

Data, bots & chips: a menu for the IoT version 2.0?

According to Gartner's top strategic predictions for 2017, by 2022, the Internet of Things (IoT) will save consumers and businesses \$1 trillion a year in maintenance, servicing and consumables.

That's because IoT will enable far smarter maintenance and service schedules for physical objects by effectively creating digital versions which can be inspected instead. Large pumps, airframes and turbines in difficult to reach locations could be networked and will become much easier to maintain – perhaps with condition monitoring carried out remotely without the need of an on-site engineer.

There can be no doubt that connecting physical objects to digital systems through IoT is a rapidly growing trend. In the newly connected world, production-line equipment, plant components and capital assets can all be monitored in real-time, whilst in use, providing deeper insights to help improve efficiency, availability and throughput.

We're not just seeing connected physical objects, but also a move to connected services like smart metering. Autonomous vehicles are appearing and location tracking technologies have a critical role to play for our emergency services. What is still required though to ensure real value from such connectivity in order to reach exponential growth in this space?

→ Demand for developer expertise

The use of algorithms has always been inherent in product development. It is the bread and butter of



many sensing systems for military, aerospace, automotive, medical and consumer industries. In fact algorithms have been around for ever.

The Babylonians developed a factorization algorithm for finding square roots around 1600 BC.

However, when the use of algorithms is considered against a backdrop of cloud computing and how easy it has become to transfer data from a device to the data centre then large companies are looking to use the new emerging connected world to improve performance, enhance productivity and increase profit. The use of algorithms is no longer confined to low-level mathematics, electronics or communications – the arena is open and innovation rife. Expect large corporate companies to employ teams of data scientists, mathematicians, as well as software developers, in order to maximise the benefit algorithms can offer.

→ The need for a common language

Domestic interaction with Bots (an application that performs an automated task) is established and set to grow. For example the recent announcement from Amazon that the Echo personal assistant will be available outside of the US, in the UK and Germany, will boost its reach.

Although you can connect Bots to pieces of kitchen and home equipment the process still requires significant user interaction to carry out the setup. For example you can connect a wi-fi enabled kettle or your fridge to the Echo – with some effort. To augment the effectiveness of these personal assistants other devices in the home require straightforward connectivity. Ask Alexa “Can you make me a cup of coffee?”, she will reply with something along the lines of “I wish I could. Cooking is beyond me at the moment” – perhaps a hint that Alexa will soon be making your morning coffee?

In order to provide the user with a rich, robust and zero config ecosystem of devices some standardisation of protocols may be required – who is going to do this and who will get their standard to the forefront is unclear, but expect to see further convergence over the next few years before an exponential uptake of connected devices is achieved.

↳ Ubiquitous, low-power, low -cost connectivity

Further advances in chipset and micro-processing technologies are required in order to provide low-power, low-cost, communication-anywhere, devices. Many current IoT applications use the smartphone as an intermediary - requiring additional user interaction. To enable transparent, ubiquitous connectivity, then

low-cost, low-power connectivity devices that work anywhere are required. Watch out for new chipsets which will extend the capability of 4G cellular networks beyond the smartphone and into IoT devices.