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.

In episode 1 we look at some of the basic questions on the Industrial Internet of Things. The host and three guests were:

Allan Behrens

MANAGING DIRECTOR AND PRINCIPLE ANALYST TAXAL

Bill Boswell

VP OF MARKETING, CLOUD APPLICATION SOLUTIONS MINDSPHERE AT SIEMENS

Diego Tamburini

PRINCIPAL INDUSTRY LEAD AZURE FOR MANUFACTURING MICROSOFT

Dr. Josef Waltl

GLOBAL SEGMENT LEAD, INDUSTRIAL SOFTWARE AMAZON WEB SERVICES

First off, it's always useful to define a frame of reference. The IIoT is the IoT on steroids (quotes Bill Boswell from Siemens). It's IoT in the context of industry and industrial application; connecting many thousands, possibly millions of sensors (and actuators) across devices and/or equipment across the internet; often in brown-field sites. Companies benefit from the data from those sources, to get insights and deliver actionable outcomes and activities.

Why is the IIoT important and how does one justify investments?

Investing in IIoT can add to a company's top line; increasing revenues and adding new, potentially disruptive revenue streams. It can help deliver more sales, upsell opportunities and can foster new business models using interesting scenarios such as product-as-a-service.

IIoT investments can improve the bottom line by removing wastage and expense; improving on energy consumption, reliability, efficiency and serviceability of products and equipment. It can also help meet and exceed on operational KPI's by improving product and equipment performance, uptime and maintenance strategies. Those with large capital goods for example, will find that IIoT investments in areas of predictive maintenance will likely show excellent, short-term returns.

IIoT can help deliver better experiences and improved satisfaction to both internal operations and to customers. Better products, improved understanding on product and internal equipment; what's being used, what's not and where one might prioritize investment and development efforts.

How does one get started?

Firstly, never underestimate the potential complexity of an IIoT/IoT project

Before you start your first project, **plan**.

What are you good at? What's your expertise and what should be your IIoT/IoT focus. For instance, do you have the resources and knowledge to delve into more sophisticated artificial intelligence (AI) or machine learning projects from day one?

Your project scope, choice of platform, partners and degrees of project complexity can be made fit to your circumstances. For example, do you want to be a machinery company or an analytics company? It's very important to understand these sorts of distinctions and the resources they'll require; perhaps, the data scientists and the data analysts needed on staff. Especially true when you're a small, or medium sized business.

Focus on one business problem or opportunity. Understand exactly the situation you're aiming to improve or challenge that you want to address. Are you trying to make money or save it? Don't try and do both in one go.

Make sure you've conducted a "proof of value." If the value is amorphous, you won't be able to measure success.

Start small and grow in complexity; for instance, in the number of devices and sensors you connect to, or in the number of standards that you want to employ.

Cloud-based, higher level offerings allow smaller companies to get going faster than custom projects.

You can always expand once you proven success, perhaps by adding more analytics, AI and machine learning. All of these add to the software burden, requiring new skills and more team members. Having said this, it may be practical to find partners to help augment your (perhaps limited) resources.

Remember, you can always start with a partner, and as your needs or sophistication demands, develop and replace with your in-house expertise.

You might want to think to start with small, perhaps even competitive IoT development or project teams. Aim to fail fast and often, but learn from your experiences.

What's the data you'll need to solve the problem? From the get-go, plan to use simulated data. It'll take time to get real data and you may not have data-producing devices/sensors ready for some time.

Machine learning algorithms and AI thrive on data and don't magically 'start working,' rather they learn over time (and data). Having said that, start collecting real data as soon as you can.

Make sure you completely understand and decide on what sensor parameters define success and failure.

The more (failure and good) data you have, the more reliably you can predict failure and the better you are able to train machine learning models.

Learnings and gotcha's

Don't underestimate the complexity of what you may be trying to achieve.

Be aware of the frictions that may be created between different parts of the organization. Maybe those teams that are connected now due to common use of information, KPIs and new (big) data sets. Perhaps IT and OT (operational) and lines-of-business vying over (solution) ownership and implementation strategies.

Work with vendors and partners to understand what's common, off-the-shelf vs. bespoke and custom.

Don't be surprised when your customers demand coverage beyond your 'normal' geographic boundaries. Plan for world-wide usage and you won't be caught out. With broader use and internationalization come the problems of compliance. What regulation and certifications will you need to consider?

Consider that you'll be successful. Your need to ingest and process data in the terabytes more quickly than you expected. Plan to scale fast.

Pricing can be hard to predict and budget. How you architect your solution, how many devices you'll connect, where and how to store and service your data, how much data and where will it be analyzed all play a part in the cost equation.

Make sure you consider latency. A round-trip to the Cloud may not be acceptable and you may need to process information closer to the device.

For those on the fence, any last words of wisdom?

Speak to your customers, be they internal or external. Make sure what you're planning will meet or exceed their needs.

Start small. Take baby steps and show success in increments. Try something online first but get on and learn.

The biggest risk is in waiting, and the opportunity costs are high. Your competitors will most likely be doing something, even if you aren't.

Define a (small) Scrum team; perhaps with industrial, software and electronics members. Include those with a passion for IIoT and IoT and have them led by a champion. Reinforce with management commitment and motivation.

Finally, don't expect what you develop today to be in place in future years. There's lot of innovation in the space and there'll be much change to what will be possible and how to employ it.

Get started!