10 points ...

on the Internet of Things ("IoT")

This KWM BriefSheet sets out 10 points on the IoT and how it will transform industry, our daily lives and the global economy

- **The Internet of Things ("IoT") merges the physical and the digital worlds ...** The IoT translates physical actions into digital reactions, and vice versa, by linking sensors on physical objects, via a communications network, to some centralised or distributed computing power. The classic example is the internet-connected fridge that automatically orders milk from your grocery store when you are running low.

- **... leveraging "big data" analytics to produce useful information ...** Big data techniques reveal hidden insights, trends and correlations within data sets to generate valuable information. The IoT and big data sit side-by-side on the economic food chain: IoT's natural by-product is data, the fuel that fires big data.

- **... and automating physical actions that ordinarily would require manual intervention by a human operator.** The IoT is not limited to passive data collection. IoT applications may use actuators to automate a range of physical actions. For example, farmers may use the IoT to automate control of irrigation systems, based on moisture level data collected from sensors placed out in the field, or to remotely open and close gates that manage the flow of livestock around a property. At home, IoT applications can be used to manage heating, cooling and other household appliances to produce optimum conditions throughout the day, or to switch on the heating when you begin your commute back from work so that the house is warm when you walk through the door. The IoT will also play a significant role in the development of more complex automation, including self-driving vehicles.

- **The IoT is growing quickly ...** Intel has predicted there will be 200 billion internet-connected devices by 2020 — roughly 26 devices per human being, and a vast increase from 2 billion in 2006 and 15 billion in 2015. McKinsey has forecast IoT's global economic impact will be up to US$11.1 trillion a year by 2025.

- **... and promises to have a great impact across a wide range of industry sectors.** While many people think first of IoT's consumer applications, such as home automation systems and fitness band trackers, it is likely that its commercial applications will have a bigger impact on our economy. McKinsey has predicted that up to 70% of the potential value enabled by the IoT will be in business-to-business (B2B) rather than business-to-consumer (B2C) transactions. The Communications Alliance has identified transport and logistics, mining and resources, and agribusiness as three industry sectors in Australia that may generate the most value from the IoT.

This is an edited extract of "The Rise of the Machines: A Guide to the IoT". For a copy of the full publication, please contact Michael Swinson.

- **... but the IoT is not without its challenges, notably cybersecurity ...** The IoT is effectively a network of devices, and any network is only as secure as its weakest link. Unfortunately, given the relatively low level of sophistication of many of the sensors and other in-field devices, there may be many weak links in the IoT. An HP study in 2014 found that 70% of common IoT devices had some sort of significant security vulnerability. Companies using the IoT will need to take care to protect against security threats, including data theft, fraud and industrial sabotage.

- **... privacy ...** As interaction with connected devices becomes the norm rather than the exception, there will be few private actions that are not observed, recorded or tracked in some way. Companies using the IoT to engage with individual end users will need to think creatively about how to manage the associated privacy issues, to ensure that end users are aware of, and able to exercise an appropriate degree of control over, the collection and use of their personal information.

- **... and the allocation of liability for automated devices.** As more and more actions are automated, responsibility when things go wrong will become an increasingly complex matter. For example, it may not be at all straightforward to allocate liability for an accident involving fully-automated or partly-automated vehicles. The efficient allocation of risk is not only an issue for end users, it also a major challenge for law makers and the insurance industry as well.

- **Regulators will also have a significant influence on the development of the IoT ...** While regulators may not intervene directly in the development of IoT technologies, they will certainly influence the operation and management of the communications networks that underpin the IoT. From ensuring there is sufficient spectrum available to carry IoT traffic, and that network operators do not unfairly prioritise or deprioritise different streams of that traffic, to creating and enforcing communications standards so that IoT devices from different manufacturers can operate together, regulators will need to find the right policy settings to enable the IoT to flourish.

- **... and government support will also play a crucial role.** Several economies in our region have identified the IoT as an important macro-economic trend and are investing heavily in promoting their IoT capabilities. China's latest Five Year Plan stresses the need to make the internet and related industries a new source of economic growth to extend China's economy beyond its traditional manufacturing base. Singapore also has ambitions of being the world's first "Smart Nation" and is investing in national infrastructure that relies on IoT technologies.

We are here to help you

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