Powering Up in 2018

By Stephen Mellor, Cheryl Rocheleau & Howard Kradjel

With the flip of the switch, we've powered into 2018; illuminating the challenges, shedding light on burgeoning tasks of delivering a trustworthy Industrial Internet of Things (IIoT) in which the world's systems and devices are securely connected and controlled to deliver transformational outcomes.

The Industrial Internet Consortium (IIC) is explicitly interested in all vertical domains that can be considered 'industrial'.[1] For example, we have an interest in manufacturing, transportation and energy, to name just a few. We wish to add value to operational technology experts in all these domains, and more. But we are also interested in *interoperability* between those domains. An electric vehicle, for example, needs to interoperate with transportation infrastructure, and it needs to interoperate with the electric (smart) grid. Moreover, this electric vehicle comprises a large number of manufactured components as well as an astonishingly large amount of software. These components have to be able to interoperate *with every single sector*, and each sector has its own architectural requirements, yet they all need to work together. Testing for interoperability is a primary reason for IIC's testbed program.

This poses a problem for the IIC: we can't do everything at once. While there is value in breadth (otherwise how could we talk about interoperability?), we have to have enough depth to be able to talk credibly about how IIoT can be usefully incorporated into a given vertical. Then we might be able to be useful.

This is why the IIC has instituted 'focus areas,' which are vertical domains where we contact the experts, build liaisons with their various bodies and companies, inspire testbeds and so on. This

---

[1] We have built a taxonomy of vertical domains and sectors to help us organize use cases, among other reasons, but the 'taxonomy' is necessarily an enumeration based on an abstraction: what does it mean to be 'industrial'?

The technical drivers for IoT and IIoT are much the same: low-costs sensors and computing, facile management of large amounts of data analytics and so on. But the business drivers are different. In consumer-oriented IoT, cost is key, while in *industrial* IoT, return on investment is more important. Similarly, security is important in IoT, but a failure of security in an industrial setting can be fatal.

For example, we would likely consider 'Retail,' with point-of-sale terminals and little else to be mostly an IT system. Connect it to a global supply chain with additive manufacturing, logistics and automatic re-stocking and the business drivers cause the system to have 'industrial-strength' requirements. That's what would make this system 'industrial,' not that it's a retail application.

takes time, of course, at least six months, we think. Appropriately for the first half of 2018, our focus is *energy and utilities*.

Because these verticals and systems are global, we must partner with bodies that are experts in that area. This includes technical work, of course, but it also involves stimulating interest. This is the background for the first event of our Global Event Series focused on Energy and Smart Grid, partnering with the US-based National Institute of Standards and Technology (NIST) and hosted by The MITRE Corporation. The Global Event Series will continue with its focus on Energy on May 25th in Espoo, Finland, immediately following the 2Q2018 Member Meeting in Helsinki. Additional information on this and all upcoming IIC events may be found on our Resource Hub at www.iiconsortium.org/events.

GROUP ACTIVITIES

IIC's newly formed Automotive and Automotive Security Task Groups fired up with their first full member-meeting sessions in Reston. The task groups will provide IIoT guidance to the automotive industry vertical and direction to the IIC's activities in automotive.

The Security Working Group met with IIC liaison organizations with the intent of making progress toward turning requirements into standards. This group also published an Endpoint Security Best Practices whitepaper, a concise document that equipment manufacturers, critical infrastructure operators, integrators and others can reference to implement the countermeasures and controls they need to ensure the safety, security and reliability of IoT endpoint devices.

The Safety Task Group published a whitepaper addressing critical aspect of trustworthiness and a major concern in many IIoT systems. Safety is defined as "the condition of the system operating without causing unacceptable risk of physical injury or of damage to the health of people, either directly, or indirectly as a result of damage to property or to the environment". The Key Safety Challenges for the IIoT whitepaper highlights four key challenges, explains why the current safety frameworks and approaches are inadequate, and recommends how the greater IIoT community should address them.

The Smart Factory Task Group offered a webinar entitled "Create a Green Patch in Your Brownfield: Getting Started with IoT in Manufacturing" as a companion to the recently released whitepaper on the topic.

The Business Strategy Task Group released the video interview "Capitalizing on the IIoT: Using the Business Strategy & Innovation Framework." The video highlights the IIC Business Strategy and Innovation Framework and how its approach of offering guidance and best practices derived from industry experts facilitates an organized, disciplined approach to moving forward with IIoT.

The Liaison Working Group formed an Open Source Task Group that will identify open source-related requirements in IIC deliverables; including open source requirements identified in the I³C initiative, technical reports, toolkits, use cases, testbeds and best practices.

The Mining Task Group published an on-demand webinar "Applying IoT in Mining: Current Capabilities & Future Pathways." This is the first webinar of a series focused on the challenges and opportunities of the industrial internet in mining.

LIAISONS

The Liaison Working Group continues to approve and pursue strategic technical relationships. There are thirty-five liaisons in place, one liaison newly approved and more are being considered.

Joint workshops are held from time to time between the IIC and a liaison organization. A liaison workshop was held with oneM2M on February 8th. The joint workshop explored:

- interoperability between emerging horizontal technologies that will enable scalability across vertical industries,
- how the IIC testbed program is helping to drive standards development and delivering insights into specific industry requirements and
- complex challenges, best practices and reasonable expectations for short and long-term success.

Two new strategic liaison agreements were signed: The National Electrical Manufacturers Association (NEMA), to align efforts to maximize interoperability, portability, security and privacy for the industrial Internet. The second is the MulteFire Alliance in which we will work together to promote the digital economy by harmonizing various aspects in the fields of the industrial internet.

TESTBEDS

Testbeds provide an environment for companies and multi-disciplinary stakeholders to team up and prove out complex systems and gain real-world experience. With 26 approved testbeds (and more in the pipeline), participants are generating best practices, recommendations and priorities for standards organizations. In our first-quarter meeting, there were fifteen testbed update presentations, along with concept testbed introductions and testbed platform presentations.

The Testbed Working Group recently announced the following:

- Deep Learning Facility, targeting buildings & facilities and energy & utilities market segments. The testbed partners and IIC members are: Dell EMC, Toshiba and Wipro.
- Connected Workforce Safety will demonstrate how IIoT can be employed to improve worker safety and worker well-being, while facilitating safety compliance and enabling safe work practices. In turn, this testbed ensures safe work operations in industrial workplaces.

INDIVIDUAL CONTRIBUTOR AWARD

The Steering Committee awards program recognizes some of the innovative contributions driven by IIC members. The award category for this quarter was the Technical Innovation Award. The award was given to Mr. Dirk Slama (Bosch Software Innovations). Dirk was recognized by his peers for his leadership and innovative work for the Business Strategy and Solutions Working Group. His nomination cited his ability to define and execute focused projects meaningful to the industry. Specifically, his contributions to business modeling and his initiative to build the I^3C portal as part of the Industrial Internet Interoperability Coalition (I^3C), a member initiative within the Industrial Internet Consortium

NEW VIDEOS

We have seven new videos featuring and promoting the work of IIC Members. These are available on the IIC public website, and they may also be used by members to bring additional visibility to the work of featured employees and the overall IIC ecosystem. Be sure to check out these great promotional tools featuring many familiar faces:

- Business Value of Membership
- Why We Build Testbeds
- Journal of Innovation
- IIoT Challenges & Opportunities
- Industrial Analytics Framework
- Security Demonstrator, in conjunction with Plattform Industrie 4.0
- Importance of Time Sensitive Networking/TSN Testbed Demo

VALUE OF PARTICIPATION

IIC members gain experience they could never have as a non-member. They experience member meetings unlike any local meet-up groups. Looking for ideas on how to get involved and make a difference?

- Engage your customers and end users by inviting them to IIC Public Forums, or consider testbed participation.
- Help increase IIC presence at vertical industry events by referring us to program committees and applying to CFPs.
- Promote testbeds and collaborate with testbed teams, nominate your testbeds for strategic industry awards.
- Explore new and engage with existing liaison organizations.
- Create education and awareness of IIC foundational documents through social media and on your public websites.
- Promote more cross-IIC integration by contributing Use Cases, Experience Reports and Insights documents.
- Invite additional participation within your organizations – solution architects, marketers, PR, product managers and technologists (to name a few) can all participate in various IIC Working and Task Groups.
- Map foundational documents to verticals.
- Engage your marketing team with the IIC Marketing Working group to learn about Events, Forums, Speaking Opportunities, Webinars, etc.
- Promote yourself and your colleagues as IIoT advocates/evangelists.

UPCOMING

Expect to see the publication of the Security Maturity Model. Work has begun on a "Traffic Patterns Converged in a Manufacturing Time Sensitive Network" whitepaper. The IIC will exhibit in a Member Pavilion at Hannover Messe in Germany during the week of 2018-April-23 and co-host a Security Forum with Entrust Datacard on 2018-May-10 in the Minneapolis, MN area.

On 2018-April-09, World IoT Day is celebrated around the world. The IIC will commemorate this year's event with our first IIC Virtual Summit, dedicated to the application of foundational technologies needed for the advancement of Industrial IoT in business and vertical industries. We will host a series of educational, live and on-demand webinars throughout the day. Kick-off begins April 9th UTC -12 at the International Date Line and ends on April 9th UTC +12.

YOU'RE INVITED!

One representative who recently joined the IIC commented that his first meeting "exceeded his wildest expectations." Why not join us!