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EPISODE THREE:
KEY TAKEAWAYS

The IoT Show delves into topics on Industrial Internet of Things (IIoT) and touches on the broader Internet of Things (IoT). We pick engaging, hot topics, and ask our speakers to advise on situations, opportunities, recommendations and gotchas so that listeners can benefit from the experiences and insights of others.

This document is not intended to be a complete representation of views of either the host or participants or a more formal white paper on topics discussed; it's more an aide memoire of comments made by show participants. To watch this episode in full, please go to this page.

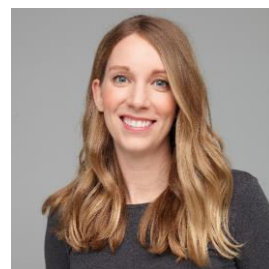Episode 3 we're discussing topics around smarter, connected cities and buildings. The host and three guests were:

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What's the case for IoT/IIoT for Smarter (buildings)?

Up to 40% of the world's energy is used within buildings, and roughly 75% of the costs of a building (over its lifetime) are in areas of building maintenance and operating expenses. If one can minimize energy usage by monitoring and optimizing, this has huge effect on running costs.

Buildings are also responsible for up to 40% of greenhouse emissions. So using IoT/IIoT to optimize usage especially during peak hours can bring demand down. This also allows one to build in degrees of resilience across connected networks of buildings (cities), allowing, for instance, power sharing. This becomes even more important when one considers that some buildings are becoming net producers of energy, not merely consumers.

Smarter (buildings) doesn't necessarily mean a new build. A lot of the infrastructure (and sensors etc.) is already in place in existing structures. What also proves insightful is a means to overlay real, measured data with digital models; allowing owners and cities to better understand, and leverage information to understand cause and effect; what it was meant to do, vs what it actually does.

Why should we be thinking of Smarter (cities)?

Cities have aspirations and timescales that span decades, and the case for Smarter is, as per many other investments based on the tenets of:

- Making money

- Saving money

- And avoiding (or reducing) risk

Cities have (business and civic) drivers, in the same ways as other 'businesses'. Clean air, safety, traffic and having an economically viable environment where people and businesses can prosper, among them. There is a difference between being Digital and being Smart. One can be Digital but not Smart. Smart is much to do with using technologies (such as IoT/AI and Machine Learning) to improve one's living environment, reduce pollution and energy consumption, for example.

There's much that Smarter can add to innovation in cities, but the case for Smarter (technologies) and projects is just like any other investment. The business case must be first and foremost financial (and clear). But there are also other benefits. For example, (employing IoT) to support a low emissions zone in a city. There's financial benefit which may, of course, be used to fund or invest in new infrastructure. But this zone will also help to improve air quality and deliver better living standards. Perhaps also, fewer premature deaths as a result of lower particulates and NOx. (Oxides

of nitrogen and gases that may react to form smog and acid rain). Unfortunately, the industry isn't particularly good at measuring some of these extended benefits.

There are some areas, for example occupancy insights, that may appear at first sight to be 'sexy'. But it's sometimes more difficult to justify investments in these areas. Topics such as improving energy usage are simpler to value, and there's generally lots of historical data available on consumption and trends, which, in turn, makes it easier to prove benefits.

Becoming Smarter

It's sometimes overwhelming to know where and how to start. Here are some guidelines:

- Wherever possible gather insights from existing infrastructures. (Perhaps using exiting meters and sub-meters).

- It's not advisable (for those just beginning) to start anew. Implementing new sensors and new systems takes too long and might not offer best (short term) ROI.

- It's simple to connect two data streams, and (most) every company, building and city has multiple data streams available from existing infrastructures. Start small. Combine some data, analyze it and build a (simple) application that provides incremental benefit on what you're doing today. The more you do, the more you'll be able to unlock benefits that are (currently) out of reach.

- Prioritize and pick your battlefield around pressing topics and consider whom might benefit from the project; the citizen, the building owner (commercial), the city (governmental) or a utility (a bit of both) perhaps?

- Think of the (city) problem as one of a system of systems. It'll be much easier and break down the problem to a more bite-sized form; perhaps consider focusing on one area among those of buildings infrastructure, energy, water, sewer, rail, road for example.

- Grow your sophistication as your experience grows and create success based on small, incremental steps.

- By 2020 there will be over 30 billion devices connected to the internet, so there definitely won't be a shortage of data. What will be needed is what one might take

from this data. What types of actionable insights one can make, and what (perhaps real-time) actions you can take. You can use AI and Machine Learning to better understand what might be interesting from the data you're collecting.

Getting to the get-go

One must be open minded about digitally connecting (previously disconnected) infrastructures, and it doesn't take a lot to start; a platform, the ability to connect data streams and an application that solves a problem. Bear in mind that the platform is merely an enabler, not the solution.

One might even consider pushing concepts (and data) out to citizens. They can contribute to your innovation process, as can educational and research establishments. Perhaps consider open sourcing your data sets to incite more involvement, and third-party applications. You may even want to investigate crowd-sourced options.

Go to vendor companies and ask them for some demonstrations. Start a pilot and touch and feel the technologies available before investing significant monies.

Find a problem where the solution is simple and valuable, and work with companies that are interested in finding solutions to your problems; those prepared to invest in your outcomes, will grow with you, and with whom you can build a trusted relationship.

Some words to the wise

Faced with increased urbanization, it's expensive and (often more) difficult to create new infrastructure. It's (often) much more effective to improve and optimize what one already has.

Don't be too fixated on the technology. Your focus should be first and foremost on the problem you're trying to solve. Then, where you'll get the data streams to develop from, then the analytics. AI and Machine learning will transform what we take away from our data sets and allow us to find new/more ways to optimize our buildings and cities.

For new infrastructure, make sure it's digital from the outset. History shows us that we're good at defining digital at design stages, but not so through construction, where a lot of digital intelligence is lost. In most cities, infrastructures are old, and remember that one can't make it smart until it's digitized.

Don't chase the shiny new technologies. Focus on what matters to you, and the use cases you care about. Pick technology partners that will grow with you and allow you to feedback recommendations to improve their technologies.

Some final thoughts.

IoT can be a tad daunting. If it is, play with it. Get a Google Home, or Amazon Alexa and touch it, try it. You might be surprised at how this may incite your (work oriented) innovation.

Focus on what citizens can see and understand and get benefit from. Subtle improvements can disrupt cultural status quos, so take care not to upset the apple cart.

Having said this, if you don't connect your infrastructure, you will fall behind. You won't be able to improve, optimize and bring costs down. People vote with their feet, and your customers and citizens will vote by leaving your buildings and cities.