

# The Internet of Things: preparing for the revolution

## Why we need to talk about IoT

By Erica Constance, Cyber Portfolio Manager

*Only a few years ago, it was little more than a buzzword. A smart phrase to drop in to a presentation, but of little relevance to the daily management grind.*

*Now the Internet of Things (IoT) is a part of almost every modern business conversation. Research company Gartner estimates that 8.4 billion connected devices will be in use worldwide by the end of 2017<sup>1</sup>, up 31 per cent from 2016. It will reach 20.4 billion by 2020. Gartner also suggests that total spending on IoT products and services will reach almost \$2 trillion in 2017.*

Boardrooms and executives at all levels need to understand this bright new technology. This article explores the opportunities IoT creates, but also the risks it brings and ways to manage the risks to make sure everyone benefits from IoT.

### IoT is good for the consumer

IoT is already transforming households and our everyday lives. The expression “at the press of a button” once epitomised the convenience of modern electronics. Now even that sounds dated as Siri, Google Assistant, Alexa and Cortana vie for attention – ranks of electronic adjutants ready and willing to do our every bidding.

We’re reaching a point where consumers almost expect familiar objects to have the ability to think autonomously. Internet connections are being built into everything from cars to healthcare devices, air-conditioning units and light bulbs. It’s convenient, even friendly, and appears to have little downside.

Car manufacturers such as Porsche and Tesla already offer software updates “over the air” – overhauling your car’s systems while on the drive or in a car park in the same way you’d run a smartphone software upgrade. The car is a computer.

In the travel industry, hotels have started to offer apps allowing guests to control the room’s thermostat or TV settings. Keyless entry (using your smartphone

instead of a room key) is being piloted by major hotel chains. Visitors to Walt Disney World have access to a MagicBand, an all-in-one device that allows the user to touch a sensor to unlock hotel rooms, enter theme and water parks and charge food and merchandise purchases.

Elsewhere, health apps such as Fitbit, for example, measure things such as sleep quality, steps taken, heart rate and other fitness metrics. They can already, with some accuracy, predict when we might need to seek medical assistance, allowing us an unprecedented degree of autonomy over our wellbeing.

As well as health, IoT is already playing a key role in safety. Services such as Ring, which allows you to answer your door using your smartphone, and Nest Cam, a 24/7 live streaming camera, allow us to monitor our homes even when we’re not there.

The Internet of Things is an enabler for the elderly and less mobile. Apps using motion sensors, microphones, paging services and streaming data can help some of the most vulnerable in our society. The UN estimates that in developed countries the proportion of people aged 60 and over will rise to become a third of the total in 2050<sup>2</sup>, so the IoT will make a real difference to our day-to-day lives.

Location tracking is also proving a boon. Mapping software, GPS and Bluetooth technologies mean the days of losing your wallet down the back of the sofa are dwindling.

For the consumer, this might eventually mean getting in the car in the morning, secure in the knowledge that it has updated itself overnight. Your route will be optimised according to weather and traffic conditions, and a parking space will be found for you on arrival.

It might have already told you that the oil will need changing in a few days’ time and even schedule an appointment with a mechanic based on what it knows about your availability. Your wallet will be where you left it and if it isn’t you’ll know why.

<sup>1</sup> [www.gartner.com/newsroom/id/3598917](http://www.gartner.com/newsroom/id/3598917)

<sup>2</sup> [www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015\\_Report.pdf](http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf)

You'll be able to arrive at work to find your usual breakfast waiting for you and the coffee machine will remember how much milk you like in your drink based on previous orders. You'll pay for it without noticing or having to put a hand in your pocket, and your lunchtime online shopping order will have been all but chosen for you based on your habits and the information fed to a dedicated app by your fridge.

This might be a rose-tinted vision of life in an IoT world, but it's not so far-fetched as we might once have thought. It's here, it's connected and it looks good – as long as it is safe and secure.

### **IoT is good for business**

The Internet of Things promises a benign new world of ease for the consumer, but it is in business that it will have the greatest impact. Again, the outlook is promising, but not without risk.

Businesses look set to employ 3.1 billion connected items in 2017, according to Gartner. IoT opens up worlds of data to improve efficiency, provide smarter ways of working and make us more productive. We can now improve our products and make better commercial decisions faster than ever before.

The interconnection of devices has created a wealth of new data sources. Companies are now able to observe consumer choices much more effectively and better test different ways of attracting and retaining customers. Today there are more ways than ever to influence consumer behaviour. Privacy, of course, is a concern.

Such developments are not restricted to tech-based firms. Smart electric meters and commercial security cameras are already prevalent. Gartner suggests that from 2018 onwards, smart building devices – such as LED lighting, heating, ventilation, air-conditioning and physical security systems – will take over as connectivity is channelled into higher-volume, over-cost devices.

In 2020, it says, such cross-industry devices will number some 4.4 billion units. Studies by the Centre for Economics and Business Research suggest that Big Data analytics and the IoT are expected to add around £322 billion to the UK economy between 2015 and 2020 <sup>3</sup>.

Companies are increasingly able to fine tune their operations, with usage-optimised energy provision and more efficient energy-reporting systems. Though fleet managers have been using telematics for some time, it's ever easier to keep tabs on things like peak traffic flows by means of smartphone apps. This has levelled the playing field for smaller players.

IoT is allowing businesses to optimise their staffing, too. By tracking downtime or inefficient working, they can make better decisions about when to hire extra staff, how to plan for holidays and when extra space is needed.

Smart devices also help monitor consumer behaviour, making smart product recommendations and optimising searches. The proliferation of data available should result in more efficient, cost-effective and relevant advertising, with businesses able to get to know their demographics better and extract information from every stage of the purchase cycle, including research and review.

It's all very well sitting back and letting the predictions and opportunities wash over you, however. What we are seeing is but the beginning. Adrian McEwen from MCQN, a UK product agency working with connected devices and the IoT, sums it up nicely. "Lots of the initial talk around the Internet of Things focused on how sensors can drive greater efficiencies," he says. "However, this is like saying the web is good for distributing PDFs of paper catalogues."

There's more to come. The real impact of IoT will arise from the new ways of designing services and the enhanced understanding that this tech opens up. Businesses that get their hands dirty and start to experiment with what's possible are the ones that will gain the knowledge to unlock the potential.

And the potential is immense. IoT makes it possible to monitor and optimise resources. That could mean smart bins that can report back to the waste company when they need emptying. Or software and online systems to integrate better with the physical world to ease employees' working practices – by showing in real time the availability of desk space, for instance.

In short, the IoT promises business the sunlit uplands of efficiency, insight and control. But like all digital nirvanas, there will be downsides.

<sup>3</sup> [www.sas.com/en\\_gb/offers/16q1/cebr-big-data-internet-of-things.html](http://www.sas.com/en_gb/offers/16q1/cebr-big-data-internet-of-things.html)

## IoT is good for business

As one of the world's top 20 general insurance and reinsurance companies, QBE believes IoT will continue to have a huge impact on the insurance industry.

Advances in safety technology will affect things such as accident frequency, which could result in fewer losses and reduced premiums. For some time, insurance providers have been fitting devices into cars to measure driver safety and adjust premiums accordingly.

In the drones used to assess crops, the sector already has an example of the technology in use. Using near infrared imaging and normalised difference vegetation index sensing, which identifies living plants, farmers are able to isolate problems with their crops and make adjustments before ever needing to make a claim. IoT technologies can also evaluate weather and assess damage from natural disasters.

Connected wearables give the consumer greater control over their own health and wellbeing. Approaches like these are encouraging users to change their behaviour and, by extension, their exposure to risk.

However, a connected consumer lifestyle could also result in new types of risk – digital and data-related. We could eventually see a move in the insurance industry away from policies that insure products towards people-based cover. Rather than taking in information about how long a driver has been on the road, insurers would place greater emphasis on factors such as the places you tend to drive and the risk associated with them.

## Being aware of the risks

Every new technology brings new crime, new dangers. With everything connected and more digital windows to break open, hacking becomes easier. And with this increased capability comes the need for enhanced security and monitoring.

Law-makers are moving fast. The new General Data Protection Regulation, which comes into force in May next year, places specific obligations on data processors and imposes hefty fines on anyone playing fast and loose with an individual's data.

Privacy and cyber-fraud are one thing. This is bigger. Many IoT devices are connected to or control physical objects – from nuclear plants to insulin pumps – so the threat is no longer just a data-related one. A security breach might entail rather more than a financial loss. Recent big malware attacks have played havoc with Britain's health service, but they have yet to take direct control of machinery.

So embedding security from the start is crucial. Secure network authentication, locally processed and encrypted data and barriers within networks will be key to minimising these risks. Staff at all levels of an organisation need to be trained and vigilant.

Another risk to business is the level of support a firm is obliged to provide for an IoT product once purchased and the liability that brings. Depending on the class of product, extended support may be required. For example, if a manufacturer builds an internet-enabled self-driving car which later reveals a critical bug, it will need to figure out how to deploy the improved software – perhaps globally.

The lifetime of a car is significantly longer than that of a toaster and the consequences of a problem life-threatening. Standard end-user license agreements might not be suitable and there could be legislative restrictions based on a product's intended use.

The scope of IoT can only grow. The opportunity it presents is enormous for business and society – one that is too great to miss out on. However, stringent security measures should be put in place to safeguard customers and protect companies.

We are seeing the benefits of the Internet of Things in almost every aspect of our lives. IoT is here and it promises a prosperous and serene future – one of greater efficiency, greater control, improved health and safety.

We cannot, however, step blindly into this new world. Businesses, politicians and regulators all have a part to play in safeguarding these new opportunities so they benefit everyone. We need to talk.

Erica Constance contributed to Chatham House's 4th issue of The Journal of Cyber Policy, which was focussed on IoT.