

# IoT NOW

HOW TO RUN AN IoT **ENABLED** BUSINESS

## The IoT Now CEO Guide to IoT Connectivity 2023

### TALKING HEADS

Eseye's Nick Earle  
demystifies the  
disruption and details  
IoT connectivity's  
innovative future



**PLUS:** How will you gain from the new IoT connectivity landscape? • Inside PharmaWatch's mission to ensure reliable operations over cellular networks • Why IoT connectivity is now focused on services that aid simplicity alongside cost-efficiency • Transforma Insights reveals the path to 34.4bn IoT connections in 2032 • How T42 has kept on track with Eseye to remove barriers to scaling up international deployments • Why now isn't soon enough for IoT connectivity transformation • Biofourmis introduces the future of remote patient care • Read the latest News, Features and Interviews online at [www.iot-now.com](http://www.iot-now.com)



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# Why now isn't soon enough for IoT connectivity transformation



IoT uptake has been held back by needless complexity in enabling global connectivity. The requirement to localise devices so they can access operator connectivity has placed onerous demands on enterprises, causing them to question the viability of some IoT deployments. Now, with the SIM decoupled from the mobile network operator thanks to embedded and integrated SIM innovations, a new connectivity game is underway for IoT

It's about time the mobile network operator stranglehold weakened. It has seemed ridiculous that, if you want to introduce a new IoT proposition, you need to not only develop a device and software but then also create multiple versions so they can be connected to mobile networks in different markets. The idea that a small, medical devices company has to make several variants for each market it sells in and also maintain relationships with multiple mobile network operators is absurd and painful. It's no wonder IoT connectivity has been seen as a barrier.

Now though, the landscape has changed. Device makers can utilise embedded or integrated SIMs (eSIM or iSIM) that can be installed at the point of manufacture and then shipped to any location. At that point, they'll connect to the best available cellular network automatically. They can be managed over-the-air (OTA) and the first time the local operator knows about them will be when the device connects to their network.

This is a revolution for IoT and creates a wave of simplicity, removing a major IoT headache in one move. This doesn't even mean mobile operators are out of the game. Far from it, simplified IoT connectivity means more devices will connect and

more traffic can be charged for. Advanced mobile operators will even be able to become service providers, offering a new form of connectivity management to customers – provided they don't get hung up on the idea of owning the customer or ensuring devices prefer their networks.



**George Malim,**  
managing editor

In this new, freer environment there is good business to be done, as is clear from the number of providers circling the redefined IoT connectivity market. However, previous generation models have had their time and software-enabled connectivity delivered as a service to IoT organisations is the future direction.

The good news is that the transformation is underway now, the bad news is that now isn't really soon enough for the 80% of IoT projects that have failed.

Enjoy this IoT Now CEO Guide!

George Malim

**EDITORIAL ADVISORS**



**Robin Duke-Woolley,**  
CEO, Beecham Research



**Andrew Parker**  
programme marketing director, IoT, GSMA



**Gert Pauwels**  
head of commercial and marketing IoT and M2M, Orange Belgium



**Robert Brunbäck**  
director, Connectivity, Lynk & Co



**Aileen Smith**  
chief strategy officer, UltraSoC



**David Taylor**  
Board advisor on Digital and IoT innovation

**MANAGING EDITOR**  
George Malim  
Tel: +44 (0)7930 301 841  
g.malim@wkm-global.com

**EDITORIAL DIRECTOR & PUBLISHER**  
Jeremy Cowan  
Tel: +44 (0) 1420 588638  
j.cowan@wkm-global.com

**DIGITAL SERVICES DIRECTOR**  
Nathalie Millar  
Tel: +44 (0) 1732 808690  
n.millar@wkm-global.com

**SALES CONSULTANT**  
Cherisse Jameson  
Tel: +44 (0) 1732 807410  
c.jameson@wkm-global.com

**DESIGN**  
Jason Appleby  
Ark Design  
Tel: +44 (0) 1787 881623

**PUBLISHED BY**  
WeKnow Media Ltd, Suite 138,  
80 Churchill Square, Kings Hill,  
West Malling, Kent ME19 4YU, UK  
Tel: +44 (0) 1732 807410



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## Eseye and Orange team up to enhance global IoT connectivity offering

**Eseye** has entered into an agreement with **Orange Wholesale France** to enhance its global IoT connectivity solution. Under the agreement, additional localisation capabilities will be enabled which will enable enterprises to avoid permanent roaming challenges.

Orange Wholesale France, with its roaming agreements specifically for IoT use cases across many countries and regions, provides Eseye with a significant building block in its mission to solve global IoT challenges for enterprises. Not only does it increase Eseye's footprint, but it also augments the deeper technical localisation agreements that Eseye already has in place in regions such as North America, Brazil and Turkey, where there are restrictions on permanent roaming agreements.

Adam Hayes, the chief operating officer of Eseye, said: "Sponsored roaming is a highly effective way of delivering IoT services but unfortunately it doesn't

solve all use cases. Adding the Orange Wholesale offering with Eseye's technical localisation capabilities means we are able to offer wide-ranging access to local networks and roaming partners. Our vision is to provide global IoT connectivity solutions to the market. We pioneered the localisation trend, solving IoT problems in difficult jurisdictions such as North America and Brazil. As a result, we know how much engineering investment and work is involved in achieving full technical localisation and we are dedicated to ensuring we meet our customers' evolving IoT deployment needs."

Yannick Decaux, the senior vice president of mobile wholesale and interconnection at Orange Wholesale France, added: "Eseye is an experienced, deeply technical, IoT connectivity solution provider and therefore the perfect partner for us to engage with via our global connectivity agreement. We have been impressed by the



**Yannick Decaux, Orange Wholesale France**

organisation's commitment to solving some of the most challenging IoT problems and the company's desire to make global IoT connectivity available to all enterprises; a vision that we also uphold." ■

## Global IoT connections to hit 34.4 billion in 2032 predicts Transforma Insights

**Transforma Insights** has published a report titled 'Global IoT Forecast Report, 2022-2032' which reveals that at the end of 2022 there were 13.2 billion active IoT devices, a figure which will grow to 34.4 billion in 2032, at a compound annual growth rate (CAGR) of 10%. Short range technologies will dominate connections, accounting for 74% in 2032, a slight reduction compared to the 78% they account for today. Cellular connections will grow from 1.5 billion connections in 2022 to 6.9 billion in 2032, growing market share from 11.6% to 17.7%.

The firm says that 5G connectivity technologies, including massive machine-type connectivity (mMTC), are expected to replace 2G, and increasingly 4G. 2G connections will fall from 20% of total cellular connections in 2022 to 1% in 2032, with 3G already non-existent. Meanwhile, the 4G share will fall from 50% to 28%. During the same period 5G non-mMTC

connections will increase from 1% to 14%, with 5G mMTC connections increasing from 28% (mostly in China) to 57%.

Commenting on the findings, principal analyst Matt Arnott said: "The IoT market continues to develop largely as we expect, although with some interesting new dynamics. Connected vehicle sales in Europe and North America, for example, remain depressed post Covid whilst sales have returned to trend outside those markets. The traditional markets for smart metering, Europe, Greater China, and North America, will also soon be eclipsed by adoption in emerging markets such as South East Asia and Latin America. One thing that is becoming ever more clear is that the future for IoT as a whole will be dominated by low power wide area connectivity technologies, implying a need for associated low-cost supporting infrastructures." ■

## Wi-Fi-enabled product shipments to grow to 4.6bn in 2027 says IDC

The decline in smartphone and PC shipments in 2022 took its toll on overall shipments for Wi-Fi-enabled products, causing them to fall for the first time ever in Wi-Fi's decades-long history. After shipments grew 8.6% in 2021 fuelled by pandemic-driven market changes, they fell 4.9% in 2022 to 3.8 billion products with Wi-Fi, according to a new report from **International Data Corporation (IDC)**.

IDC forecasts the market to be relatively

flat in 2023 with shipments of just 3.9 billion products while 2024 will see 6.4% growth to 4.1 billion products. Two thirds of shipments in 2023 will be Wi-Fi 6 or Wi-Fi 6E, and these will continue to expand into more IoT devices as more Wi-Fi 6 chipsets targeting IoT devices hit the market.

Eight Wi-Fi-enabled product types will ship over 100 million units in 2023. This number will increase to 11 in 2027 with several more product types getting close

to 100 million. Primary client devices - smartphones, media tablets and PCs - are still a key driver of shipments with around 40% of Wi-Fi shipments in 2023. Primary client devices' recent share loss is due to the flattening of that market coupled with the growth of IoT or endpoint devices with Wi-Fi. IoT reached 37% of shipments in 2022 and will surpass 40% in 2027. IoT surpassed smartphones in 2021 and will surpass all primary client devices in 2027. ■



# eSIM forces device-first approach to IoT

Although too many IoT projects still fail, a renewed focus on IoT readiness and device capabilities has the potential to accelerate success for IoT organisations. The longstanding proprietary link between mobile network operators and devices is ending with the introduction of embedded SIMs, fostering interoperability and radically simplifying IoT connectivity. This is introducing new models for IoT, not just in connectivity but in terms of how devices are designed, managed and operated. This wave of disruption will result in simplified, flexible software-as-a-service approaches to IoT enablement in which mobile network operators either retrench to become high-volume low-value providers or upskill to deliver greater value to IoT organisations. For Nick Earle, the chief executive of Eseye, it's about time connectivity is decoupled from the operators and device capabilities are prioritised

## ***The rapid rise of artificial intelligence is the latest wave of disruption for IT***

### **IoT Now: What is your view of the latest wave of change affecting IoT connectivity and how do you expect it to reshape the IoT sector?**

**Nick Earle:** The IoT and cellular markets are undergoing more disruption and change than at any time that I can recall. I've been in IT for more than 40 years and I've never seen a rate of change like this. Over my career I've witnessed many waves of disruption such as mainframes giving way to PCs and PCs being replaced by mobile phones. I've also seen the software-enabled disruption from mainframe host operating systems to client server systems to open source and web-based development. The rapid rise of artificial intelligence (AI) is the latest wave of disruption for IT. In contrast, the mobile telecoms industry has been unusual in that it has been relatively static - until recently. Just in the last 12 months we have seen **Ericsson**, one of the largest suppliers, exiting the platform business and **Vodafone**, the leader in the **Gartner** IoT Connectivity Magic Quadrant, spinning the business out.

What has caused this sudden disruption? The answer can be found in the triggers for the previous disruptions I mentioned in IT. In each of those cases, two things happened; there was a major leap forward in technology and interoperability was achieved.

In connectivity, the leap forward in technology is the arrival of the embedded SIM (eSIM) and integrated SIM (iSIM) that has broken the 40-year proprietary lock between the international mobile subscriber identifier (IMSI) and the mobile network operators. This is causing a significant disruption in the mobile network operator business model as it enables an uncoupling of the choice of the SIM from the choice of operator. Add

to that the embedded universal integrated circuit card (eUICC) standard and new developments like the SGP.32 GSMA standard which enable over-the-air (OTA) remote SIM provisioning (RSP) of multiple operator IMSIs into a single SIM and you have the perfect disruptive storm.

### **IoT Now: Where does that leave the IoT connectivity business, and MNOs in particular?**

**NE:** For an enterprise, the cost of IoT data is relatively minor compared to the back-end process costs of building and maintaining multiple stock-keeping unit (SKU) numbers and gluing together multiple connectivity platforms to get a single source of truth over the IoT estate and its performance. They want to manufacture a single smart product that they can sell and activate globally and that means embedded global connectivity that just works - everytime and everywhere. Think of the alternative - without this capability you cannot test products at manufacture, you have to install plastic SIMs as you have to use different ones depending on the country or location and you have to use multiple connectivity management platforms (CMPs). These costs have hugely inhibited IoT adoption. To solve this, and create the financial incentive for IoT adoption, enterprises want the ability to have a connectivity solution that is operator-agnostic, which means using a single global eSIM or iSIM in every device, and to be able to monitor and manage their global estate from a single cloud native platform.

That's essentially been our value proposition since 2013 when we were the first company to produce a multi-IMSI SIM card that was programmable OTA. That was long before the eUICC standard emerged, and now 95% of all SIMS we sell are ►

## **SPONSORED INTERVIEW**



eUICC eSIMs. I expect, with the introduction of iSIM, this is only going to accelerate enterprises' appetites to integrate connectivity into their products. With iSIM, the connectivity is actually embedded into the software of the silicon and, as with an eUICC eSIM, the operator is not directly involved. This means the first time they know that a device is using their data will increasingly be when it appears on their network, they will not be involved in the sale and will not do the end-customer invoicing. In other words, the threat is that they will not own the customer.

This is a business model change that I think is as significant as the move from enterprise software licences to software-as-a-service (SaaS) in that it disrupts the financial model of the current incumbents. But with change comes opportunity and the mobile network operators (MNOs) are reacting by white labelling new global IoT platforms that sit on top of their existing ones. This enables them to undergo a managed transition from their legacy platforms to a low cost model for truly global connectivity and higher margin value-added services.

However, the consequences of eUICC and eSIM are not restricted to the need for a new global platform. Truly global connectivity necessitates firmware changes to the device and this is not a skill that MNOs necessarily have.

**IoT Now: Can you explain this a bit more?**

**NE:** The promise of eUICC is that the buyer can use RSP to put different IMSIs, or profiles, from any MNO of their choice, into the device. This sounds like the holy grail for global connectivity and indeed, if you look at the marketing messages from several IoT companies, you would believe

that the eSIM together with the SGP.32 standard has suddenly solved all of the previous issues. Now every device can connect to any network and every eSIM vendor is suddenly a global provider of IoT solutions.

Not surprisingly the reality is a little different. To illustrate this let me use three examples that we have seen time and time again.

Firstly, there is the potential cost of the RSP. When the IMSI changes you are localising onto a new network. This requires a localisation interconnect from the vendor to the MNO. If you are being promised the ability to localise onto, for example, six networks globally has the vendor completed these interconnects or will you have to pay for them? In our case we have built the AnyNet Federation where we can localise a SIM OTA onto sixteen different networks. That's already in place.

Secondly, does your model support eUICC with firmware over the air (FOTA) capabilities? FOTA is needed to dynamically update the firmware so that it can work with each network. This means you have to test this in a lab environment before you deploy in each country and the standard way of doing this is the provision of a private network capability that mimics each network you want and tests the device ability to switch. Skip this step and you'll find out the hard way why firmware optimisation is so important.

And thirdly, have you thought about the access point name (APN)? Your device may switch but the new operator will use a different APN. Does your vendor have a solution to this? As part of a managed service **Eseye** ensures that our single global APN can be used on all the profiles meaning that our customers get localisation ►

**The promise of eUICC is that the buyer can use RSP to put different IMSIs, or profiles, from any MNO of their choice, into the device**



**Nick Earle**  
Eseye



**We think that by avoiding the traditional software development process and installing AnyNet SMARTconnect into their devices they can accelerate product launch by up to nine months**

without needing to reconfigure the device. This means the connection management can be dynamic and automatic.

There's a lot to think about and we can see that this is a major issue from surveys such as **Kaleido Intelligence's** Enterprise IoT study. The firm interviewed more than 800 companies who had attempted to implement an IoT project and asked them "in retrospect what was the number one difficulty that you had?" The answer wasn't global connectivity - 84% said it was device and hardware optimisation.

**IoT Now: We've talked a lot about cellular connectivity and how it will be accessed but what about the other connectivity options that form IoT connectivity?**

**NE:** There's certainly a need for systems that enable the best available connectivity to be utilised and it simply isn't good enough for many applications to address only cellular. In electric vehicles (EVs) for example, there is huge pressure to roll out charging networks. The problem is there's no revenue model for cellular in a home EV charger. The consumer wants it for free and ideally would connect using home Wi-Fi, but Wi-Fi doesn't penetrate walls particularly well. Wi-Fi HaLow may be the answer when it arrives to extend Wi-Fi range to 2km, but that is still some way off.

What's needed is a multi-network EV charger that flips between cellular and Wi-Fi depending on whether the signal is available and strong enough. That involves device intelligence that is resident in the device. This time next year, we'll be talking about smart sea containers on ships using Release 17 of the GSMA standard for switching between satellite communications at sea and cellular communications in port. There will be lots of new examples of devices that use multiple connectivity or radio access types (RATs) and this why earlier this year we launched Eseye AnyNet SMARTconnect.

AnyNet SMARTconnect is an on-device connectivity software solution that embeds intelligent, global IoT connectivity directly into any device. The software codifies Eseye's decades of connectivity expertise into an independent plug-in software module that partners and customers can simply integrate into their IoT or connected devices. They don't need to hire costly connectivity or firmware engineers to make this happen which allows IoT projects to scale up easily.

We think that by avoiding the traditional software development process and installing AnyNet SMARTconnect into their devices they can accelerate product launch by up to nine months. Customers and partners also benefit because AnyNet SMARTconnect supports global deployments, enabling a single SKU and includes the initial bootstrap and provisioning. This has created a new line of business as we transition to become a SaaS company and move away from the commodity end of the market. Our vision is to

become the leading SaaS connectivity company at both the platform and the device level and SMARTconnect enables us to implement the intelligence needed on the device.

On-device intelligence is fundamental to the success of IoT projects as a recent example clearly illustrates. One of our customers, **PharmaWatch**, which makes smart devices to track vaccine shipments, was subject to a 19-hour outage on the **Rogers** network in Canada last year. Typically, IoT devices would think they were still connected to the network because their connection to the nearest cell tower was still in place and therefore these devices would continue to try to connect to the network operator without success and so would be inactive.

For PharmaWatch, using SMARTconnect had enabled it to set a rule before the outage so that, if a device tries to connect three times in 30 minutes and fails, it would rotate to the next device-resident bootstrap and change operator. This rule solved the problem of the Rogers outage as PharmaWatch devices simply switched to another mobile network and continued to provide their service. This example really helps explain why the next big trend is device intelligence.

**IoT Now: What does your IoT Readiness Index cover and how can IoT organisations utilise it?**

**NE:** You can think about the implementation of a successful IoT project as a journey where stage one is the idea stage and stage nine is a fully sustainable IoT project. In between are multiple steps representing the work that is needed and, critically, what order they need to be carried out in. Examples include device design (stage three), proof of concept (PoC) (stage six) and defining the IoT commercial and operational model (stage seven).

When we engage with customers for the first time at Eseye most of them believe that they are ready for a PoC and ask for a quote for SIMs and data. But, because they have not focused on the device issues, there is a risk that, although a limited PoC will work, a full deployment won't. When this happens, their only recourse is to go back to the device stage and start again. This can mean a six-to-nine-month delay in the project plus all the internal issues that creates. Over the last couple of years, we have been tracking how often this occurs and found that it was 90% - nine out of ten customers did not know how important device issues are. This explains why 80% of Eseye's customers approach us after a failed IoT project. It's as if people are selling cars but there are no driving schools!

Clearly there was a pressing need to solve this problem. To achieve this, Eseye has pioneered and launched an industry-first IoT Readiness Level Index that is derived from **NASA's** Technology Readiness Level (TRL) framework.

Eseye's IoT Readiness Level Index aims to measure the maturity of IoT readiness within a business, ►



providing detailed information about the technical and operational readiness of an IoT device and project in the context of market best practices and similar projects within their industry vertical. It gives them a bearing as to where they are today, and how far they have to go to get to maturity. The IoT Readiness Index provides a very detailed assessment done in a formal workshop with the customer that assesses each stage on a scale of one-to-ten. It then reports back on where they are and what they need to do to progress. The industry needs a framework but there hasn't been one in IoT until now and the market is in massive disruption because of this.



**IoT Readiness Level™ (IRL) Index**

- 0 Idea
- 1 Concept
- 2 Scope
- 3 Design
- 4 Prototype
- 5 Pilot
- 6 Demonstration
- 7 Commercialisation
- 8 Optimisation
- 9 Sustainment

Once we have documented their personalised readiness assessment, we follow this up with a custom services proposal, which we call LaunchPad, to help them optimise their IoT journey and maximise the chances of success. We've implemented over a 1,000 IoT projects so we're bringing to the customer all of our accumulated knowledge, skills, best practices and expertise to their project. We measure how successful our customers are and it is reflected in our net promoter score (NPS) of +50 and customer satisfaction score of more than 98%.

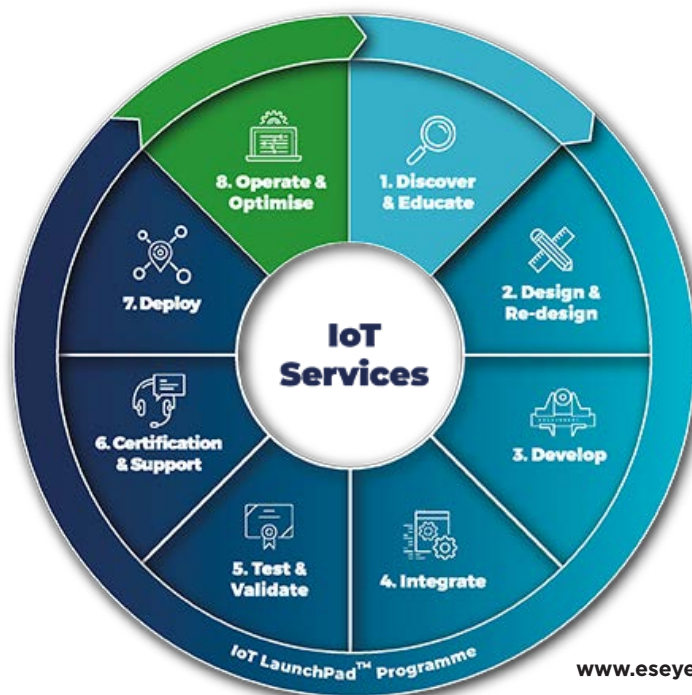
**IoT Now: Finally, how do you see this disruption playing out in the future?**

**NE:** Everyone in the value chain is readjusting their proposition and the big question is what their future role is going to be in the IoT landscape. There are two main models - value and volume. Volume is about that really low-cost offer to sell SIMs. It relies on very high volumes at very low cost, with a low-cost operating model. I expect most operators will continue to use their existing internal platforms to sell in this model to their existing markets. However, as operator agnostic eSIM-enabled global connectivity needs a different, value-based, solution I expect them to embrace new cloud native SaaS based solutions. In this way, mobile operators will participate in both value and volume models. But the challenge is that if you go up to value you need to have additional capabilities. How much do you know about hardware, about device intelligence, about firmware? Mobile network operators have not built

these capabilities so they will have to partner with companies like Eseye. This creates new opportunities for us, the ability to sell new solutions for the operator and offer more choice for enterprises.

All of this is happening right now because of the technical disruption of eSIM. It will be reinforced by the introduction of operator agnostic iSIMs and will be further accelerated with the increasing adoption of multi-RAT in each device. It's clear that a complete re-ordering of the IoT market is underway. For us at Eseye, this is really exciting because it creates a need for a full IoT solutions portfolio consisting of multi-RAT global connectivity, a single platform, device-resident intelligent software and a comprehensive services framework capability. By combining all of these things together, we believe we can enable customers to deliver every IoT project right first time from device to deployment. ■

**Eseye's IoT Readiness Index gives organisations a bearing as to where they are today, and how far they have to go to get to maturity**



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# IoT keeps healthcare cold chain temperatures under control

AmericanPharma Technologies monitors pharmaceutical and healthcare environments to make sure they're being operated in a safe and regulatory-compliant manner. Customers purchase its PharmaWatch offering as an IoT based System-as-a-Service software solution, which provides the sensor and communication hardware, data collection and storage. Eseye's connectivity solution enables the application to operate reliably over cellular networks. The company guarantees a high level of customer service, while unlocking the global data connectivity capabilities AmericanPharma needs to expand beyond the US



"We were spending increasing amounts of time fixing connection issues," says Casey Harris, the chief technology officer of **AmericanPharma Technologies**. "If connectivity was interrupted, we would collect the data and send it when communication was restored, but that was not ideal."

To address the problem, AmericanPharma developed an early first-generation cellular system which fixed many of the issues it had experienced with Wi-Fi, but unfortunately still included inherent limitations. A lack of roaming capability meant coverage was limited to the US, and the system could only operate within the **Verizon** network. After initial improvements, further efforts to enhance performance and reduce issues yielded diminishing returns and required increased resources.

"These issues were really putting a strain on our resources and limiting our success," explains Harris. "As our business grew, we needed a scalable and less support-intensive solution with near 100% uptime that worked worldwide."

## Overcome the hurdles

Following extensive research, AmericanPharma chose **Eseye** as its IoT connectivity partner. "We had many intrusive questions, and put out many hurdles," admits Harris. "Eseye was able to easily pass each one in our quest for the ideal partner. It even put us in touch with one of its current customers so we could ask them directly about their experience with Eseye as a partner. Eseye's forthcoming and transparent responses indicated the confidence it had in its solution, and its customers' success." ▶

What does the PharmaWatch monitor? Essentially the environment - temperature, humidity, CO2 concentration and differential pressure. It then notifies customers if conditions move outside defined limits, with alerting and reporting via a website and mobile app. It also offers in-depth compliance reporting and business intelligence to prepare customers for regulatory audits, with guidance on how to improve their operations.

Initially, the PharmaWatch environmental monitoring devices were connected to the cloud via Wi-Fi and relied on the customer's own networks to be able to send data. Customers' networks were often much less robust than the team expected, however, while organisations in the healthcare industry were continuously ratcheting up the security of their networks - with each change there was a risk that the PharmaWatch devices would no longer connect.

**"If connectivity was interrupted, we would collect the data and send it when communication was restored, but that was not ideal"**

## SPONSORED CASE STUDY



**Unlocking global expansion**

Installing Eseye’s AnyNet+ SIMs into its devices enabled AmericanPharma to eliminate the barriers that had impeded reliable cellular connectivity, and cellular roaming. Through its AnyNet Federation mobile network alliance, Eseye has agreements with every major mobile network operator in the world. Giving PharmaWatch access to a choice of more than 700 cellular networks in over 190 countries. Each multi-international mobile subscriber identification (IMSI) SIM can be loaded with multiple network user profiles, allowing the team complete flexibility in the carriers it uses, based on geography, or to take advantage of better data rates, for example. New networks and operators can be easily introduced with a click as new markets are conquered.

Embedding Eseye’s new AnyNet SMARTconnect intelligent connectivity software ensures the devices operate every time, and consistently, wherever they’re deployed. The software monitors a variety of constraints on the device and selects and optimises the right networks and protocols to suit device performance requirements. If connectivity is interrupted, SMARTconnect keeps data flowing by switching the SIM seamlessly to another network.

The enabling infrastructure behind the AnyNet+ eSIM and SMARTconnect software is Eseye’s Infinity IoT Platform, which provides centralised, detailed oversight of connection and device status across the entire estate. The AmericanPharma team can manage and optimise connectivity remotely for its PharmaWatch solution, on a device-by-device basis, with the platform giving them complete control, and allowing them to make changes and updates to their units over-the-air.



**Building device connectivity in from the start**

**Value added professional IoT services**

AmericanPharma took advantage of Eseye’s expert IoT Advisory Services in the early days of the partnership – including device design, device validation and certification assistance – to optimise connectivity and resilience in its existing units, as well as the new ones it was building. Its monitoring devices use an embedded system,

comprising a base board and a communications daughter board. To upgrade its legacy units, the team needed to be able to create a new daughter board with the latest LTE Cat-M1 low power wide area cellular technology.

“This was a new engineering approach for Eseye, but it was game,” says Harris. “We were able to licence the software from Eseye for the LTE module, taking advantage of Eseye’s deep experience while still using much of our existing system.”

Having signed the contract with Eseye in late 2021, AmericanPharma shipped its first PharmaWatch production units in the first week of August 2022. By the end of 2022, more than 1,200 devices were active on customer sites. “This was an exceptionally fast turnaround, in large part because of how good Eseye has been to work with,” points out Harris.

In July 2022, during the initial phase of commercial deployment, the network operator **Rogers Communications** suffered a massive network outage that affected all of its Canadian customers. While wireless connectivity remained active, the end-to-end data path was down. As a result, most IoT devices were offline for the full 19 hours.

This was not the case for PharmaWatch, though. All of the devices that had Eseye’s AnyNet SMARTconnect and AnyNet+ eSIM embedded were able to recover connectivity within 30 to 90 minutes, by redirecting traffic over the **TELUS** network. Minimum service downtime. Minimum disruption for customers.

**Benefits reported by AmericanPharma include:**

- 10x improvement in reliability
- Confidence in connectivity and competitive advantage
- Limitless potential to expand globally
- No juggling of contracts, carriers or management platforms
- A support-friendly solution
- Better compliance support for customers

“Our experience with Eseye has been exemplary,” says Harris. “Eseye has proven to be a top-notch partner throughout this project - response times are quick, and the answers and help typically go above and beyond. Thanks to Eseye’s AnyNet SMARTconnect on-device connectivity intelligence, our new system is orders of magnitude more reliable than Wi-Fi or the other cell system we previously offered. It is easier to sell, easier to install, easier to support and importantly easier to scale. We now offer the best, most-reliable, world-class system available for our market supported by global, resilient connectivity.” ■

**Having signed the contract with Eseye in late 2021, AmericanPharma shipped its first PharmaWatch production units in the first week of August 2022**



**Listen to the IoT Leaders PharmaWatch podcast**



# IoT connection innovation comes from a new breed of service provider

IoT is poised to take a disruptive leap into a new phase of the market. New capabilities in connectivity management and enablement offer the potential to sever the chord between IoT devices and cellular operators, opening up significant flexibility and stimulating choice. George Malim explores how IoT organisations will gain from the new connectivity landscape

**Now, a series of innovations have reached the market that have simplified connectivity, lowering barriers to entry and removing reasons to focus on solutions that only address connectivity**

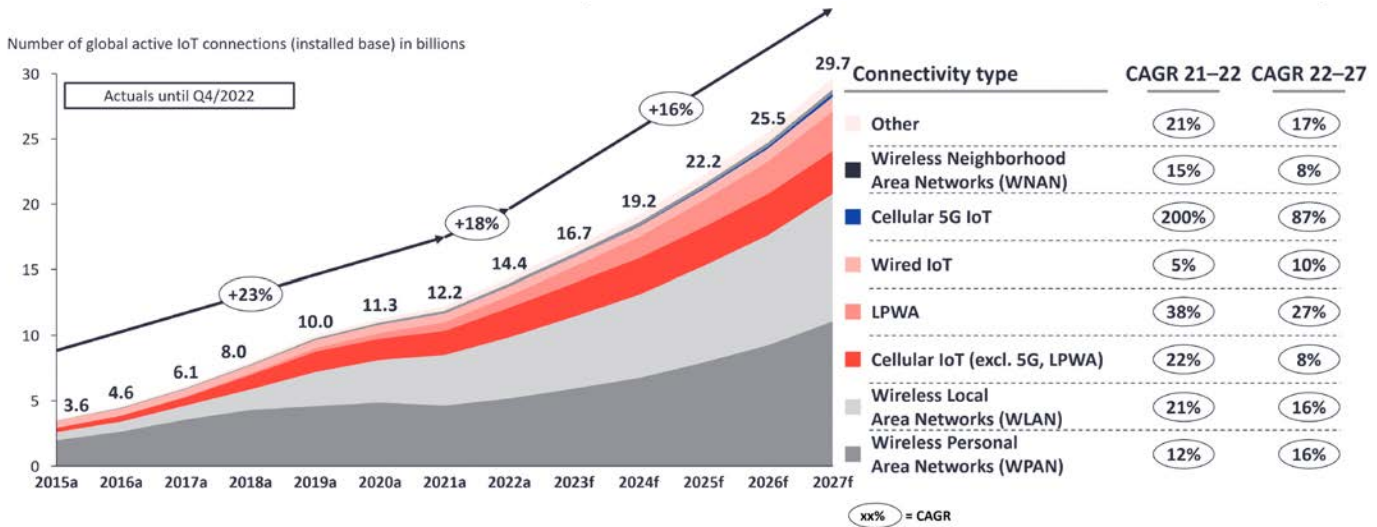
Unexpected moves are afoot in IoT connectivity. A year ago, few would have foreseen **Ericsson** effectively exiting its IoT Accelerator connectivity management platform (CMP) business by transferring it to **Aeris**. At the same time, rival **Cisco** has been taking its Control Center CMP through a substantial transition. In addition, there is movement in the mobile operator market, with **Vodafone** reportedly planning to spin out its IoT unit.

None of this paints a picture of a sector at peak performance and there are reasons behind these shifts. IoT connectivity simply isn't in demand in the volumes previously envisaged and it is becoming more and more difficult to turn a profit from providing connectivity and associated management platforms. The mass volumes predicted for IoT haven't arrived yet as the industry has been further held back by chip shortages and the war and this affects the thinking – and profitability – of service providers looking for hyperscale opportunities to make sense of thin margins.

And the margins are thin. **Transforma Insights** has highlighted that vendors in the CMP space are

stretched to support operator customers in a time of declining revenue per connection. It has become unrealistic to support operators' complex requirements when revenue can be as low as 20 cents per connection per year. In addition, the first-generation CMP providers developed their platforms at a different stage of IoT development. Then the focus was on abstracting away the complexity of connectivity provision, managing SIM cards and mobile network operator (MNO) relationships.

Now, a series of innovations have reached the market that have simplified connectivity, lowering barriers to entry and removing reasons to focus on solutions that only address connectivity. A new breed of service provider that offers more than access to connectivity and delivers the low-touch, highly automated processes that mobile network operators and mobile virtual network operators want has arrived. Aided by technical advances and improved standardisation, these services specialists are treading on traditional CMP providers' toes while gaining greater profits from associated or adjacent services within their service portfolios. ►



**Figure 1: Global IoT market forecast**  
Source: IoT Analytics

**Through thick and thin**

A two-speed market, characterised by Transforma Insights as thin and thick, is emerging in which a low-tier, high volume thin prepaid segment adopts highly cost effective CMP services with limited functionality while a thick sector, supported by CMP service providers that offer more complex features and holistic services, is emerging to serve the higher margin end of the market.

The good news is that there is growing room at both ends of this spectrum. **IoT Analytics** in its ‘State of IoT – Spring 2023’ report has revealed that the number of global IoT connections grew by 18% in 2022 to total 14.3 billion active IoT endpoints. In 2023, the firm expects the global number of connected IoT devices to grow another 16%, to 16.7 billion active endpoints. While 2023 growth is forecasted to be slightly lower than it was in 2022, IoT device connections are expected to continue to grow for many years to come. This is still far below initial outlandish projections of market size but still sufficiently encouraging in terms of sustained growth to justify continued investment.

**Growth but tight margins**

In its ‘Global Cellular IoT Connectivity Tracker & Forecast (Q1/2023 Update)’, IoT Analytics reported that global cellular IoT connections grew 27% YoY in 2022, strongly surpassing the growth rate for global IoT connections across all network types including Bluetooth and Wi-Fi. This growth is due to the adoption of newer technologies such as LTE-M, NB-IoT, LTE-Cat 1 and LTE Cat 1 bis, as older technologies such as 2G and 3G are phased out. Although 5G module shipments also grew more than 100% year-on-year in 2022, the growth rate is still slower than many had expected. In 2023, the top five network operators - **China Mobile, China Telecom, China Unicom, Vodafone**

and **AT&T** - managed 84% of all global cellular IoT connections. In terms of IoT revenue, the top five network operators make up 64% of the IoT network operator market, with **China Mobile, AT&T, Deutsche Telekom** (including **T-Mobile**), **China Unicom** and **Verizon** leading the market.

This paints a picture of greater choice in the cellular sector but a market dominated by a leading group of MNOs. That domination is likely to continue in terms of connection numbers but not necessarily in how MNOs engage with IoT. As mentioned earlier, the shifts in CMP provision are replicated by connectivity providers with an ongoing restructure at AT&T accompanying Vodafone’s reassessment of its IoT unit.

A similar strategic change is underway in the IoT platforms market in which major players have announced discontinuations. These include **Google** IoT Core, **Bosch** IoT Device Management, the **IBM** Watson IoT platform and **SAP**’s IoT services. The reasons for ceasing to offer these platforms are different from company-to-company but Transforma Insights cites the market dominance of **Microsoft Azure** IoT and **AWS** IoT in generic IoT along with the lack of profitability in the offered IoT services as reasons for them to discontinue offerings. Some of these companies have announced new directions which will see solutions created that are specific to particular verticals or that rely more on a few select partners to continue to support IoT initiatives. The **Google-Litmus Automation** partnership is one example of this.

Transforma Insights has provided a view from an un-named former IoT product lead at Microsoft which illustrates how the hyperscalers can, in effect, bundle IoT services with other elements of their enterprise portfolio. “IoT services themselves don’t make enough money,” the executive told ▶

*The good news is that there is growing room at both ends of this spectrum*



**Where connectivity meets reality, innovation is occurring and MVNOs appear to have renewed confidence**

Transforma Insights. “The services like AWS IoT Core and Azure IoT Hub are expensive to build and maintain and by themselves they are likely not profit-making.”

Some of these tensions are likely to be replicated in the connectivity management platforms sector, causing a rethink of capabilities offered and a rush to thick or thin scenarios to preserve profitability. Commenting on this trend, Matt Hatton, the founding partner of Transforma Insights, says: “This should not be seen in a negative light. It’s part of a wider introspection within the IoT space, with organisations as diverse as Bosch, Google, IBM and SAP rethinking their approaches to the market to reflect the world as it is, rather than how they anticipated it would be.”

**A new breed of service provider**

Where connectivity meets reality, innovation is occurring and MVNOs appear to have renewed confidence. In its latest ‘Communications Service Provider IoT Peer Benchmarking’ report, Transforma Insights has uncovered a vibrant IoT connectivity sector.

“The MVNOs are where much of the innovation is happening, and it’s notable that many MNOs are seeking to harness MVNO energy for their own operations,” adds Hatton.

The shift in attitudes in the IoT connectivity is the fruit of a series of related but separate innovations hitting the marketplace. The maturity of embedded SIMs couple with greater appetite for iSIMs and the acceptance of the eUICC standard breaks the traditional link between the mobile network operator, the SIM card and the device. With no physical SIM card, a third party service provider can provide an IoT organisation with connectivity that is embedded or integrated into

the device at the point of manufacture and without the knowledge of an MNO.

The connectivity, as usual, will be enabled by MNO networks but the networks won’t know anything about the device until it connects to their network. They will monetise their connectivity via the service provider who will pay for it and for bootstraps so devices can connect to networks but MNOs face a substantial loss of control. The path towards this is being eased by the introduction of GSMA’s SGP.32 specification for IoT devices which is set to expand the ecosystem of available eSIM profiles while also reducing the complexity of technical integration.

**Kaleido Intelligence** expects this to stimulate uptake of eSIM and iSIM and has forecast that total active xUICC connections, composed of eSIM and iSIM will reach close to 4.5 billion in 2028, representing growth of 63% CAGR between 2023 and 2028.

**Dramatic simplification**

The research firm’s Mobile Connectivity Data Hub H1 2023 research found that the forthcoming enablement of eSIM in mid-range smartphones, in addition to the upcoming publication of the SGP.32 specification for IoT eSIMs will help accelerate the market for eSIM activation rates. The research found that the SGP.32 specification for IoT devices, which borrows elements of the existing specification for consumer devices, will significantly impact some of the pain points currently associated with eSIMs using the M2M specification. In addition, this will expand the ecosystem of available profiles, while reducing the technical integration pain points that have plagued the market for IoT devices using the M2M specification thus far.

“2023 is expected to represent a tipping point for ►



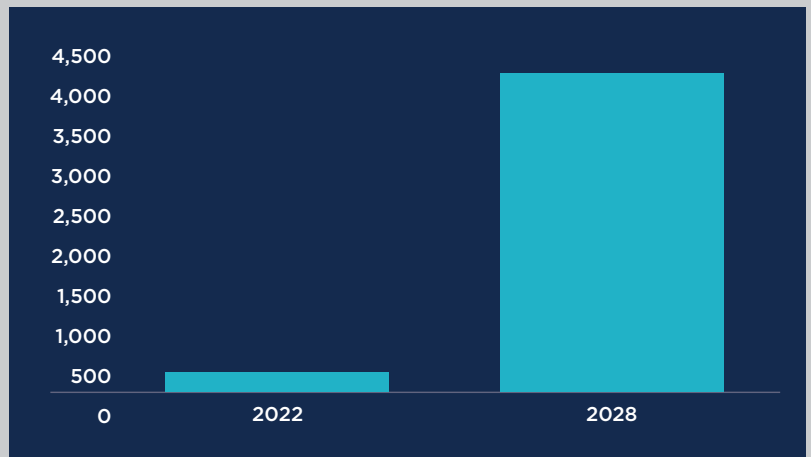
realising the original vision and value for eSIM, particularly in the IoT domain,” confirms Steffen Sorrell, the research lead at Kaleido Research. “In essence, eSIM as a long-term bet for IoT will become much more valuable, while the onboarding of eSIM in mid-range smartphones will dramatically increase the installed base for handsets, while encouraging operators to refine their eSIM onboarding processes and eSIM connectivity strategies.”

**Device intelligence**

Awareness and acceptance of new subscriber identification technologies, growing maturity among IoT organisations and the continuing imperative to simplify IoT connectivity is arriving alongside heightened realisation that device intelligence is of greater importance than previously thought. Device intelligence enables decisions to be made when the device has been deployed, it enables device data to be acted upon and greater efficiency or improved performance to be achieved.

The confluence of these needs is, in turn, being supported by a new breed of connectivity management service provider. This isn't a re-run of the traditional CMP, nor is it a return to MNO dominance. Instead, it involves the harnessing of innovation and experience from services providers that have deep understanding of device attributes, network technologies and the intricacies of operating global connectivity.

As connectivity shifts further into the software domain in terms of embedding identity and connectivity into devices, the barriers to market entry are lowered for innovative providers of services that enable and support IoT connectivity. This is set to kick-start a new wave of disruption that centres on what can be accommodated on



**Figure 3: Active eSIM/iSIM connections in millions 2022 and 2028**  
Source: Kaleido Intelligence, 2023

IoT hardware playing an increasingly important part in the connectivity process.

Today, IoT is starting the transition from the traditional approach of sponsored roaming and physically switching SIMs to a new market based on eSIM, and other choices for localisation. These capabilities need to mature and there is a lack of clarity regarding which direction to take for customer organisations. However, as the new technologies bed-in and mature, the choices will align more closely with specific IoT deployment types to the benefit of all involved. Selecting a provider that can ensure your device can handle the demands of xUICC connectivity, can manage multiple radio access types globally and can simplify your device design, configuration and deployment will answer many of the requirements that IoT organisations have today and for the foreseeable future. ■

**2023 is expected to represent a tipping point for realising the original vision and value for eSIM, particularly in the IoT domain**



# t42 guarantees consistent connectivity on the move

Israeli-based t42 specialises in wireless systems that allow the remote GPS tracking, monitoring and protection of a variety of assets – mobile and fixed – from anywhere, at any time. Partnering with Eseye enables t42 to provide robust global IoT connectivity for its devices, which are typically installed in vehicles, shipping containers and other units that are often on the move



t42's Helios interface

Sold in more than 50 countries, t42's Helios GPS system provides users with automated real-time location and management of vehicles and drivers. The offering was developed in 2004 in response to the issue of vehicle theft, as an alternative to alarms and radio frequency-based location systems that required costly infrastructure. By combining GPS technology and cellular GSM technology in a wireless unit, the t42 team created a simple and effective solution which has evolved to become the innovative IoT-powered system it is today.

Customers can easily and efficiently monitor and manage their devices and assets via t42's web-based Control Centre app, which displays fleet, cargo and team members on one detailed map. The app also triggers an immediate and appropriate response in emergency situations.

## Coverage gaps block growth

t42's original connectivity partner lacked the capability to provide the reliable and comprehensive cellular coverage the company required to expand its footprint and support global customers, in particular those in the valuable US market.

"Our previous connectivity partner was mainly focused on roaming, which was costly for customers and carried the risk of the connection dropping," says Maxim Perry, the vice president of sales and marketing at t42. "They also had no localisation solution to overcome the permanent roaming ban for IoT that a lot of countries are enforcing."

The search for a new partner was also driven by the winning of a major new customer: **Zero Motorcycles**, which manufactures cutting-edge electric vehicle (EV) motorcycles that it ships worldwide. Zero planned to integrate the Helios system into its SRF motorcycle, not only to track and secure the vehicle when it was in transit and in use, but also to offer advanced features that would enhance the riding experience. These include real-time data on the motorcycle's location, speed and battery status, and safety warnings in the event of an accident or theft attempt. The need to deliver on this capability made consistent, high-performance IoT connectivity – whether the vehicle was stationary or moving – a non-negotiable. ▶



The Zero SRF

## SPONSORED CASE STUDY



**Setting the wheels in motion**

On meeting the **Eseye** team in 2020, t42 recognised that Eseye’s multi-international mobile subscriber identification (IMSI) AnyNet+ eSIM had the potential to meet its customers’ unique and exacting demands. It requested a trial to test the SIMs within its devices.

Through its AnyNet Federation alliance, Eseye has agreements with every major mobile network operator in the world, giving access to more than 700 networks in over 190 countries. Each SIM can be loaded with multiple network user profiles, allowing t42 the flexibility to localise each device based on geography, as well as to switch providers to take advantage of better data rates, for instance.

t42’s devices are guaranteed connectivity uptime of almost 100%. The AnyNet+ eSIM can switch immediately and seamlessly to another network if connectivity happens to be interrupted.

Eseye’s Infinity IoT Platform provides t42 with centralised visibility and control over connection and device status across its entire deployment. And crucially, the ability to make changes and updates to its units over-the-air. It was important to t42 that it – and its customers and end-users – could continue to use its proprietary Control Centre platform to manage the devices and assets being tracked. Eseye’s application programme interfaces (APIs) made this possible, allowing the two platforms to be flawlessly integrated.

“At t42, we specialise in cutting-edge, real-time remote tracking solutions for vehicles, assets and containers,” adds Perry. “Our devices are always on the move, so we require connectivity that’s both fast and reliable. That’s why we’ve partnered with Eseye, whose suite of IoT connectivity solutions is unrivalled in the industry.”

**Smooth onboarding**

The t42 team also took advantage of Eseye’s IoT Device Validation services. This made sure the Helios devices were compatible with Eseye’s unique AnyNet+ eSIM technology and back-office systems, and with the embedded universal integrated circuit card (eUICC) software which enables users to change network provider without physically swapping a SIM card.

**Proof before promise**

Eseye helped t42 during the trial phase with proofs of concept and pilot tests. “We sent sample devices to customers to trial in the field, and Eseye provided support to make sure everything was working,” explains Perry. “Eseye’s reliable and stable connectivity service, and enhanced capability with localisation, made the difference.”

To date, t42 has deployed 2,500 Helios devices with Eseye’s AnyNet+ eSIMs installed, keeping vehicles and their owners in multiple markets well-informed and safe. The two partners are now shifting their focus towards supply chain IoT, with a long-term vision to incorporate tracking and monitoring capabilities into every shipping container across the globe.

**t42’s devices are guaranteed connectivity uptime of almost 100%**



**Helios TT tracking device**

**Benefits of the partnership with Eseye reported by t42 include:**

- Significant new global business wins
- Flexibility and agility
- Reliable connectivity
- Speedy roll-out
- Improved fleet and asset management
- Optimal customer experience

“Thanks to Eseye’s AnyNet Federation - the largest mobile network partner ecosystem - we’re guaranteed uninterrupted uptime,” says Perry. “Plus, the AnyNet+ SIM provides unparalleled connectivity resilience. And with Eseye’s high-speed MPLS network, our data is always secure and encrypted. We’re thrilled to have Eseye as our strategic partner and look forward to growing our business together. With Eseye by our side, we’re confident we can scale our operations and meet the needs of our customers with ease.”

“t42’s cloud-based analytics and alert system provides actionable insights using real-time data gathered from multi-sensor IoT tracking devices,” adds Anand Gandhi, the senior vice president of global enterprise sales at Eseye. “Worldwide coverage and localisation when needed was crucial for t42, not only to comply with local legislations but to ensure it provides state-of-the-art services to its customers. By choosing Eseye, t42 has solved its worldwide connectivity challenges and can concentrate on its global expansion plans.” ■



**Listen to the IoT Leaders t42 podcast**



# IoT services market takes off to aid widening deployments

Organisations are increasingly looking towards deployment services to aid their IoT strategies and roll-outs, to get to market quicker in an efficient way. Antony Savvas looks at how IoT services can aid device simplicity and cost-efficient connectivity

Partnerships are essential in IoT services when delivering the best solution to end customers. IoT connectivity services firm **Eseye** has struck an agreement with **Orange** Wholesale France to enhance its global offering. Orange Wholesale France has extensive roaming agreements specifically for IoT use cases across many countries and regions. From the deal, Eseye increases its footprint and augments the technical localisation agreements it already has in place in regions such as North America, Brazil and Turkey.

“Adding the Orange Wholesale offering to our unique technical localisation capabilities means we are able to offer wide-ranging access to local networks and roaming partners,” says Adam Hayes, the chief operating officer at Eseye. “We pioneered the localisation trend, solving IoT problems in difficult jurisdictions such as North

America and Brazil. We know how much engineering investment and work is involved in meeting customers’ evolving IoT deployment needs.”

Yannick Decaux, the senior vice president for mobile wholesale and interconnection at Orange Wholesale France, adds: “Eseye is an experienced, deeply technical IoT connectivity solution provider and therefore the perfect partner for us to engage with via our global connectivity agreement.”

Eseye has also just launched its IoT Readiness Level (IRL) Index, an assessment framework to help businesses integrate and expand IoT technology in their operations. And it has introduced IoT LaunchPad, a subscription-based service that provides a range of specialised IoT services tailored to each customer’s project. ▶



### Joint solutions

Further illustrating the need for partnerships when it comes to delivering efficient IoT deployments, **NTT** and **Cisco** have announced a collaboration to develop and deploy joint solutions that empower organisations to improve operational efficiencies and advance sustainability goals at the edge. Using NTT's edge as-a-service portfolio and Cisco's IoT capabilities, solutions developed by the two companies aim to offer real-time data insights; enhanced security; improved decision making; and reduced operational costs through predictive maintenance, asset tracking and supply chain management capabilities.

"We are delivering a powerful portfolio of repeatable services that can be tailored to meet customer demand," says Devin Young, the senior vice president of group enterprise IoT products and services at NTT.

Samuel Pasquier, the vice president of product management for industrial IoT networking at Cisco, adds: "Transitioning customers to this IoT as-a-service model will allow them to quickly realise business benefits across industries."

As a use case, NTT and Cisco are already supporting **Compagnie Intercommunale Liégeoise des Eaux (CILE)**, a public water distribution company located in Belgium. It has deployed thousands of Cisco low-power wide area networking (LPWAN) sensors across CILE's infrastructure to provide remote visibility that helps improve operational efficiencies related to water quality, consumption, sustainability, distribution and maintenance, all delivered as a managed service.

"We provide critical infrastructure for 24 cities in Belgium, which means efficiency, security and reliability are key," says William de Angelis, the chief information and chief data officer at CILE. "We now have real-time insights into our facilities and distribution networks, including the faster detection of leaks, allowing us to respond to issues instantaneously."

### Economy of Things

**Vodafone** and investment firm **Sumitomo** have established a standalone business to drive the development of an 'Economy of Things', through IoT security services. Within such a global ecosystem, vehicles, devices and machines can interact and transact with each other via a secure digital platform, without human intervention, but with owners in full control, say the partners.

"Businesses across multiple sectors can instantly launch new products and create new revenue streams, while consumers will be safe in the knowledge they are dealing with verified devices from a trusted authority," say the two firms.

Vodafone established its Digital Asset Broker (DAB) platform last year to help extract value from connected devices. Rather than build their own complex system, customers can use the platform to assign a unique digital identity to any device. This enables it to seamlessly communicate and transact securely with other devices using blockchain technology, where the wallet and payment services are secured by the mobile SIM controlled by the user.

Vodafone has transferred its DAB platform, as well as intellectual property, contracts, technology and software, into the new business. In turn, Sumitomo will invest in the business and work with Vodafone to attract additional investors, partners and customers. The parties intend to roll out DAB in a phased approach, initially targeting the automotive and transport sectors in Germany and the UK, and then other European countries and North America at a later date.

### Blueprint partners

**Amdocs** and **Microsoft** have developed blueprints for edge and IoT services at Amdocs' Americas 5G Experience Lab in Dallas, Texas. The solutions being tested are built on the Microsoft Azure private multi-access edge computing (MEC) and Azure Private 5G Core technologies, and are designed to address the various needs of smart cities, augmented reality maintenance and training, and other IoT service segments. The Experience Lab can also be used by enterprises and service providers to experiment in various areas, including private wireless networks, premium 5G services, cloud services, the future of work, Industry 4.0 and security.

The Lab embraces industry standards and organisations such as OpenRAN, the Telecom Infrastructure Project (TIP), 3rd Generation Partnership Project (3GPP), the TM Forum and others.

Anthony Goonetilleke, the group president of technology and head of strategy at Amdocs, says: "Our strategic engagement with Microsoft to maximise the potential of cloudification at the edge, together with the power of open, intelligent networks, will create an amazing playing field for the next generation of enterprise experiences and monetisation." ■

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***"We are delivering a powerful portfolio of repeatable services that can be tailored to meet customer demand"***

**Devin Young**



# Biofourmis shapes the future of remote patient care

Biofourmis is on a mission to bring the right care to everyone, everywhere. Its ground-breaking platform technology combined with a wearable device allows care teams to continuously manage patients via an IoT-connected device

While **Biofourmis** solutions are device agnostic, the company saw an opportunity to have a device of its own and developed the wearable biosensor device Everion, which is worn on the upper arm and measures vital signs and biomarkers. These include: temperature, oxygen levels, blood pressure and respiration rate.

Using an app on the patient's smartphone, the device sensors collect real-time data and send it via the cloud to the Biofourmis platform, where clinicians can access it. The system alerts the clinician if the patient's condition changes, so they can quickly intervene and, over time, the detailed data reveals patterns and trends. Built-in artificial intelligence (AI) and machine learning capabilities enable the solution to tell if an individual's condition might be deteriorating and advise them to seek medical attention. This showcases truly personalised and predictive power in action.

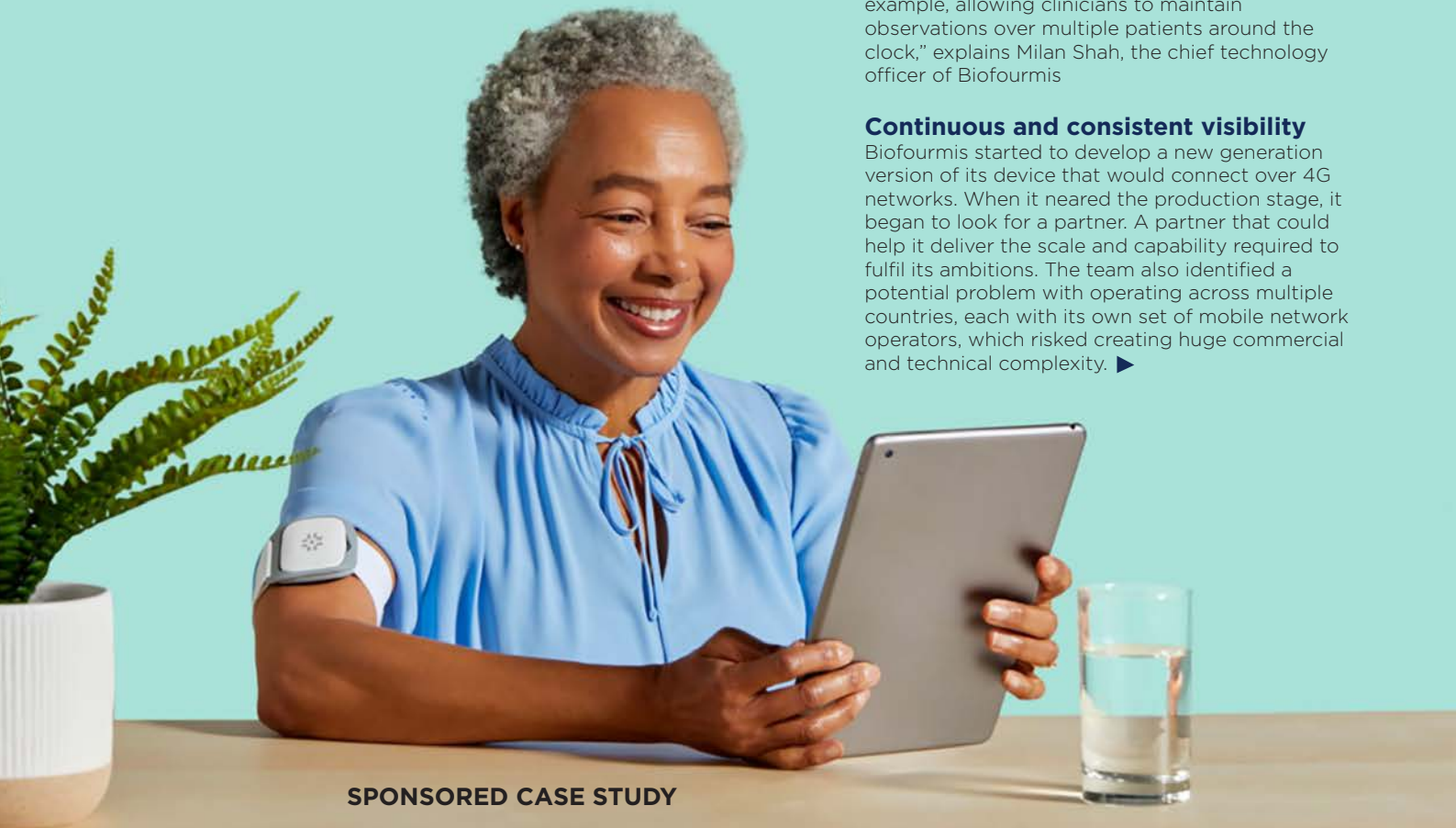
The ability to manage the wearer with continuous data, and assess the patient data in real-time, is critical to the effectiveness of the solution. The technology needs to work wherever the patient is - at home or on the move.

Biofourmis encountered issues with Bluetooth connectivity blindspots that would cause the app and connected device to unexpectedly disconnect. To solve this problem, Biofourmis embarked on a project to expand from Bluetooth only connectivity to cellular connectivity over 4G networks. The urgency increased as Covid-19 hit, and the huge potential of the Biofourmis model was recognised.

"Countries realised they could use our products to support Covid management protocols, equipping patients with a device that would automatically take their temperature four times a day, for example, allowing clinicians to maintain observations over multiple patients around the clock," explains Milan Shah, the chief technology officer of Biofourmis

## Continuous and consistent visibility

Biofourmis started to develop a new generation version of its device that would connect over 4G networks. When it neared the production stage, it began to look for a partner. A partner that could help it deliver the scale and capability required to fulfil its ambitions. The team also identified a potential problem with operating across multiple countries, each with its own set of mobile network operators, which risked creating huge commercial and technical complexity. ►



SPONSORED CASE STUDY



“We were advised to look at aggregators – providers who had access to a wide range of networks in different markets,” says Shah. “We shortlisted a few and **Eseye** came out on top.”

Eseye’s mobile network alliance – the AnyNet Federation – gives customers access to more than 700 cellular networks around the world, through roaming agreements with major operators in 190 countries. One of the attractions of Eseye’s proposition was its ability to localise each device to the territory in which it will be operating, via the embedded AnyNet+ eSIMs. Carriers can be selected, switched and optimised remotely on a device-by-device basis. This helps Biofourmis avoid issues with permanent roaming, which is prohibited in an increasing number of markets as governments seek to ringfence network capacity for domestic customers. In addition, the AnyNet+ eSIM can be loaded with multiple network user profiles, allowing the device to be switched instantly to an alternative cellular network if connectivity drops.

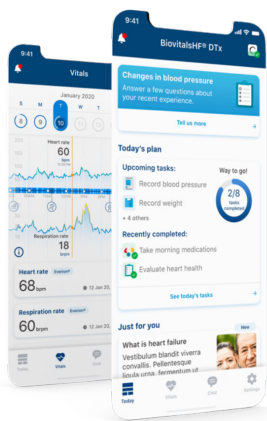
“It’s amazing to see how it’s worked out in real life,” adds Shah. “The device powers up and seamlessly connects. The Eseye eSIM makes a secure connection between the device, the network and our cloud providers, database and platform. It has been great to see that with improved connectivity we can reach more people around the globe who otherwise may not have access to this level of care. That has been one of the biggest advantages with Eseye.”

To make sure connectivity was built-in correctly from the start, the Biofourmis team utilised Eseye’s expert device validation and testing services during the pre-production part of the process.

**Pull everything together with the right partner**

In the fragmented and complex health tech market, aligning different partners behind project goals is essential. Here, the Biofourmis team valued Eseye’s ability to step beyond the role of a simple connectivity provider into the broader remit of a specialist IoT integrator.

Shah explains: “At various points in the project cycle, we have at least five parties involved: the network provider, device provider, aggregator, the lab providing certification, and the supplier of the test equipment they use. Unless everything works together the whole IoT ecosystem will break. Eseye helped us to achieve the necessary coordination.”

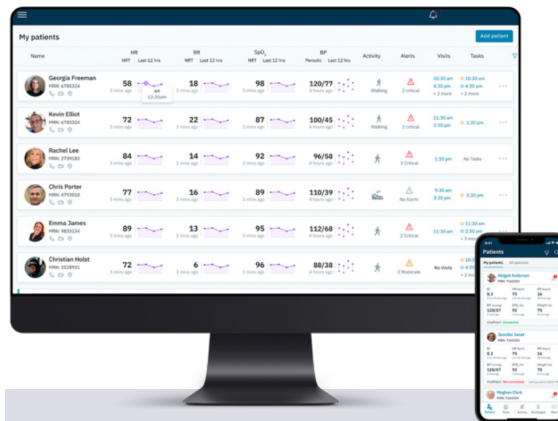


Once the core number of devices out in the field is sufficiently large, Biofourmis plans to start using Eseye’s integration APIs to manage them as a group. “We’re looking forward to tapping into Eseye’s APIs in the future, integrating them into our products so that the devices can be managed centrally,” confirms Shah.

**The global long-term vision**

The first commercial deployment of the new generation of devices are being rolled out in 2023. Use cases are currently within the clinical trials space, with pharmaceutical companies using the solution to monitor the effects of new drugs in trial participants, often across several territories, and supporting the transition of patient care from hospital into the home.

“The coverage has been fantastic and reliable,” says Shah. “In the countries in which we operate, specifically US and Singapore, there have been no connectivity issues. One of our priorities is to achieve the level of cellular coverage we require in our expanded global markets. Again, we will look to Eseye for help, as the absolute expert in communications technology.”



**Benefits reported by Biofourmis include:**

- Continuity of service, driving better health outcomes
- 160,000 patients have used the platform since 2021
- Infinite scalability to deploy product in new markets
- Reduced complexity
- Enhanced security of confidential patient data
- Remote control over devices and connectivity

“What has made our project successful is the sheer level of expertise Eseye brings to the table,” explains Shah. “It’s an excellent partnership. There are significant considerations in picking the right partner to help you from design to deployment – and every day we are very thankful Eseye’s remarkable support to help us bring innovation to patient care.”



**Listen to the IoT Leaders Biofourmis podcast**

**Eseye’s mobile network alliance – the AnyNet Federation – gives customers access to more than 700 cellular networks around the world, through roaming agreements with major operators in 190 countries**

A man with grey hair and a beard, wearing a light-colored suit jacket, is looking down at a smartphone in his hands. He is standing next to a car, with his hand on the steering wheel. The background is a blurred, modern interior with warm lighting.

eseye

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