The Industrial Internet Consortium (IIC) held its 2018 second-quarter member meeting May 21st ~ 24th in Helsinki, Finland. It was as busy and productive as usual, with 30 testbed sessions and 68 other sessions.

The ecosystem task group organized a successful business-to-business connection event called 'IIC Connect' that attracted 53 participants and resulted in 72 interactive sessions. Each session is a twenty-minute meeting between members to use the ecosystem to their advantage.

These meetings and the other ecosystem activities are designed to allow members to work together to find partnerships that fill gaps in their own offerings and to expand possibilities. Although testbeds are the 'pointy end' of IIC, they are enabled by the ecosystem that the IIC has created. It is, after all, the very rationale for its foundation. The founders realized that the typical industrial internet of things (IIoT) system is too deep to be managed (or owned) by one company, so collaboration is a necessity. Moreover, there are many verticals that make up IIoT, some of which are not presently considered so. Take, for example, retail, which for many people is little more than a point-of-sale system with inventory management at the back end. But what happens when you connect your store directly to the factory's enterprise management systems? Or to the logistics necessary to deliver the product to the store? It becomes industrial, with industrial-strength requirements, and thus another industrial vertical. Multiply depth by breadth and you are forever working to build partnerships one-by-one. You need an ecosystem to facilitate rapid discovery and development of the partnerships you need.

THE EXTERNAL ECOSYSTEM

That notion extends beyond the IIC. The Liaison Working Group, for instance, holds joint workshops from time to time between the IIC and a formal liaison organization. Two workshops were held during the second quarter and more are to be planned for the future.

- An IIC/OSGi joint workshop, Building Industrial Internet Solutions with OSGi, was held on 2018-05-24. The workshop followed the IIC member meeting in Helsinki and was open to the public. The goal was for the IIC's Liaison Working Group and the OSGi Internet of Things Expert Group to work together to gather requirements to tailor and extend OSGi specifications to address specific industrial internet scenarios.
- The 2nd IIC/IVI Joint Workshop, Sharing Use Case Information, was open to the public and held in Tokyo, Japan on 2018-06-01. The workshop focused on sharing IVI and IIC use cases.

We also need to *work* with existing liaisons, so an especially set-up group is working to identify which standards are in use (or *should be* in use) for the testbeds. This also extends the range of organizations with whom we might want to create a liaison for more formal work. For example,

- The retail operations group is collaborating with the Object Management Group, National Retail Federation Association for Retail Technology Standards Task Group.
- The automotive security task group is engaging with automotive organizations to collaborate and identify requirements intended to influence standards activities.
- The standards group is working with testbeds and other groups to find the most pertinent standards and explore key standards' development organizations (SDOs).

THE INTERNAL ECOSYSTEM

We spare you the details of our internal organization because that's a bit narcissistic, but the collaboration between groups is also key. For example, the security group is working with:

- business solutions group regarding the business impact of trustworthiness,[1]
- business strategy group to align the IIC's Business Maturity Model with the IIC's Security Maturity Model,
- US National institute of Standards and Technology (NIST) to review NISTIR 8200, Interagency Report on Status of International Cybersecurity Standardization for the Internet of Things (IoT) and
- use cases group to add security use cases.

The Security Working Group checks *every* prospective testbed to determine its security posture.

Similarly, the connectivity group is working with the:

- automotive group to identify standards, particularly as they relate to automotive,
- networking group on upcoming white papers and
- Time-Sensitive Networking testbed on more upcoming white papers.

Since its formation, the vocabulary group has always worked across the IIC to ensure consistency of IIC's deliverable terminology and is currently working with the:

- IT & OT group on standardized definitions in support of its upcoming white paper,
- architecture group to refine definitions in support of upcoming deliverable releases and
- connectivity and distributed data interoperability and management groups on terms.

[1] Trustworthiness is defined in the Industrial Internet Security Framework (IISF) as the degree of confidence one has that the system performs as expected in respect to all the key system characteristics in the face of environmental disruptions, human errors, system faults and attacks. The needs of IT and OT must both be met.

To complete other work in the several groups, the Technology Working Group has formed an Industrial Artificial Intelligence Task Group to work across all groups to understand analytical techniques for deriving meaning from industrial internet systems.

Liaisons and Regional Teams

The Liaison Working Group continues to approve and pursue strategic technical relationships. The IIC's LWG currently has 38 liaisons in place and three liaisons are newly approved.

Regional teams facilitate local IIC activities in native languages and overcome cultural and time zone differences to accelerate the adoption of the Industrial Internet. Two regional teams have been established so far; the India Regional Team (IRT) and the German Regional Team (GRT). The IRT held its first meeting on 2018-05-10 at the NASSCOM Center of Excellence in IoT in Bangalore, India. The IRT also hosted a public forum on the topic of Accelerating the Industrial Internet on 2018-05-11. The GRT, established in 2015, continues to conduct numerous activities with the goal of connecting German IIC members and supporting the IIC's visibility in the German market. During this quarter the GRT held a second workshop of the GRT IIC research group where results of the researchers and IIC artifacts were presented.

Regional teams are yet another example of ecosystem work. Contacts and more information about regional teams are available at the Regional Teams site.

Testbeds

Testbeds provide an environment for companies and multi-disciplinary stakeholders to team up, prove out complex systems and gain real-world experience. With 29 approved IIC testbeds and more in the pipeline, participants are generating best practices, recommendations and priorities for standards organizations. The meeting had 16 testbed-update presentations along with five concept testbed introductions and testbed platform presentations.

The Testbed Working Group recently announced the new Optimizing Manufacturing Processes with Artificial Intelligence Testbed for the Manufacturing: Industrial Automation (automotive components) market segment. Wanxiang Group is the testbed lead and its supporting members are CAICT (China Academy of Information and Communications Technology), China Unicom, Dell EMC, Thingswise and Xilinx.

Publications

Five new publications were produced during the second quarter. Three publications specifically address testbed insights while two white papers elaborated on security concepts and built on concepts of the Industrial Internet Security Framework (IISF).

Testbed Insight Publications

The IIC Time Sensitive Networking (TSN) for Flexible Manufacturing Testbed published Time-Sensitive Networks for Flexible Manufacturing Testbed: Characteristics of Converged Traffic Types. The paper describes industrial traffic types that the IIC TSN for Flexible Manufacturing Testbed supports and enhances the traffic type descriptions from the IEEE 802.1Q specification.

IIC members Real-Time Innovations (RTI) and Wipro Limited, leaders of the Communications & Control Testbed for Microgrid Applications testbed supported by IIC members Cisco and National Instruments, published the Synchronized and Business-Ready Microgrid insights paper.

Insights of the recently completed Manufacturing Quality Management (MQM) Testbed are described in the IIC Journal of Innovation article Outcomes, Insights and Best Practices from IIC Testbeds: MQM Testbed. The MQM testbed focused on using quality as the key to manage and improve existing brown-field manufacturing processes.

White Papers

The Security Working Group published the Endpoint Security Best Practices white paper that describes the best practices 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 Security Maturity Model: Description and Intended Use white paper builds on concepts identified in the IISF and provides a path for IoT providers for evaluating and enhancing their security mechanisms. This white paper is the first of two documents covering the security maturity model (SMM) and provides an introduction to the SMM. The second document will be a practitioner's guide and provide details on the SMM.

WEBINARS

Ten webinars were published during the second quarter and four more are upcoming. You may receive notification about the upcoming webinars by subscribing to the IIC BrightTALK channel.

The most recent webinar, "Applying Industrial IoT for a Business-Ready Microgrid" discusses new approaches to address operational challenges by integrating communications and control technology directly to the power grid.

Nine webinars were presented as a part of the first IIC Virtual Summit conducted on 2018-04-09 in honor of World IoT Day. IIC members came together to present the Webinars, sharing overviews of foundational technologies needed for the advancement of IIoT in business and vertical industries. Over 250 people attended the events on the day.

2Q18 Member Award Winner: Testbed Award

We are pleased to announce that Dr. Kym Watson, Scientist at Fraunhofer IOSB, is the winner of the IIC's Q2 Testbed Award. Dr. Watson was recognized by his peers for his leadership and contributions to the IIC. His nomination cited his key contributions to the Testbed Working Group, his excellent co-leadership of the Smart Factory Web Testbed and his speaking on behalf of the IIC and the Testbed Program at IIC public events and industry events around the world. The award was given to Dr. Watson by the IIC Steering Committee at the Helsinki member meeting on 2018-05-21. Congratulations to Dr. Watson for this well-deserved award.

Global Event Series

The IIC's Global Event Series (GES) events extend ecosystems by partnering with key organizations around the globe and presenting thought-leading advancements to accelerate adoption of the industrial internet. The events are open to the public. Our second GES event, held at Nokia's Executive Experience Centre in Espoo, Finland on 2018-05-25, focused on IIoT Energy and Efficiency. Experts addressed topics in areas of energy and utilities, energy efficiency, smart mobility and smart cities.

These events are aligned with vertically-oriented focus areas selected by the IIC. Energy was selected in 4Q17 as the initial focus area. Focus areas are instituted as a means to engage with vertical domains and experts within the domains to build liaisons, inspire testbeds, and so on. The intent is to build momentum within a vertically-oriented area and enable that area to continue on its own so the IIC can then move onto the next focus area. The process can take some time (approximately 6 months). With energy having been the IIC's focus area for two quarters now, the IIC is now transitioning over to Intelligent Transport Systems (ITS) as its next focus area.

The third quarter GES event, the ITS Forum, is planned for 2018-09-14 and will be co-located with Hannover Messe Fair USA. IIC member, B&R Automation, will also be hosting a networking reception at their booth at IMTS, adjacent to our GES event. We hope to see you in Chicago!

NEW MEMBERS

Please join me in welcoming the following new members to the IIC:

- University of Stuttgart - Institute for Control Engineering of Machine Tools and Manufacturing Units (ISW) (Germany)
- Internet of Things Association (Russia)
- China Unicom (China)
- Smart Factory (Kunshan) Co., Ltd. (China)
- LHP Engineering Solutions (USA)

Come and join us! After all, one representative from the above said that his first meeting "exceeded his wildest expectations". This could be you!

The Industrial Internet Consortium is the world's leading membership program transforming business and society by accelerating the Industrial Internet of Things. Our mission is to deliver a trustworthy Industrial Internet of Things in which the world's systems and devices are securely connected and controlled to deliver transformational outcomes. Founded by AT&T, Cisco, General Electric, IBM and Intel in March 2014, the Industrial Internet Consortium catalyzes and coordinates the priorities and enabling technologies of the Industrial Internet. The Industrial Internet Consortium is a program of the Object Management Group® (OMG®). Visit www.iiconsortium.org.

IIC members gain experience they could never have as a non-member. They experience member meetings unlike any local meet-up groups. Here are some key benefits of membership:

- ***Networking***—Make the connections; find the needed expertise.
- ***Information & News***—A fast pass to newsworthy industry developments.
- ***Competitive edge***—Stay ahead of the competition, or take advantage of changes and developments that might otherwise have passed you by.
- ***Create a market***—Join a collective voice supporting a single mission; create the disruption in the market and develop the business opportunities.
- ***Success***—Members are building businesses and dedicating their professional lives to IIoT. They want to be successful, and they want others to succeed.
- ***Professional development***—Grow your career, meet mentors and mentees, career prospects.
- ***Solve important problems***—and help your partners and customers.
- ***Events*** – Capitalize on opportunities for continuous exposure to industry developments.