage and optimism, ready to reimagine our value proposition in the emerging AI era, to create new value by opening our capabilities,” says Nik Willetts, CEO of TM Forum. “It’s clear that DTW – Ignite is the place where the industry convenes to co-create answers. The time for talk is over – we need action.”

Excellent awards

Entries for the TM Forum’s Excellence Awards are now closed, and winners will be announced on Tuesday 17 June, 2025, during DTW Ignite.

Since their inception, the Excellence Awards have recognised and celebrated innovative achievements spanning the TM Forum’s Open Digital Architecture (ODA) implementation, network monetisation and partnering, customer experience, autonomous networks, AI innovation, and benefits to people and the planet.

“As a neutral, non-profit organisation, our awards ensure a prestigious and impartial view, celebrating the success of key industry players across six categories,” say the organisers. ▶



Award categories in 2025 are:

Excellence in ODA implementation: For achieving outstanding business results through the application of ODA composability for IT transformation

Excellence in monetising the network: For pioneering new innovations that capitalise on the composable ecosystem capabilities of ODA to deliver new diversified solutions and growing telco revenues

Excellence in innovation for people and planet: For outstanding application of ODA, to achieve the “3 Ps of innovation” – people, profit and planet, achieving environmental, social and economic goals

Excellence in customer experience: For prioritising the experience of the customer in all contexts while mastering developer and customer experiences, including in revenue growing ecosystem scenarios

Excellence in autonomous networks: For leadership in realising next generation autonomous networks in achieving fully autonomous operations, including self-healing domains in fault and service management, as well as in capability planning

Excellence in data and AI innovation: For achieving significant business impact through innovative applications of AI and data capabilities in the implementation of agentic AI, LLMs and SLMs, for intelligent telco operations and business growth

Growing

The TM Forum is a growing organisation, demonstrating its relevance to the evolving communications industry. **Orchest**, a connectivity and automation specialist, is one of the latest organisations to join, as a service provider member.

As a member, Orchest is integrating TM Forum’s OpenAPIs into its automated platform and implementing the zero-wait concepts from TM Forum’s Autonomous Operations Framework, contributing to the digital ecosystem. This will enable companies to achieve “complete automation” using the Orchest Automation platform, while providing functionalities through standardized APIs from the MEF (Metro Ethernet Forum) and TM Forum.

Orchest offers solutions including a network quoting tool, an installation tracker, service inventory, business intelligence, tech support management, e-commerce, network geo-visualisation, API enablement and ►

“As a neutral, non-profit organisation, our awards ensure a prestigious and impartial view, celebrating the success of key industry players across six categories”



Bella Center Copenhagen is located in a central location in the heart of Ørestad

management, ERP and CRM deployment, and billing and invoicing control.

At the end of 2024, Orchest says it successfully automated network infrastructure in Indonesia for last-mile quoting, achieving its “first success story” outside of Latin America, by leveraging its “robust” address validation algorithm.

“Joining TM Forum is an important milestone for Orchest as we continue our automation journey, where standardisation is crucial. The TM Forum ecosystem complements our vision and objectives, and we look forward to contributing and supporting the ecosystem to help more companies achieve exceptional levels of efficiency,” says Jeremy Villalobos, CEO of Orchest.

George Glass, CTO of TM Forum, says: “We welcome Orchest at a pivotal moment for the telecoms industry. As automation becomes a cornerstone of transformation, Orchest’s

expertise aligns with our mission to drive open, interoperable, and AI-powered networks. “Their commitment to integrating open APIs and advancing autonomous operations will help accelerate industry-wide efficiency and innovation, supporting our collective goal of a more agile, customer-centric digital ecosystem, that unlocks growth in both value and purpose.”

Location, location

Bella Center Copenhagen is located in a central location in the heart of Ørestad, which has its own metro station. The Bella Center is just 6km away from Copenhagen Airport, and 8km from downtown Copenhagen. It has a direct link to the four-star AC Bella Sky Copenhagen hotel. DTW - Ignite Global Summit will take place on 17-19 June, 2025 at the Bella Center in Copenhagen, Denmark. ■

<https://dtw.tmforum.org/>



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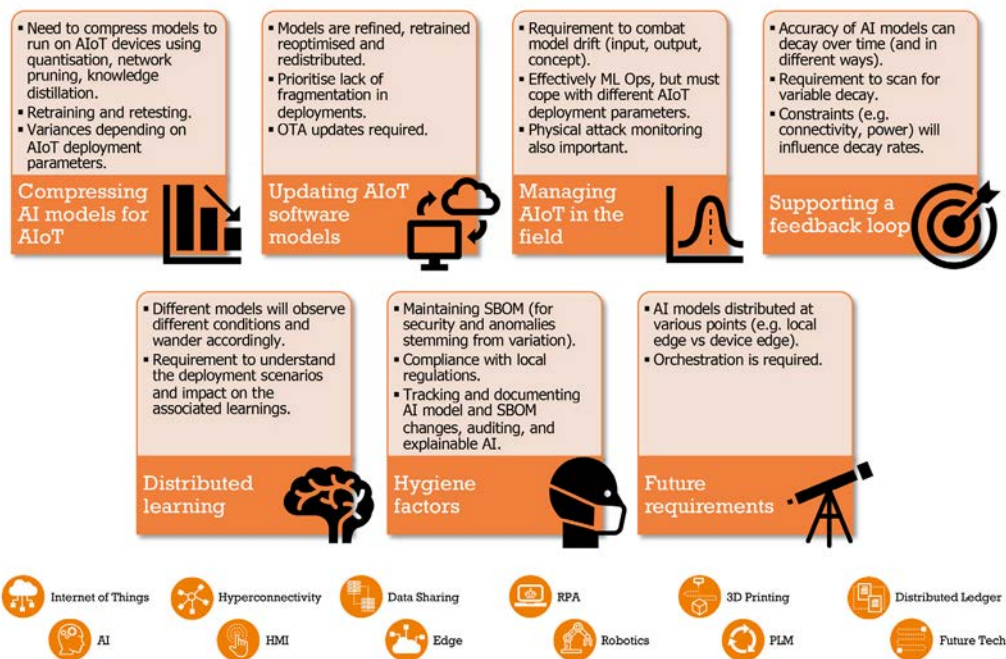
**Real Challenges.
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Real Change.**



Software platforms for AIoT must blend conflicting priorities from both IoT and AI domains

Artificial intelligence (AI) and the Internet of Things (IoT) are two of today’s most impactful technology developments. Inevitably, an increasing range of both enterprise and consumer applications and solutions utilise both technologies, so that they are enabled by both AI and IoT. A growing subset of these applications and solutions incorporate AI capabilities directly onboard an IoT device, as AIoT, unlocking benefits ranging from faster response times to more efficient use of connectivity bandwidth. This article, written by Transforma Insights, discusses some of the key capabilities that a software platform specified to support AIoT devices should have. It focuses on the specific requirements for supporting AIoT devices, rather than more generic requirements that are well-known in either IoT or AI contexts

Key aspects of AIoT platform functionality



AIoT environments are more constrained than cloud systems, requiring AI models to be compressed for deployment

AIoT is a meeting between two different worlds with different rhythms. IoT device estates may contain multiple generations of hardware, in support of use cases that may vary between end-user deployments, by geography and depending on connectivity technology. From an AI perspective, however, the frequently updated software models and user experience associated with these diverse endpoints should be as homogenous as possible.

Accordingly, the key capabilities that will be required to support AIoT device estates are a

consequence of the interplay between two very different technology domains that are themselves relatively complex. They are summarised in the diagram above and discussed in the following subsections.

Compress AI models for AIoT

AIoT environments are more constrained than cloud systems, requiring AI models to be compressed for deployment. Techniques like quantisation, pruning, knowledge distillation and training smaller models help reduce size, ►



although models must be retrained and tested after compression. Optimal compression varies by deployment context, connectivity type (and the cost of connectivity) and available hardware, creating trade-offs between performance, autonomy and consistent user experience. AIoT platforms must reflect device and network differences and fragmentation may grow as clients demand varying features. Rigorous ongoing testing remains essential for all compressed models as they evolve.

AI models in AIoT systems require frequent updates, retraining and re-optimisation. These updates must be distributed efficiently, which is easier with minimal device fragmentation. A uniform software environment across devices is very much preferred, but not always possible in AIoT environments and over-the-air (OTA) updates are critical for deploying new software securely. AIoT platforms should support phased rollouts, rollback options and A/B testing to manage disruptions and refine models in real-world conditions. Robust device management, already vital in IoT, becomes even more crucial in AIoT environments to ensure consistent, secure software deployment.

Managing AI models in AIoT environments requires the management of any input, output and concept drift. Unlike established AI settings, AIoT introduces unique challenges due to varying device conditions and contexts. Platforms must monitor performance, power use and connectivity, and support drift detection, root-cause analysis and contextual comparisons across device estates. Features like pre-emptive hardware maintenance, security monitoring (including physical interference) and fallback options to cloud processing will be key. AIoT platforms should also support adaptive communications strategies to minimise costly data transmission, especially for devices connected to cellular or satellite networks.

AI model accuracy can degrade over time due to evolving input data, requiring retraining. In AIoT, decay may vary across subsets of a device estate based on deployment context, hardware variations, or environmental conditions. Platforms must detect instances of faster-than-average decay and provide insights for model maintenance. Such performance monitoring is harder with battery-powered or wirelessly connected devices due to cost and energy limitations. One solution is using always-connected 'probe' devices to report performance, though this assumes their performance is representative of the broader device estate, and so this approach has inherent limitations.

Distributed learning

Distributed self-learning AIoT poses challenges as identical devices in different locations may evolve differently based on local conditions and experience of local events. This divergence makes it hard to generalise and share useful learnings, requiring expert insight to identify which rules can be applied elsewhere. For example, machine failure indicators may vary by environment, making direct comparisons difficult. AIoT platforms should

detect these evolving differences and support engineers by highlighting potentially valuable new patterns and suggesting ways to adapt and distribute them across the wider device estate.

AIoT platforms must also prioritise a range of hygiene factors. Keeping the software bill of materials (SBOM) current ensures AI models run on consistent, compatible systems, helping to avoid suboptimal outcomes. AIoT platforms should track all model and SBOM changes to aid in performance audits and decay detection. They must also comply with evolving AI, data privacy, and sovereignty regulations by adapting software based on device location. Support for explainable AI and audit-ready configuration information will be essential to meet regulatory and operational standards in diverse jurisdictions.

Future requirements

Future AI deployments may involve splitting AI functions between IoT devices (AIoT) and local edge gateways (edge AI), or across nearby AIoT devices. This creates added complexity, with AI components running on varied hardware and locations based on local context. Managing such distributed AI systems requires platforms that understand topography, connectivity quality and device capabilities. While some vendors already offer solutions for heterogeneous edge environments, these must be enhanced to meet the specific constraints and requirements of AIoT scenarios.

AIoT platforms must merge capabilities from both AI and IoT domains, balancing AI's fast-paced software evolution with IoT's long-lived, resource-constrained devices. While many required functions exist in AI or IoT domains, they aren't fully optimised for AIoT. IoT platforms often lack sufficient support for distributed AI, and AI platforms rarely consider IoT constraints. To support AIoT effectively, new capabilities are needed such as model optimisation for connectivity costs and power usage, especially for battery-powered devices. Additionally, performance and condition reporting must also account for similar limitations. A more cohesive and adaptable platform environment will be essential to fully realise the potential of AIoT technologies. ■

AI models in AIoT systems require frequent updates, retraining and re-optimisation

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Our pick of the IoT industry's upcoming events

IOT SOLUTIONS WORLD CONGRESS

IoT Solutions World Congress

13-15 May 2025
Barcelona, Spain

[https://www.iot-now.com/
event/iot-solutions-world-
congress-2/](https://www.iot-now.com/event/iot-solutions-world-congress-2/)

intelligent manufacturing

KUALA LUMPUR

Intelligent Manufacturing

Kuala Lumpur
14-16 May 2025

Kuala Lumpur, Malaysia
[https://www.iot-now.com/
event/intelligent-
manufacturing-kuala-lumpur/](https://www.iot-now.com/event/intelligent-manufacturing-kuala-lumpur/)



M360 Eurasia

21-22 May 2025

Tashkent, Uzbekistan

[https://www.iot-now.com/
event/m360-eurasia/](https://www.iot-now.com/event/m360-eurasia/)

GITEX EUROPE

21-23 May 2025

Berlin, Germany

[https://www.iot-now.com/
event/gitex-europe/](https://www.iot-now.com/event/gitex-europe/)

FIWARE Global Summit

22-23 May 2025

Rabat, Morocco

[https://www.iot-now.com/
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summit/](https://www.iot-now.com/event/fiware-global-summit/)



Dublin Tech Summit

Dublin Tech Summit

28-29 May 2025

Dublin, Ireland

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M360 LATAM

28-29 May 2025

Mexico City, Mexico

[https://www.iot-now.com/
event/m360-latam/](https://www.iot-now.com/event/m360-latam/)

THE BATTERY SHOW

EUROPE

The Battery Show Europe

3-5 June 2025

Stuttgart, Germany

[https://www.iot-now.com/
event/the-battery-show-
europe/](https://www.iot-now.com/event/the-battery-show-europe/)

Infosecurity Europe

3-5 June 2025

London, UK

[https://www.iot-now.com/
event/infosecurity-europe/](https://www.iot-now.com/event/infosecurity-europe/)

INTELLIGENT AUTOMATION

NORTH AMERICA

Intelligent Automation

North America

4-5 June 2025

Santa Clara, California, USA

[https://www.iot-now.com/
event/intelligent-
automation-north-america/](https://www.iot-now.com/event/intelligent-automation-north-america/)

AI & BIG DATA EXPO

NORTH AMERICA

AI and Big Data Expo North

America 2025

4-5 June 2025

Santa Clara, California, USA

[https://www.iot-now.com/
event/ai-and-big-data-
expo-north-america-2025/](https://www.iot-now.com/event/ai-and-big-data-expo-north-america-2025/)

Smart Manufacturing Week

4-5 June 2025

Birmingham, UK

[https://www.iot-now.com/
event/smart-manufacturing-
week/](https://www.iot-now.com/event/smart-manufacturing-week/)

London Tech Week

9-13 June 2025

London, UK

[https://www.iot-now.com/
event/london-tech-week-2/](https://www.iot-now.com/event/london-tech-week-2/)

IoT Days Summer:

Embedded IoT

11-12 June 2025

Digital Event

[https://www.iot-now.com/
event/iot-days-summer-
embedded-iot/](https://www.iot-now.com/event/iot-days-summer-embedded-iot/)

IoT & AI Visions Zurich

12 June 2025

Zurich, Switzerland

[https://www.iot-now.com/
event/iot-ai-visions-zurich/](https://www.iot-now.com/event/iot-ai-visions-zurich/)

DTW Ignite

17-19 June 2025

Copenhagen, Denmark

[https://www.iot-now.com/
event/dtw-ignite/](https://www.iot-now.com/event/dtw-ignite/)



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