

THE ART OF CONNECTING MAN AND MACHINE

THE INTERNET OF THINGS



What does 'innovation and connectivity' actually mean? What is happening behind the scenes?

When we think of the word 'innovation' and where it is happening in technology right now, we can't look too far beyond the Internet of Things (IoT). According to the ever-reliable Wikipedia, IoT is 'used to denote advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications'. Simply put, IoT is a well-connected infrastructure where nearly every type of machine / device has basic inbuilt intelligence, which is used to transfer data and interact with other machines / devices; and through these devices with people.

IoT has often been referred to as the industrial Internet and aptly so, as it has the potential to herald a transformation in business and society akin to the First Industrial Revolution. According to Gartner, there will be 26 billion devices on IoT by 2020, while ABI research says the number of devices wirelessly connected to it will be close to 30 billion in the same timescale. Given that the world population is currently seven billion and is expected to be around 7.7 billion by 2020 – that is an astonishing number of devices talking to each other and to us.

Numbers are one thing. But what does this innovation and connectivity actually mean?



In the near future, we could be living in a world where temperature in buildings will adjust in line with weather conditions. Fridges could restock themselves based on the dietary regime set by doctors, cars could book in for a service and order the parts they need. These new networked devices will be able to publish data about their status to the Internet and this information could be used in various ways to improve the products and services we consume on a daily basis.

In the near future, we could be living in a world where the temperature in buildings will adjust to weather conditions outside. Fridges could restock themselves based on the dietary regime set by doctors and cars could book in for a service and order the parts they need. These new networked devices would be able to publish data on the Internet and this information could be used in various ways to improve products and services we consume on a daily basis. It will form the basis of smart grids and smart cities, improving energy consumption and usage, traffic flows, and citizen-based services.

Indeed, the IoT could help solve multiple problems in two major domains: Energy and Healthcare. Buildings waste more energy than they use effectively. With IoT we will be able to cut this waste down to almost nothing. Healthcare is currently delivered in lumps: Most of us visit the doctor a couple of times a year, and get our blood pressure checked every now and then. IoT will allow us to monitor bodily functions at all times. A couple of sensors discreetly attached to the body will keep us constantly informed about our vital functions.

IoT is also likely to have a major impact on the logistics industry and supply chain as objects become aware of their environment and can be rerouted more easily in case of disruption. Greater use of sensing technologies and connected devices will be in asset management – the BT LDAT multi-sensor platform, something that Gartner refers to as Operational Technology (OT), is likely to expand the remit of CIOs from IT to broader asset management.

The potential is astonishing. But as with any huge technological change, there is a lot of hard work to be done behind the scenes to make these transformations to everyday life a reality. And this is where companies like BT are working tirelessly to ensure that the underlying infrastructure and connections are

capable of sustaining the IoT.

At BT, we are making sure the underlying infrastructure is reliable and that we are able to sustain this huge expansion of the Internet and the demands, both as wired and wireless connections. The more interconnected the world becomes, the more dependent we are on networks. We also need to work on ensuring that the right regulations are in place and that we are abiding by them at all times. And finally, there are privacy and security issues at all levels. The technology will allow companies and governments to collect unprecedented amounts of data and everyone involved will have to be vigilant and adaptable to make sure the data remains safe.

For us, IoT is all about the art of connecting in action. This art of connecting is our vision for networking that is not just about technology; but also about imagination, know-how, and insight. It's as much an art as a science, and the recognition of the need to balance technology and creativity. CIOs have become creators who bring their vision for the networked world to life.

Whether it is about delivering great network performance, realizing possibilities in the cloud, or working anywhere in harmony, deploying latest mobility and collaboration solutions, the art of connecting is about the unparalleled experience and insight BT brings to a connected world.

Innovation is 1 percent inspiration and 99 percent perspiration – or so says a popular adage. In the context of IoT, we could say 99 percent is about machines and the connecting infrastructure that supports them. But having things connected would mean nothing without the intelligence to make those connections matter, to transform the world around us, and make it a better place to live and work. And it is that 1 percent of 'art,' which will help develop the Internet of things into the Internet of something.

The connected car: Making sure you have an e-seatbelt

One fascinating aspect of IoT is that the

cars we drive are rapidly becoming 'smart-phones on wheels.' Most new models now have a tablet (or tablet-like) device attached to the dashboard to allow you to run a range of apps, download content, find a parking



space, or even join an eco-driving game. If you misplace your keys, you can use an app on your phone to unlock the car and drive it away. What could be more convenient? New cars will soon have at least one embedded SIM card and multiple WiFi hot spots, so they are the ultimate connected device.

The problem is that cars were never designed to be connected. A connected car has multiple infection points. Many smartphones contain malware – so what happens if you sync it with your car, or you plug in a USB device, which you thought only had music files? Or somebody takes over the WiFi used by your tyre pressure sensors, or you get an over-the-air software fix that has somehow been compromised?

So what is BT doing about all this? Well, we are following the hackers' trail. We are using the tools and skills, from the traditional IT world, and engaging them in the brave new world of IoT to defeat the hackers. We are working on an ethical hacking module for car manufacturers, so they can better understand their vulnerabilities. Building on this is a managed service to protect cars as they do not have the resources to protect themselves. If you have a tablet, you will replace it every few years with a more advanced and more secure version, but a car has a lifetime of over 10 years, with fixed computing resources. Finally, we are also working on a secure gateway in the car network that will manage security updates and watch out for those files that shouldn't be there.

Author



Ashish Gupta

President – Portfolio and Service Design, BT Advise,
BT Global Services

Ashish Gupta is responsible for implementing network and IT strategy globally. As head of BT Advise, he also leads the development of BT's global professional services capabilities that complement core propositions. With extensive experience across BT, Ashish has held several positions including being the managing director of BT Global Platforms and deputy CIO of BT Wholesale. Before joining BT in 2004, Ashish spent nine years with Tech Mahindra in various roles, including IT Delivery Director, responsible for Tech Mahindra's CRM practice. He holds a Master of Business Administration Degree from the London Business School.

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