



2020 and Beyond: What's next for IoT

The impending transformation that will
unlock the potential of IoT

Predictions for 2020 and Beyond: What's Next for IoT?

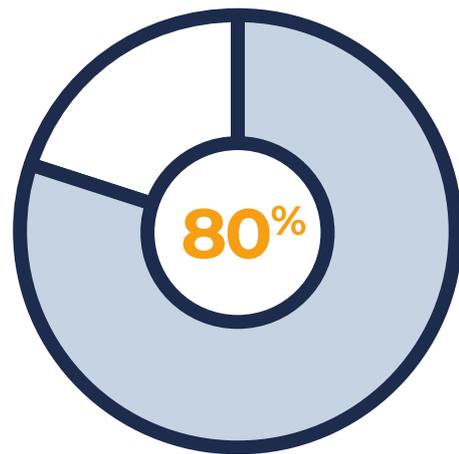
The Internet of Things (IoT), a key enabler for digital transformation, has received vast amounts of media coverage and some extraordinary market predictions. In fact, several IT analysts and other market commentators have frequently predicted that by 2020 there would be 50 billion IoT devices deployed around the world. Yet, today, around 9 billion IoT devices are connected including about 8 billion mobile phones and home devices. So, what happened to the rest?

For a market that was set for such rapid adoption and growth why does IoT appear to be failing and what does the future hold? How can this innovative technology deliver on its promise and what are the challenges for the global deployment of IoT? This paper explores some of the reasons why IoT's potential hasn't yet been reached and how emerging IoT capabilities, supported by a new breed of partnerships, is needed to change the face of IoT in 2020.

1. Hardware becomes relevant again

Many may remember tech entrepreneur Marc Andreessen who was famous for saying 'software is eating the [hardware] world'. It might have been true at the time for the centre of the network, but today with growing cloud implementations there are fewer data centres. As the adoption of IoT continues to grow in 2020 we predict the opposite to be true and that we are entering a time when 'hardware eats software'.

In IoT deployments 80% of the data and processing is at the 'edge' of the network. This is where the 'things' and sensors are and where data is captured. However, to make sense of it all, without the expense of having to back haul the data into the heart of the network, it needs to be processed on the edge. And, edge processing not only needs hardware, but also specialist hardware knowledge to help you ensure your IoT devices function and capture data in the way you intended.



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An IoT device is not simply a PC or tablet, but a custom piece of hardware running an IoT application that is linked to thousands of sensors and all using different protocols like SigFox, LoRaWAN, WiFi, etc. In addition, delivering seamless and reliable cellular connectivity is much more complicated than just inserting a SIM card. To deliver successful deployments organisations need a strong understanding of how to optimise IoT hardware from circuit boards to firmware.

We recognise that one of the fundamental reasons that IoT projects fail is because the importance of hardware has been vastly underestimated. At Eseye hardware design is a core part of our value add and we have completed over 200 design projects for our customers. Based on this experience we predict that IoT companies with hardware expertise or who specialise in hardware will become the prerequisite for the successful delivery of all IoT projects in 2020 and beyond.



IoT companies with hardware expertise will become the prerequisite for the successful delivery of all IoT projects in 2020

2. Rapid growth of bundled silicon

Another major market disruptor in 2020 will be the rise of silicon firms integrating IoT capability directly into modules or hardware. Bundling IoT capability at the silicon level significantly simplifies the set up and deployment of IoT devices. No longer will end users need to rely on having access to technical expertise and will benefit from the elimination of several complex technical and commercial steps in the process.

The real game changer is that once the device is activated it should automatically connect to any network in the world and start provisioning data to either their on-premise solution or any one of the hyperscale Cloud providers. So essentially, switch it on and with 'zero touch' the data is securely and automatically provisioned into their cloud platform of choice. This enables companies to focus on analysing and maximising the data outputs to achieve the right business outcomes, rather than being distracted by technical issues. Our prediction is that the incorporation of secure IoT connectivity into silicon at the point of manufacture will go a long way to streamlining the IoT deployment experience. The recent launch of Intelligent Cloud Connect for AWS by Eseye and Gemalto is an early example of this new innovation.



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3. Roaming falls out of favour

A key precursor to the widespread adoption of IoT is the ability to quickly and simply connect devices anywhere in the world. Some suggest this exists through global roaming, but instead it highlights two significant problems that make roaming completely impractical and no longer commercially attractive for Mobile Network Operators (MNOs).

The financial model is collapsing for two key reasons. Firstly, the EU mandated that roaming rates should be harmonised to a 'penny per megabyte' throughout the European Union; yet these roaming charges apply not only to voice and data networks but also IoT. Secondly, as new capabilities are enabled by 5G there is a growing surge in data volumes used by devices for video, and this will increase further with the development of Augmented Reality (AR) and Virtual Reality (VR) functionality.

This is what we term the 'net neutrality argument'. MNOs invest vast amounts of CAPEX into their infrastructures, but due to roaming they are seeing their margins reduced. This is resulting in permanent roaming restrictions which are being tightened country by country.

Now with a growing number of MNOs implementing restrictions like these, it could mean that after three months an IoT device could be taken off the network. So, for IoT customers with fixed devices around the world this may result in the inability to use some networks beyond the short term unless you use a localised SIM. The impact through 2020 as roaming falls out of favour could see organisations having to turn to global 'super' Mobile Virtual Network Operators (MVNO's) that have multiple global MNO connectivity contracts in place based on localisation of the data, not roaming, in order to effectively deploy and localise IoT devices.



4. The birth of a ‘Star Alliance’ Federation model for IoT

So far, the number of ‘things’ connected, as mentioned earlier, has fallen far short of the 50 billion predicted. This is mainly due to so many companies underestimating the complexity involved in making IoT work. Simplifying IoT by embedding capability into the device goes a fair way to solving the problem. Switch it on; it just works. Yet, what role do the MNOs play in this new world? Are they suddenly in danger of becoming a commodity?



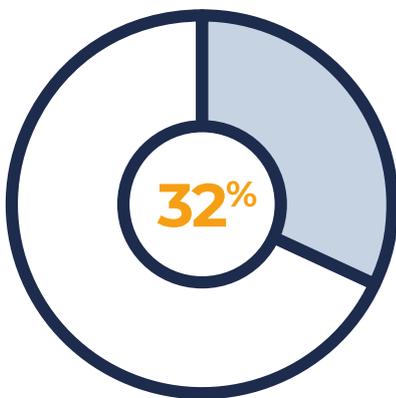
[Nick Earle Eseye's CEO says](#), “We predict that as we move into 2020, we will see the rise of a ‘federation of MNOs’, or to put it another way the ‘Star Alliance’ of the airline world will come to IoT. With MNOs under pressure from silicon, and with increased pressure on their commercial models there is a growing need for them to compete for and deliver global IoT projects. A more commercially favourable and collaborative approach is required, and this is what we have announced with the AnyNet Federation.*”

To capitalise on the future growth in IoT, MNOs will have to start working together, collaborating on and sharing revenues from global IoT deployments. Much like the Star Alliance where you would buy a single air ticket, travel around the world and pay once; a new business model will emerge for MNOs. If one MNO sells a global deal in one country, each MNO in the federation will then deliver the traffic requirements in their own country. Adopting this approach, the revenue would be shared between federation members as devices are localised around the world, based on connectivity and data usage. Not only that, but more importantly the customer needs for delivering global IoT would be met, resulting in single pane of glass management, one bill, and one support contract. We believe that a federation-led approach protects the economic model for MNOs and enables them to exploit the future growth in IoT.

5. Fuelling the digitisation of the High Street

Online sales increase year-on-year as well-known retail brands suffer. We can all recognise the disruption that online technology has had in the retail market and ultimately the high streets. Yet we predict that the digitisation of the high street through 2020 using interactive IoT devices and smart, interactive, point of sale (POS) and vending machines will start to entice shoppers back. In addition the greater operational efficiencies and consumer insights that can be achieved through intelligent vending will see organisations be able to fine tune their vending devices to drive profit.

This is likely to be influenced by the rising population of tech-savvy, Generation Z, digital native shoppers demanding more frictionless shopping experience. 'According to new analysis by Bloomberg of United Nations data, Gen Z will account for 32 per cent of the 7.7 billion global population by the end of 2019.' Spending more time than any other generation on their mobile devices this is already leading to interesting developments in the use of IoT, AR and VR in high street shopping.



Gen Z will account for 32 per cent of the 7.7 billion global population by the end of 2019 driving interesting developments in the use of IoT



Although the deployment of IoT has regularly involved sensors capturing data and being used in applications such as track and trace, we know that some of the best IoT case studies have very different applications and business outcomes. Costa Express is a great example of how a successful IoT deployment can significantly disrupt a traditional market. As Costa Express continues its global roll out of vending machines, at a staggering rate, other coffee companies struggle to keep pace. Particularly when Costa Express is able to successfully deliver the same barista coffee experience in a one square meter of vending machine. That said, it's not just a coffee machine, it is also a large digital display with the ability to deliver highly targeted advertising.

So, as we move into 2020, we believe that the digitization of the high street will see the mass personalisation of the shopping experience, using dynamic advertising, as well as new and innovative IoT-enabled interactive customer experiences.



The digitization of the high street will see the mass personalisation of the shopping experience

6. ARPU for IoT will rise

We predict that as IoT adoption grows, along with increasing use of video and the digitization of the shopping experience that Average Revenue Per User (ARPU) will rise based on sizable increases in data requirements. Many MNOs currently believe that data rates and ARPU is coming down due to the collapse of data roaming, but this is yet another counterintuitive prediction. We are witnessing IoT devices regularly processing over a hundred to two hundred gigabytes of data a month.

Video is today's killer app and is one of the key reasons that we see ARPU rising and it will continue to drive ARPU rates up. As we live in an increasingly mobile-driven and digitally connected culture, brand engagement and loyalty will rely on more personalized digital experiences and interactivity enabled through connected devices. It is our prediction that increased volumes of digitally driven data will see ARPU continue to rise in 2020, potentially doubling new projects in 2019.



Increased volumes of digitally driven data will see ARPU continue to rise in 2020

7. Successful global eUICC implementation needs to be network agnostic

Long applauded as the next evolutionary step to unfettered mobile connectivity the Embedded Universal Integrated Circuit Card (eUICC) was going to solve many problems. It would negate the need to migrate profiles between SIMs, it would enable everybody to work together and open a world of opportunities. Great idea, but this has been impacted with a number of implementation challenges.

Will eUICC become the dominant standard? Absolutely. Will devices be able to switch using eUICC between mobile network operators? Yes definitely. So far, so good. It seems to solve all the problems, but the challenge is 'where' it is implemented. If implemented at MNO level, although this might be technically possible to seamlessly send traffic to a competitor, it still leaves MNOs with issues mentioned previously in relation to the financial model.



MNOs will struggle to implement eUICC and which we believe can only be implemented by an abstracted, agnostic IoT connectivity platform

We predict that in 2020 MNOs will struggle to implement eUICC and which we believe can only be implemented by an abstracted, agnostic IoT connectivity platform, which basically carries out the switching at a level above the MNOs – at a 'Super' MVNO level. We believe that profile management and the network switching algorithms must be driven by service provision to the device rather than the profitability of any one MNO and as such need to be implemented within the MVNO's platform solution. Only by doing this can a single pane of glass management capability, single global invoice and single support service be delivered for an Enterprise's total global estate of IoT devices.

8. The surge of Hypercloud

Years ago, when cloud first came on the scene many people thought that it wouldn't have an impact. The data centre was the core. People would always want boxes and kit on site, but what happened over a few years is that the IT infrastructure became the legacy. It was like grains of sand on the chess board, by the time you realise it is happening it's too late. What we see currently happening with the early moves from Hypercloud providers (AWS, Azure, Google) in the IoT space is exactly what happened to the onsite hardware business.



Nick Earle, CEO Eseye

“Amazon Web Services (AWS) has been in the IoT market now for over 12 years, but for the first seven not many people took them very seriously. This is because disruption is inherently invisible in the first few years. It's the same reason Kodak was toppled from the top of the camera market when digital cameras came in, because for the first few years its market share was very small. As soon as it becomes noticeable it is too late to stop it.”

Cloud had its challenges with security. As a CIO or CISO one of the biggest risks in IoT is the explosion at the edge of the network and the threat perimeter. Perhaps, another reason we haven't reached 41 billion devices. However, with Hypercloud deploying a security service that audits the configuration of devices, monitors connected devices and detects abnormal behaviour will mitigate these security risks. The challenge is being solved by putting security policy in the very centre, but with automatic deployment to the edge.



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said Alfonso Velosa, research vice president at Gartner



“Overall, end users will need to prepare to address an environment where the business units will increasingly buy IoT-enabled assets without policies for support, data ownership or integration into existing business applications,” said Alfonso Velosa, research vice president at Gartner. This will require the CIO’s team to start developing a policy and architecture-based approach to support business units’ objectives, while protecting the organization from data threats.” [Gartner](#)

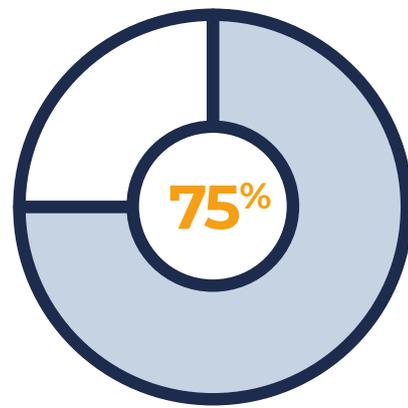
We predict that 2020 will see at least 40% of new large IoT projects deployed in a hyperscale cloud platform. The key drivers for these decisions will be cost, global scalability and the ability to adopt central policy management and deployment to the edge.



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9. Enterprises enter the game

Much of the 41 billion missing devices from earlier predictions are mainly due to large enterprises underestimating the complexities of IoT deployments. In fact, billions more devices could have been deployed but for the complications of the task. The intricacies involve creating specialist device hardware, establishing access to global connectivity and the ability to manage vast amounts of data effectively and efficiently. This was recognised by Gartner when they predicted in 2018 that “75% of IoT projects would take twice as long to deliver.”



75% of IoT projects would take twice as long to deliver



If you can simplify the device, simplify the connectivity and simplify getting data into the cloud for management and analysis, you will see a domino effect.”

says Eseye CEO Nick Earle

“Mass adoption of IoT will happen as it becomes easier to deploy and this is what we call the rule of three. If you can simplify the device, simplify the connectivity and simplify getting data into the cloud for management and analysis, you will see a domino effect as a steady stream of large enterprise carry out large scale global deployments,” says Eseye CEO Nick Earle.

Latest enterprise market predictions from Gartner Inc. forecasts that “the enterprise and automotive Internet of Things (IoT) market will grow to 5.8 billion endpoints in 2020, a 21% increase from 2019. By the end of 2019, 4.8 billion endpoints are expected to be in use, up 21.5% from 2018:”

Removing the complexities and barriers for large enterprises will see a greater uptake on a global scale. We predict that 2020 will be the year that enterprise global IoT roll outs will take off driven by simplification of device design and deployment, global connectivity and hyperscale cloud managed services.



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10. LPWA is equally important as 5G in IoT

Right now, there is a lot of hype around 5G on the TV, social media and at technology conferences – it’s everywhere, but also nowhere. Will it happen? Absolutely. Yet there isn’t the infrastructure for 5G or the use cases and it’s also going to be very expensive. Implementing this new infrastructure will be very Capex intensive for the MNOs and will be one of the key reasons why 5G will be limited to early proof of concepts in 2020.

The new opportunity that you don’t read about, because it doesn’t capture the public’s imagination, is LPWA (low-power wireless access) with implementations such as narrow band (NB-IoT). As the name suggests LPWA keeps the power usage low, allowing devices to be deployed for much longer periods, but also keeps costs down. LPWA can also penetrate walls and other barriers more easily.

Eseye founders delivered the world’s first ZigBee design and developed the first IEEE 802.15.4 radio. ZigBee, an inherent part our DNA, is the specification for a group of high-level communication protocols that enable the creation of personal area networks with small, low-power digital radios, such as for home automation, medical device data collection, and other low-power low-bandwidth needs. They have previously been used for design in small scale projects and solving connectivity problem. We predict that there will be a steady rise in LPWA adoption and that could become anywhere between 15 to 25 per cent of all IoT revenues in 2020.



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Summary

As technology rapidly evolves, we are becoming increasingly digitally connected. Although, some of our predictions may seem counterintuitive our 2020 predictions are founded on an in-depth experience, insight and understanding of the IoT market.

However, as more 'things' are created much more needs to change to enable these devices to simply work out of the box with ubiquitous connectivity. Simplifying device development, deployment, connectivity, analysis and management will rapidly increase the volume of 'things' that will continue deliver significant business outcomes and improve lives.

Eseye has been advising on and successfully delivering IoT projects for the past 13 years, covering more than 2,000 customers in over 190 countries. We have seen IoT achieve amazing results in many places and significantly change peoples' lives.

We believe that we are at the tipping point for the large scale take up of IoT and 2020 will see many more large-scale roll outs. It will also be a year of mass digital disruption as IoT reaches the inflection point that sees the extensive deployment of 'things' and the delivery of extensive global IoT projects.



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