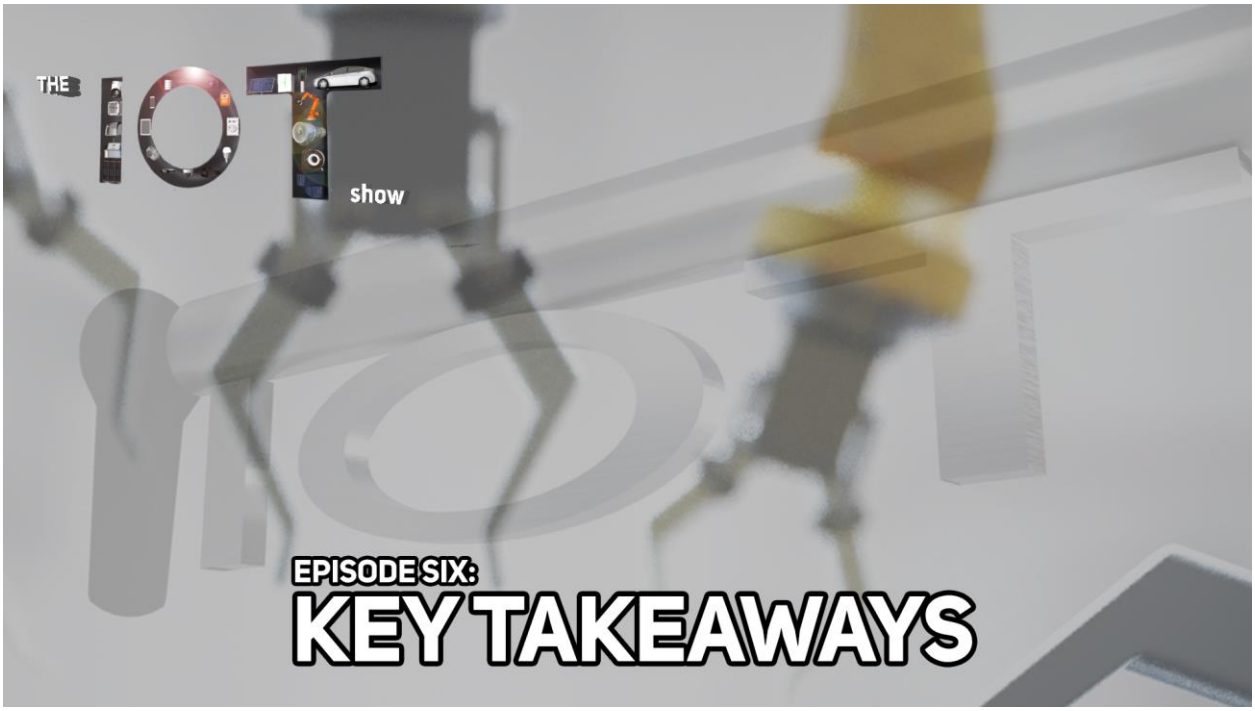

The IoT Show delves into topics on Industrial Internet of Things (IIoT) and touches on the broader Internet of Things (IoT). We pick engaging, hot topics, and ask our speakers to advise on situations, opportunities, recommendations and gotchas so that listeners can benefit from the experiences and insights 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 6 In the series, we discuss the era of Automation and how that sits with the IIoT. Our host and guests were:

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What is Automation in the Age of the IIoT?

Automation takes on many meanings dependent on the industry.

Historically automation was focused on the assets; assets being PLCs or embedded devices, for example. Automation was getting the asset to do what one wanted it to do.

Now it's more about assets integrated into the broader company and a transition from the 'asset' to 'the enterprise'. Basically, taking information out of asset and integrating that data with processes beyond direct connection of the 'asset' itself; production facilities, warehousing, ERP etc.

Shifts in automation demand that more data be made available from equipment to help improve efficiencies beyond the (immediate and) traditional. An example would be to help understand how well equipment performs across a range of SKUs (Stock Keeping Unit); using that information to decide on products best manufactured on specific machinery (or lines).

Asset level data is however, an essential constituent of automation; it allows you to compare devices, lines and plants. It helps discover bottlenecks, and aids in the company's continuous improvement efforts. Gathering (more) information and making it more available leads to better decision making and in turn, leads to a more operationally efficient organization.

New visions of automation lead to reinvention. Business-reinvention, smart products, selling products as a service are only available once you have the skills and digital infrastructures that allow for these initiatives.

What about Robotics?

Robots are party to innovations seen across the broader IIoT. Some robot manufacturers are putting sensors in their products to help deliver zero-downtime; data, analytics and a swathe of measurements (on and off device) to help maintain todays robots and/or predictively manage and minimize downtimes.

Critical (sometimes called gateway) machines need to be available 24x7 and uptime is all-important. Understanding when machines are going out-of-tolerance or are about to fail allows one to order spares and proactively address potential (and/or probabilistic) issues.

The ultimate objective is to have downtimes approaching zero hours, with no process bottlenecks.

Ideally one wants digital infrastructures in place so that (IT systems such as) ERP and Sales systems can talk directly to robots. The aim being to achieve a practical lot size of one.

There are quite a few companies that don't believe they're advanced enough to use robotics. Getting robots to interact with existing machines is simple and practical. For example, for loading or unloading machines, perhaps lathes or milling machines. Also, look to use automatic guided vehicles in your warehouse.

Today's machines aren't necessarily just one asset. They can be combinations of different robots and machines working together to perform a task. Robotics might be considered as the means to glue together different subsets of processes. This allows companies to better deal with personalization and the (ultimate) lot size of one.

Historically there was a mix of robotics and 'hard automation'. Automation traditionally being less costly. More recent commoditization of robotics and price reductions have driven a change to how one might build machinery. Any operation requiring more than 2 axes of motion is an opportunity to use a robot (vs hard automation). The benefits aren't just in price and flexibility; the inherent connectivity of robots is a benefit too.

Companies often fail to take best advantage of the flexibility of robotics. Flexibility not only on the use and application of the robots, but so too the software one uses to build, test and deploy the robots (and automation systems). The use of robots requires companies to develop new skills and approaches. Ultimately, their proposition allows companies to better compete with lower labor cost economies.

What about disruption?

These (types of) technologies are not necessarily 'disruptive'. They're certainly changing the way we think about automation and the way we're connecting machinery. Disruptive (to the speaker) is a step function and we're (probably) not there yet. Once you start to combine AI, machine earning etc., that's when it starts to become disruptive. For example, companies are working with visual systems for use in bin-picking applications for robots.

Imagine teaching a robot what a teddy bear looks like. Then using it to pick bears out of a box of mixed objects, as would a human operator.

To quote William (Ford) Gibson, “The future is already here, it’s just not evenly distributed”. Disruptive technologies are indeed in use at a few companies.

Technology evolutions (or disruptions) affect different parts of the organization at different rates. For example, the planning team might have a different view on how disruptive something is vs the quality team.

Disruption is certainly here for those thinking on topics of network connectivity, and how to take data and prepare it in a way to take advantage of things like advanced analytics. This is probably good for IT departments as they are more likely better equipped to understand and deliver on advanced topics such as advanced security models.

Any advice for companies that might have to deal with employee concerns on the future of automation?

The RIA (Robotics Institute of America) has a lot of data on this but in general, as robot sales go up, unemployment falls.

The media is somewhat to blame on concerns; on one hand they comment on how robots are going to take jobs, but then publish a few days later that this is a good thing and how new jobs will be created.

We have found (and research supports this) that as companies become more automated they hire more people.

Automation is not being put in because companies want to get rid of people; they’re automating because they can’t find enough good talent. The skills gap is real.

Automation is not a threat to jobs. It’s not going to replace, it’s going to change. To accommodate these changes, we may need to change our titles, and do new things.

Are we ready for this change? Technology is easy, it’s people that are hard. We’re going to see an increasing pace of change and this will be difficult for some people. The best way to cope with this is to involve people from the get-go and have them involved in the decision-

making process. When change is mandated (top down) people find it harder to deal with, whereas if they're part of the process, and a stakeholder, it's easier to accommodate.

Involving one's people in the change also helps to take best advantage of the corporate (IP and latent) knowledge that in-part makes companies successful. Social (and other) studies help us better understand change management approaches and how to deal with people in similar circumstances.

What to do next?

First and foremost, involve your people. Get your factory level operators involved. Talk about what processes work and what don't. The problem may not necessarily be at the point of pain, it might be due to circumstances upstream.

Start small. Once you see success, go to the next larger process. DON'T go from 0 to 100 in one fell swoop.

There's a skill set that needs to be built up by your people. Not just operators, but for mechanics, the IT department and for others.

Companies want a structured approach that allows them to understand benefits, ROI and payback periods etc. But bear in mind it's not just about operational efficiencies and throughput, it's about consideration of quality (and other things), and soft and hard skills.

It's not just about automation. Look at your processes, both horizontal and vertical integrations; warehousing, supply chain management, ERP systems, partners, design, process design, and so on. It can be (or get) complicated, so start with a clear understanding of where your benefits will be, and step-by-step success targets.

Don't automate everything (at once). Recent examples show this doesn't work. Run some (one or two) pilots first. Perhaps start with a design thinking session to decide on these pilots. Start small but think big.

Consider how you might scale and adapt based on your projected needs. The change of pace of products today is much greater than ever before; what were multi-year product lifecycles are shrinking to months. You need scalability and variability to cope; also consider production volumes and the range of products. To robots, remember that they're flexible and eminently redeploy-able which helps.

Traditional ‘old’ software, on-premise ERP as an example, was quite difficult to swap out because of the scale of the projects. Cloud based software changes this dynamic.

There might be contention between operational departments and the IT department. Cloud (is more elastic and) can scale much more easily than on-premise, and, of course, there are many, many new standards out there, some of which may or may not be relied upon in the long term. Companies thinking long-term need to make sure what works today, stays working.

Industrial IoT will (understandably and always) be different from Smart Homes/consumer IoT. Smart home devices might be replaced every few years, products like smart fridges etc. having potentially shorter life-spans. Industrial IoT however requires consideration over much longer lifecycles.

Also, IIoT edge devices are becoming cost-effectively more powerful. It’s important that companies take care to efficiently manage software that’s deployed to their edge devices.

Where do you go to for advice?

Find an integrator (or Systems Integrator) that can help; someone that does it for a living.

Share and discuss best practices with others in your, and adjacent industries.

Look to trade organizations such as the RIA, the A3 (Association for Advancing Automation) for data and help. They look at the technologies coming down the road and how manufacturers can apply them.

Look at (often hidden) pockets of knowledge you may have in your own organization. You may be surprised and have underestimated the amount of experience some of your people have.

Go to events. Not just to see what’s available but also to talk with your peers. One generally finds people in similar (perhaps non-competing) companies are open to sharing experiences and best practices.

On-line resources are useful. YouTube etc. But be aware that not everyone online knows what they’re talking about…