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Creating connections

IoT foundations for smart cities

EVERY THING IoT

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Here we explore the key insights from the Everything IoT Smart City Forum, where presenters looked at how technology and society can intersect in the years ahead.

In May 2016, Everything IoT hosted a Smart Cities forum at BlueChilli, Sydney, to discuss the frameworks, opportunities and risks that need to be addressed today if we are to reap technology's benefits in the future.

The event was moderated by Eitan Bienstock, Founder of Everything IoT and Managing Partner, Propeller Venture Capital. In this report, we highlight the major issues raised by the expert panel, including the interplay of government and private enterprise in the successful implementation of new technology.

From left to right:

Eitan Bienstock, Founder of Everything IoT and Managing Partner, Propeller Venture Capital

Peter Runcie, Leader of Future Cities, Transport and Infrastructure, data 61

Jonathon Gregory, Executive Director of Business Operations, The Department of Primary Industries, NSW

Catherine Caruana-McManus, Founder of Giant Ideas

Piers Hogarth-Scott, Director, Digital Consulting at KPMG Australia

Kevin Bloch, Chief Technology Officer, CISCO (ANZ)

Creating better economic and social outcomes

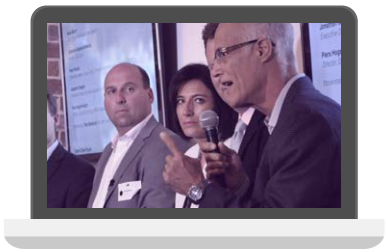
There is potential for cities to become dramatically more liveable, workable and sustainable by 2040. Within 25 years, road systems without traffic lights are highly probable and the Internet of Things (IoT) will have led to better garbage collection as well as more closely monitored and improved food and water supplies, and better air quality. KPMG director of digital consulting Piers Hogarth-Scott says, "The vast majority of Australians live in urban environments. So grasping these opportunities represents a wonderful opportunity to secure our prosperity and growth."

For Jonathon Gregory, Executive Director of Business Operations, NSW Department of Primary Industries, being able to see landscapes in four dimensions is key to achieving these goals. "We'll be able to virtually walk through time and space and better understand how things integrate – transport, food, air, water and land use."

Gregory's vision isn't based on fantasy. With over 900 scientists at work, Primary Industries is the most science-led department in NSW. Its remit covers a number of sectors heavily involved in 'Smart City' projects, including food and fibre production, bio-security, food safety, and water and land management. Working with internal incubators and researchers, stakeholders in industry and the community, as well as partners in universities, other government agencies such as Data 61, and corporations such as CISCO, the Department is already applying IoT to crucial areas including livestock, fish, sharks, wheat, water, soil, weather and many others.

While proud of the role science plays in the Department, Gregory points out that their driver is definitely economic. "That doesn't mean we're environmentally disruptive, but our aim is to make sure NSW and its resources are managed to create a better economy. That includes being more sustainable. IoT is in every part of this process, from the food we're growing and eating to the labelling of it," he explains.

Laying the foundations



Kevin Bloch, Chief Technology Officer of CISCO (ANZ), says we need to instrument, measure and collect data from everything.

CISCO has been propelling the global evolution of smart cities and campuses for almost a decade. When it comes to what Australia needs to be putting in place for the future, Kevin Bloch, Chief Technology Officer of CISCO (ANZ), sums it up in one word – instrumentation. "We need to instrument, measure and collect data from everything. That's what enables computers to perform their algorithms correctly," he says. "Comprehensive instrumentation and connectivity will give us better visibility to what's happening in our physical environments. This will help us make better, faster decisions, automate processes and enable prediction of future events".

Evolving technologies present challenges

Identifying the biggest obstacles to smart city implementation is also crucial. The ability to have diverse systems participate in a whole of city data platform is high on the list for Peter Runcie, Leader of Future Cities, Transport and Infrastructure at CSIRO's Data61. "IoT is an eco-system," he says. "There is no single player that has all the answers and it's really important that all of these technologies are able to work together and inter-operate." Smart cities in Europe are concerned about vendor lock in. Runcie believes that developing data architectures that cater for changing and evolving systems within smart cities helps future proof early investments.

While governments need to realise they cannot have an ideas monopoly on how a city will evolve, they do need to implement a digital platform for organisations to operate their innovations on. "If you build a platform and create an environment where businesses and universities can innovate, that's when we're going to start humming," notes Kevin Bloch.

All this means is working out what a city platform needs to look like. University campuses are great microcosms for experimenting with platforms and standards. Australia is also starting to see operating platforms in Adelaide and a few smaller areas around the country. The panel agreed that the right platform will foster innovation and that commercial reality would spin from there.

Bottom up or top down?

Catherine Caruana-McManus, Founder of Giant Ideas, says we need to encourage public access IoT networks for smart cities.

Catherine Caruana-McManus, Founder of Giant Ideas, cautions that applying the correct business model needs to accompany platform implementation. And that means cultivating the right mindset. "Uberisation has really transformed what is happening in cities. I'm strongly focused on this bottom up approach which is driven by what people really want. Hence, we need to encourage public access IoT networks for smart cities that are crowd funded and driven by people's needs. We don't need to wait for permission by Government, but to get on with it as security and standards will evolve accordingly."

Kevin Bloch sees things differently. He cites McKinsey's worldwide survey of the key characteristics of successful businesses and governments. "Top of the list is leadership. If the leadership doesn't get behind it, then you've got a struggle on your hands."

Producing irresistible business cases

Peter Runcie, Leader of Future Cities, Transport and Infrastructure, Data 61 says it is possible to translate smart city infrastructure spend into dollars saved.

A lot of smart city IoT implementation will cause major disruption and incur huge costs. That means solid business cases have to be presented. Peter Runcie says it is possible to translate smart city infrastructure spend into dollars saved. It might be by the life extension of physical assets through smart sensing or by the reduction in negatives such as traffic congestion and air quality that have measured impacts on GDP.

Jonathon Gregory cites digital licensing as a solid business case. Licensing covers payments for a lot of social and business activities and by 2019, 70 percent of all license transactions can be digital. "At the moment, getting any sort of license or permit is very clumsy. I think IoT, combined with a voluntary digital identity, will free up any license application process for people and save the government money."

Shifting the status quo

As the only government employee on the panel, Jonathon Gregory does acknowledge that in any digital revolution, there will be challenges to the existing rules and regulations and the industries that operate under them. "I'm talking about the way capital and structures are set up to maintain specific parameters. Uber is a good example of how individual things can challenge these. I'm all for (digital) revolution by the way, get on with it. Don't wait or there'll be a subcommittee before you know it."

Gregory advises disrupters to be aware that not everyone is moving at the same pace. "Bear in mind, for example, that 400,000 government employees – nearly 15 percent of employees in this state – do not work in a mobile, let alone app or IoT, environment. That's a $58 billion investment per year into maintaining the status quo." This will change and the NSW Government is focused on delivering workforce mobility, but it is not an instant process or easy transformation.

Gregory anticipates further disruption occur to capital markets so more investment supports innovation rather than focusing on existing technology, infrastructure and service solutions. However, he cautions that while IoT will disrupt the heavy investment in the status quo, there will be resistance from established markets, investors and enterprises.

Finding your project champion

For Peter Runcie, Sydney's Harbour Bridge is a good example of how advocates at a leadership level in organisations make things happen. In this case, NSW Roads and Maritime Services had been maintaining the bridge using decades-old, proven standard industry practices. The asset manager for the bridge realised the potential of IoT technology to supplement these practises by providing real-time information using thousands of sensors installed on the bridge together with machine learning data analytics.

Runcie explains that leadership of the technology initiative came from the asset manager. "He managed technical risk by engaging Data61 on a small research project. When that risk was mitigated, he moved us to a slightly larger project, and so on it went." Along the way, the manager lobbied within Roads and Maritime Services by demonstrating results and gaining industry recognition to secure top-level support. Runcie notes: "We need champions like this who identify opportunities and spread success stories around."

Choosing where to start

Piers Hogarth-Scott points out that a major challenge with cities is where to start implementing IoT. "Quite often, government or infrastructure organisations will say they want to become smart. Then they are bombarded by lots of vendors with shiny pieces of technology. But it is really hard to work out where to actually begin."

A starting point, is to do an inventory of the services a city provides to the community. "Many cities don't have a full catalogue of the services they provide," he explains. Often, land or facilities gifted over 100 years ago may not sit on a register or have a responsible body assigned to them.

"Once you understand those services, you can start working through the various initiatives and associated business cases for them, which might not always be monetary."

Catherine Caruana-McManus argues that IoT entry points will not necessarily come from government. "They'll come from entrepreneurial innovations around major problems in areas like housing, food, transport and heating," she says. A typical pain point for supermarkets, for example, is that their trucks can't load up in residential areas. They often have just 50 minutes to load the truck, get the food into a supermarket and leave. "So their business cases for investing in smart city IoT are around just-in-time delivery and reduction of fuel use. These are existing pain points that need fixing now."

> "A major challenge with cities is where to start implementing IoT."
>
> Piers Hogarth-Scott

Who is responsible for encouraging innovation?

Jonathon Gregory, Executive Director of Business Operations, The Department of Primary Industries, NSW points out that NSW Primary Industries has been running an internal incubator over the last 9 months.

So is there a government role in introducing disrupting technologies? Jonathon Gregory thinks they are learning. "Governments are seeing that when a logical disruption appears, they can dredge up archaic policy and rules to try and fight it. But actually, the public is going to sit there and say; 'Are you kidding me?' And in a democracy, that carries weight. Governments do adapt, like with Uber. But democracy is deliberately thoughtful and slow. That's what you want."

On the up side, Gregory points out that NSW Primary Industries has been running an internal incubator over the last 9 months to get ideas from its 3,500 staff. "We've received over 500 submissions. We are also working much more publicly with our partners by putting the technology or data out there earlier. We used to wait until we had the story according to a nice academic journal, but not anymore."

Cisco's Kevin Bloch warns about the need for government leadership around security systems. "Half of all IoT things coming into the home are going to be produced by companies that are less than 3 years old. They are going to have access to your Wi-Fi, data and devices. Now, do you think those companies are seriously considering security? The answer is most probably, no."

Gregory noted, that while not able to speak about innovation policy on behalf of the NSW Government, there would be an announcement outlining innovation policy later in the year that would provide a framework to guide engagement. While individual departments will continue to address innovation issues, the policy will provide a framework and direction for whole of government engagement with citizens and industry.

Lessons from incubator programs

Eitan Bienstock, Founder of Everything IoT Australia and Managing Partner at Propeller Venture Capital highlights lessons for Government from Israel's incubator policy.

Bienstock noted that Israel's incubator policy has been running for a number of decades and the Government has learnt two important things about their role. First of all, it doesn't get involved. The government does not operate anything. It leaves that to the innovators and business. Secondly, there is one rule across all their funding bodies – only pay money directly to the innovators, whether start-ups, entrepreneurs or corporations, and never to middlemen or programs or anyone else that is in between.

Catherine Caruana-McManus explains that her company, Giant Ideas, is trying to implement IoT in a whole host of business engines and government departments.

"My point is that Government doesn't know what your IoT or smart city solution can do unless you tell them your stories. We all have a responsibility to tell our success stories and back them up with evidence. Then, when a good thing an organisation could use comes to light, they can act on that and put forward their own business cases."

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One journey with lots of potential IoT touch points

City of Sydney Councillor Linda Scott points out that there is so much potential for IoT to better our lives, and that we cannot afford to miss this technological wave.

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Linda noted: "As a society, we don't want to lose the jobs, economic development and, most importantly, the improved liveability that will come out of this revolution."

Forum panel speakers:

Catherine Caruana-McManus, Founder of Giant Ideas

Peter Runcie, Leader of Future Cities, Transport and Infrastructure, Data 61

Jonathon Gregory, Executive Director of Business Operations, The Department of Primary Industries, NSW

Kevin Bloch, Chief Technology Officer, CISCO (ANZ)

Piers Hogarth-Scott, Director, Digital Consulting at KPMG Australia

Moderator: Eitan Bienstock, Founder of Everything IoT Australia and Managing Partner at Propeller Venture Capital

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