

Why isn't IoT the ubiquitous technology we anticipated?

Important elements to consider when rolling out IoT and how you can accelerate the adoption of IoT within your organisation.

Introduction

Why isn't IoT the ubiquitous technology we once expected to see?

When the late 2000s gave rise to IoT, it came with the hope and promise of revolutionising industry by connecting literally everything to the internet, giving customers a personalised experience and giving businesses a deep understanding of their product usage and customer behaviour. However, fast forward ten years and we really haven't seen the progress we were promised and the uptake isn't as ubiquitous as we had originally anticipated. Wearables, specifically watches, have gained traction, Industry 4.0 is promising, but the other areas haven't kept pace.

Where is my smart fridge?

In a recent report by [IoT Magazine](#)¹, it was found that nearly 75% of IoT projects fail. Cisco's [Connected Futures report](#) agreed, with 76% of companies surveyed stating that they considered their IoT



investments failures. Despite this, especially given the road map of Industry 4.0 and regardless of the disruptive impacts of COVID-19², according to [Gartner](#)³, 47% of organizations plan to increase their investments in the Internet of Things (IoT).

As with all technologies there is a steep learning curve and despite the interest we have seen for IoT within industry, most projects aren't making it off the R&D bench. We often see companies engaging in proof of concepts or small-scale trial programs, however few of them manage to be promoted into production, and fewer still are seeing the return on investment anticipated.

IoT is on a curve of accessibility. As the manufacturing of sensors becomes more economic and with proliferation of LoRaWAN and Nb-IoT networks, the connectivity has become more trivial. IoT can, and should, be included in the strategies of small or medium businesses.

IoT projects fail to scale up to production for a myriad of reasons. In this paper we try to surface some of the most important elements to consider when rolling out IoT and how you can accelerate the adoption of IoT within your organisation.



Ian Cowley

Principal Consultant Data Engineer

Ian Cowley started his big-data journey over ten years ago. Having worked on a variety of projects from finance-data systems to massive-scale grid computing during the emergence of big data, Ian has become a thought leader on business transformation through data-driven decisions.

¹ P.V., Gengarajan. "Why do IoT projects fail? — What you must know and do." *The IoT Magazine*.

² Connected Futures Cisco Research. "IoT Value: Challenges, Breakthroughs, and Best Practices."

³ Goasduff, Laurence. "Gartner Survey Reveals 47% of Organizations Will Increase Investments in IoT Despite the Impact of COVID-19." *Gartner*.

1

Why IoT?

We're assuming that because you're reading this you already know the value IoT can bring to your business and why you would consider incorporating it as a technology. But before we get into our thoughts on the best ways to take advantage of this technology, let's briefly go over the value and offering of IoT.



Efficiency

Measuring processes whether through your supply chain, point of sale, services or machinery generates tremendous data and insight, which ultimately enables you to view your optimisation bottlenecks and increase efficiency.



Preventative maintenance

By measuring the performance of equipment throughout your business and applying machine learning and analytics, organisations can detect problems early, reducing the cost of repair and optimising scheduling and repair pipelines.



Safety

The utilisation of machine learning and sensor integration across your supply chain, manufacturing, tooling and devices means that IoT can enable organisations to build models for incident detection and prevention.



Customer experience

Through the integration of sensors into your products and services, it is possible to create focused, targeted customer experiences and drive engagement.



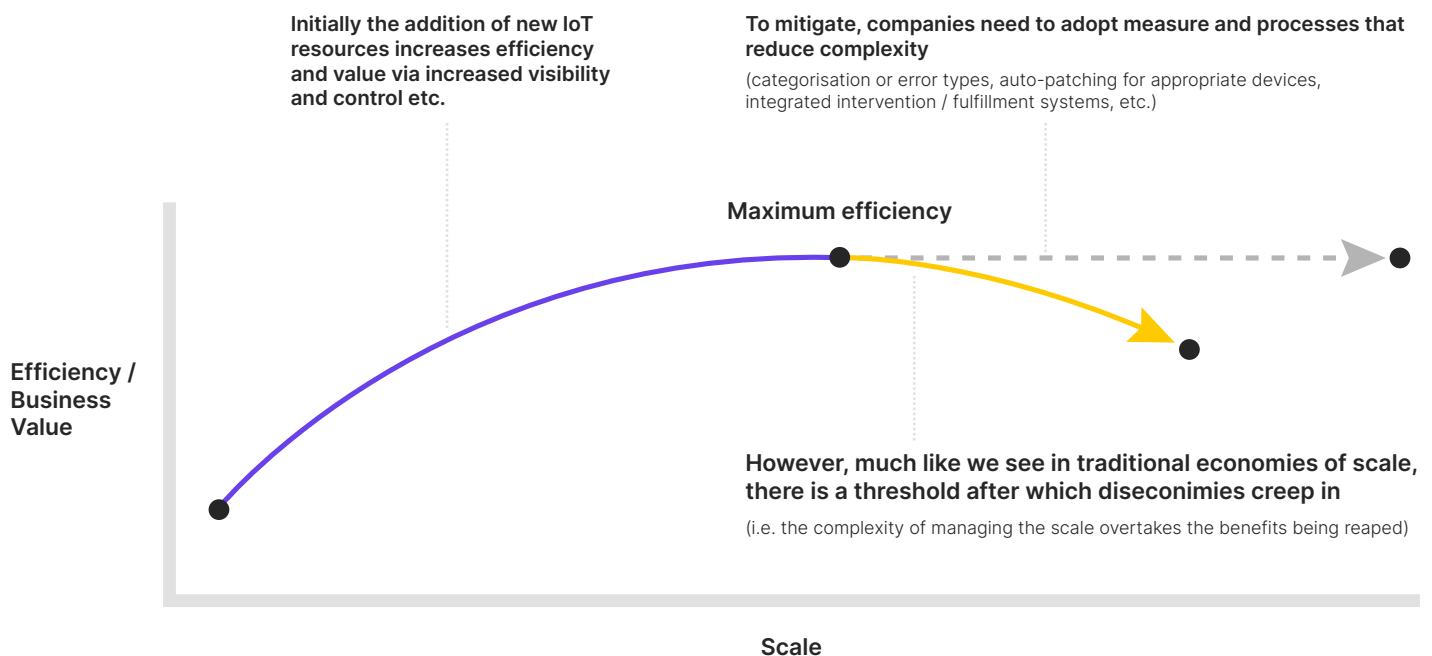
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Scale

Managing sensors in an IoT network at scale is non-trivial. IoT uses a deployed technology, not a website, so it's harder to fix mistakes and harder to detect when problems are occurring. In most scenarios IoT only becomes efficient at scale, however the scale of an IoT network increases any problems exponentially.

IoT efficiency at scale



Let's say you are a fire safety company, and you deploy a network of sensors to detect when fire extinguishers are used or tampered with. What happens when one of those sensors goes down, runs out of power or is used or even worse, you find there is a security flaw or bug in the sensor firmware?

The secret is asset management. Asset management enables organisations to manage their sensor domain at scale, and gives an aerial and detailed view what is happening to your devices. With asset management you can often automate actions when sensors are non-responsive or detect faults i.e. intermittent signal. Asset management tooling often gives clustered or temporal views of warnings and faults, enabling your business to respond appropriately and tune out false positives. Asset management often supports the roll out of configuration/patches/security updates routinely with little to no downtime and without site visits.

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Integration

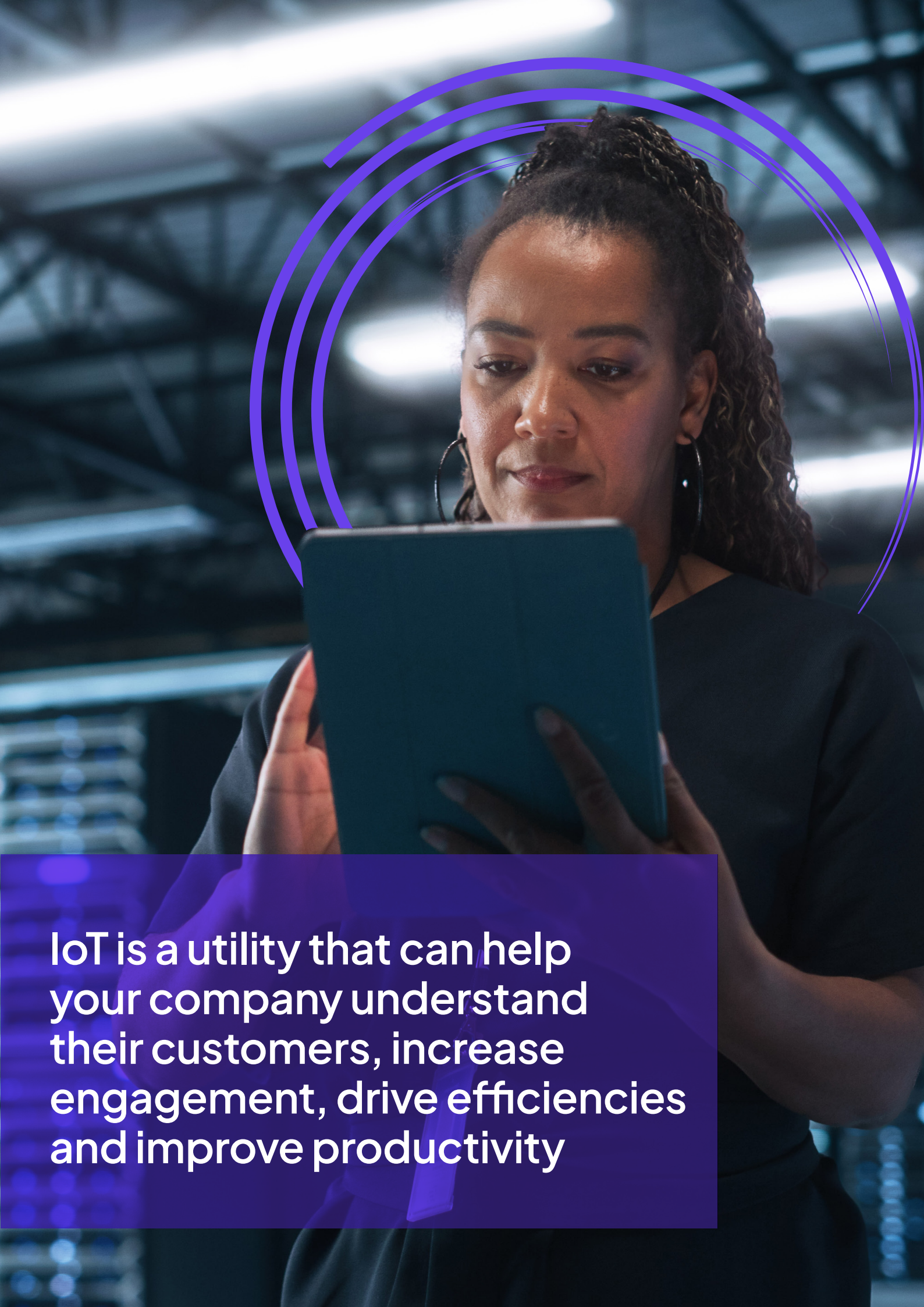
The next piece in the IoT puzzle is integration. Often we consult on projects where the IoT solution has a makeshift workflow or application built to respond to signals or events.

Take for instance an electronics company who rolls out IoT sensors in their washing machines to detect defects in an effort to reduce maintenance costs. The company builds a custom application which uses stream analytics or a workflow application to detect problems and subsequently raise an email or SMS message to the repairs department. However, because it isn't integrated into their CRM system or repairs and ticketing system, it involves a lot of manual management and context gathering. In this scenario, the repair department becomes immune to the noise and ignores the IoT signal, as they aren't able to cope with the influx of messages.

In successful IoT integrations the messaging infrastructure is built with integration as a first-class tenant and not as an afterthought. Where the stream of telemetrics, warnings and alerts are tunnelled through an enterprise service bus or integration pipelines, each area of the business has the ability to take advantage of the signal and to create actions and insights that truly benefit their customers and business. Once IoT is integrated into existing business operation systems (i.e. CRM and ERP) context can be added to the signal.



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IoT is a utility that can help your company understand their customers, increase engagement, drive efficiencies and improve productivity

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Business outcomes

The final observation we have made when consulting on IoT projects is the business value alignment. IoT is still a reasonably unseasoned technology and we often find that organisations have made instinct-based decisions over data or strategy driven ones.

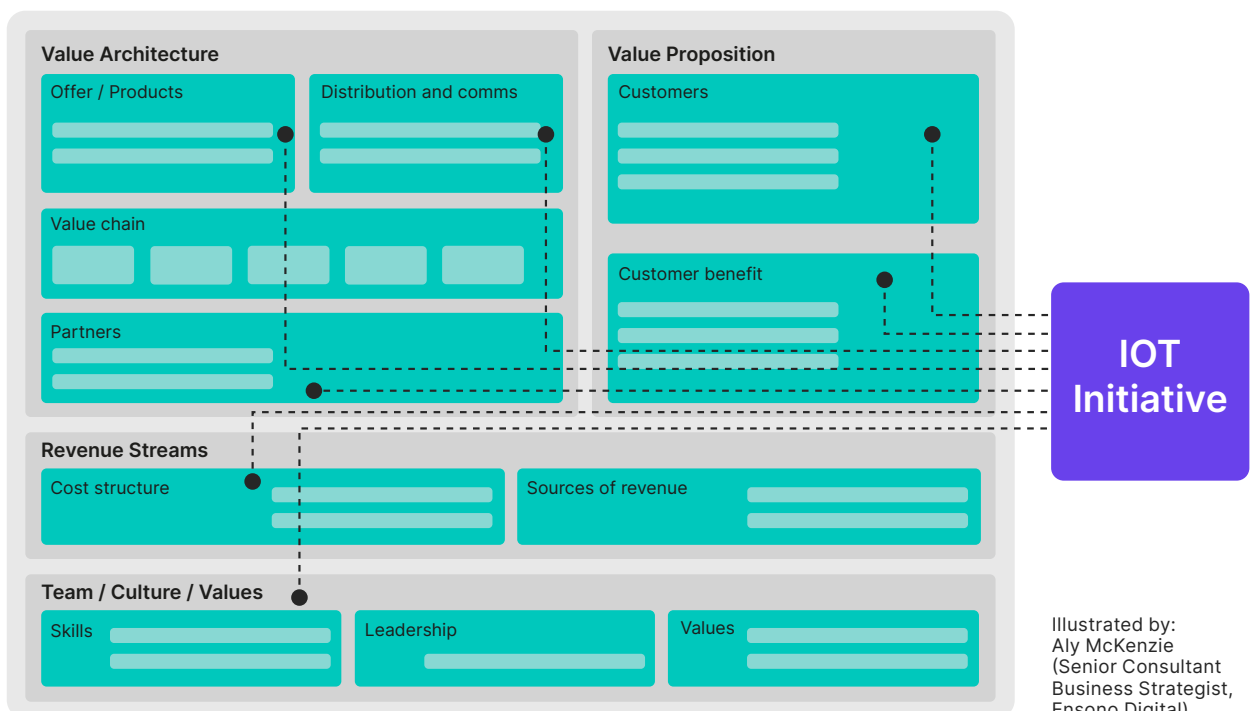
Over time we have observed this is true of new technologies in general. Businesses aren't sure how to get to grips with a new technology, so they have a stab at a scenario they believe will benefit the business and learn from the process, without alignment to the overall company strategy.

This approach can end with a technically successful IoT program, however upon reflection, it's not providing a huge amount of benefit to the business and ultimately the project gets canned. This approach isn't without merit, clearly the organisation is getting experience in the technology and learns from the process. Also, if the business has built the infrastructure and technical capabilities properly, it should expedite subsequent projects, but it's still a risk and can put the business off investing in the future.

As with all technology projects, a business outcome mapping exercise will help the project deliver value from the start.

Ultimately these exercises will still point to opportunities where IoT delivers value. Even if this process is done as a validation exercise, while this may ultimately suffer from solution bias, it still has inherent value.

Ensuring a good fit between business value and IoT initiative increases their chance of approval, implementation and adoption.



Illustrated by:
Aly McKenzie
(Senior Consultant
Business Strategist,
Ensono Digital)

Conclusion

IoT is a utility that can help your company understand their customers, increase engagement, drive efficiencies and improve productivity.

However, it is not a silver bullet. It requires alignment with your business strategy and integration into your business management systems. As a technology IoT is about scale and if you plan to incur a technology at scale then you need the right tooling, otherwise it can be almost impossible to differentiate the signal from the noise and to understand what is happening in your network.

A lot of businesses we have spoken to are very keen to harness the power of IoT. They can see the value of IoT as a technology and how it can help them drive process efficiencies, reduce costs and increase customer and process insight. However, their projects tend not to get past R&D and into production.



Businesses often start out by finding scenarios and gaps within their business that they would like to solve; For instance, ‘We would like to understand why we are seeing so much moisture damage in our properties’.

They deploy sensors, network infrastructure and some stand-alone workflows and application logic. However, they quickly discover it can be very difficult to separate the signal from the noise and that the overhead of the maintenance and support of the IoT infrastructure makes the capability unviable. Organisations often struggle to understand how to harness the information coming from the sensors or even the state of their sensor network, and they can struggle to keep up with the management of a complex network of devices.

There are a myriad of reasons IoT is difficult to get to grips with, which is a reflection on the technology’s maturity and the time it has taken for infrastructure and manufacturing to catch up. The primary reasons for businesses struggling with this technology are scale, integration and business focused outcomes. With the rise of commodity IoT technology available, especially with cloud hosting and support, there has never been a better time to take advantage of this amazing technology.

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Visit ensonodigital.com

hello@ensonodigital.com

+44 20 3176 4690