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How to turn the meter reading problem into a world leading opportunity

Smart metering can be the heart of digital Britain – if industry, commerce and government work together

by Graeme Wright, Fujitsu

> What if we could create an entirely new internet that reached every household, was completely secure, and didn't need a single new hole to be dug? Imagine also that this network installs, manages and configures itself. Every home in the UK becomes a smart home, opening up possibilities for new services in health, personal care, energy management – and types of services we can't imagine today.

A truly smart approach to smart metering will foster a human centric intelligent society where everyone benefits

This is the real promise of smart metering. Done right, the roll out of smart meters to Britain's homes can build a digital Britain – house by house, at low cost, with no disruption or environmental impact. Smart homes, smart cities – a smart UK, ready for new services that will drive competitiveness, wealth and inclusion.

Smart technology

The technical key is a communications hub for smart meters that talk to each other as well as relay data to multiple devices. Using a network built of multiple technologies to deliver an optimal solution of cellular and Mesh communication infrastructure, each installed meter becomes an active node in a growing network. Meters look for each other and establish connections. Some meters configure themselves as wireless gateways that anchor them to existing network infrastructure. In this way, the new network grows naturally and efficiently, organising itself to meet traffic needs. It can also reconfigure itself, morphing in line with changing patterns of usage.

Fujitsu is building such a network in Japan, working towards a total deployment of 10 million smart meters in a self-forming, self-healing, self-optimising system. We're involved with pilot projects in places as far afield as China and New Mexico. The components used in these applications differ, but they all use tried and tested technology.

The technology exists and the promise is alluring. But getting from vision to reality isn't so easy.

The network sweet spot

The EU has mandated smart metering as part of the drive to reduce carbon emissions. The vision proposed by DECC with core, elective and value added services hints at the future if the right network can be found at the right price. Smart meters give consumers real-time information about their energy usage and costs, enabling them to manage their consumption differently and take advantage of alternative tariffs. But this mandate alone isn't enough to ensure the UK gets the smart metering capability it needs to compete in a digital world. Industry could provide a minimal smart meter solution that would meet the EU's aims but which didn't provide any other innovative services. That would be a costly mistake.

The simplest approaches to smart metering use long wave radio communications to provide low bandwidth with good coverage, but these require central planning for rollout and large scale upfront investment. Alternative approaches using existing mobile phone networks provide much better bandwidth, but less extensive coverage, and have particular problems providing in-building connectivity. Mesh networks, whilst offering resilience and coverage, are also not perfect; they too usually need complex planning and investment for the deployment of gateways. The Cellular-Mesh approach hits the sweet spot, combining low-cost radio-based terminals that can call out to a mobile network where the signal is strongest.

This is an excellent technical answer – but it begs the commercial question. Consumers – citizens – are not clamouring for the smart home. There's virtually no mainstream appreciation of the kind of services such a network would enable.

Smart apps

We can't itemise what the new generation of smart services will look like. But we can paint the background and invite others to populate it.

Examples are the way to get people thinking. Through our work on human-centric computing, Fujitsu has led many such visioning projects. So, for example, imagine an app that monitors a motion sensor, alerting a care service provider when the owner doesn't rise from bed in the morning.

Or the smart tablet that has an enzyme-activated, and enzyme-powered, short range transmitter that can notify another device when it has been swallowed, enabling the monitoring of treatment plans and avoiding overdoses. Or think of a person with diabetes, recording their blood sugar levels with a simple pen device that automatically transmits the data to their doctor's service. Given that 10%, and rising, of the NHS budget goes towards managing diabetes, small savings made here quickly add up to substantial benefits. All of these capabilities actually exist today.

It would be a costly mistake to provide a minimal approach solution that just meets the EU's aims

Electronic sensors of all kinds are becoming steadily cheaper and more powerful. Built into mobile phones and other devices, they form a new means of intervention and enhancement for service providers. The applications really are limitless. The only way to discover the "killer apps" of our digital future is to create an environment in which they can bloom – and that means a kind of app store for the smart world.

The marketplace

Apple's App Store set the mobile data market alight. Before then, mobile applications were plentifully available, but they were difficult to find, install and use. Developers didn't have a coherent mass market and couldn't be sure of getting paid. Apple changed all that by integrating the store with its devices and operating systems, by creating a platform rather than a solution, and above all by regulating the quality of apps accepted into the store. Users know that apps they download will work properly and won't compromise security.

We need a similar approach to the service base for smart Britain. We need a neutral, active standards body to provide a marketplace for smart apps. This body will make approved apps available in the most easily accessible way while protecting the integrity, security and quality of the network. In this way, no one will be able to hijack the new infrastructure for dangerous or inappropriate ends, while developers and consumers will be able to find each other with ease.

Benefits for all

Everyone involved in smart metering holds a piece of the puzzle. They don't always realise they're engaged on building the same picture. Yet, in the scenario painted here, the different needs of stakeholders are all compatible. Take, for example, those who manage our scarce energy resources. The smart network must enable them to control the energy system at building level, offering incentives for householders to change their usage habits around peak times. The same bi-directional data communications could serve the local council delivering public services or enable access to the universal credit system for benefits. All of these parties have very different motivations and goals, yet their needs coalesce around availability, bandwidth, reliability, flexibility, reach and cost.

A truly smart approach to smart metering, together with a trusted app store-style marketplace for services, will foster a human centric intelligent society where everyone benefits – individuals as well as corporates, rural and urban, young and old. It's a big vision that can be built from small pieces. It's not only the greatest infrastructure project UK plc can undertake, it's the first such project that can be delivered piece by piece at a human scale.

Best of all, it's self-funding. The scope for smart services is great while upfront investments in service development are low. This means entrepreneurs and public providers alike will be able to create scalable business cases with low risk. Business cases for cost-intensive home-delivered services almost write themselves. More sophisticated smart apps, such as those in the insurance arena, can be piloted and scaled on success, much as "black box" car insurance is evolving.

We don't know what the hit apps of the smart home, or the smart city, or the smart nation, will be. They may be so ubiquitous and unobtrusive that they're quickly taken for granted. Or they may change our lives so profoundly that their names enter the language. One thing is for certain: if we work together to align the forces at play, we can create the right environment for an advanced, inclusive digital Britain to blossom.

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