

The Industrial Internet Consortium (IIC) is the world's leading membership program transforming business and society by accelerating the Industrial Internet of Things (IIoT). Because it is global, we hold our quarterly meetings in different regions, most recently in Singapore in September. The meeting was well-attended, notably, as intended, from the neighborhood.

The (northern) summer quarter has been busy in terms of publications, testbeds, events and liaisons. We also created two new groups. The Academic Task Group facilitates collaboration with academic and research institutions globally to build reciprocal relationships and advance education, training and fundamental research between the IIC and accredited academic institutions. The Networking Contributing group will explore infrastructure technologies in OSI Layers 1, 2 and 3 as they relate to IIoT. (A "Contributing Group" has a limited life span. In this case the "exploration" will lead to a decision as to what to do next: ignore it, work with the Connectivity Task Group, become a Task Group in its own right, or something else).

But enough of our internal machinations! What have we achieved?

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. The purpose, of course, is to generate "outcomes": results, learnings, successes and even failures. The outcomes from testbeds are the cornerstones of a feedback loop from concept to reality and back to guidance for further innovation. While individual testbeds have been publishing insights specific to their testbeds internally, to our liaisons and in our [Journal of Innovation](#), a broader perspective across testbeds can add value. Accordingly, we published the report, [Why We Build Testbeds: First Results](#), in September 2017.

The report, [Why We Build Testbeds: First Results](#), is the first report to consider results from across testbeds and begin to categorize and draw inferences about testbed results. When taking the broader perspective, it became clear that there are not only learnings from the testbeds themselves but also learnings taken from the process of result collection and aggregation. In particular, results come in a variety of types, from high level, business-oriented results to low level, implementation-oriented results. While testbeds and their results create guidance for further innovation, understanding the results across domains and vertical industries requires structure. The structure element is being addressed, in part, by the

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[Industrial Internet Interoperability Initiative](#) (I3C) activity that will allow other organizations to access testbed results, use cases, architecture patterns and best practices, and contribute to them.

The testbed program includes ongoing review and approval of new testbed proposals. Two new testbeds were recently approved:

The [Smart Factory Machine Learning for Predictive Maintenance Testbed](#): The testbed is led by two member companies: Plethora IIoT, a company designing and developing cutting-edge answers for Industry 4.0, and Xilinx, the leading provider of 'All Programmable' technology.

The [Digital Solar Plant Testbed](#): The testbed is led by IIC members Larsen & Toubro Infotech (LTI), a global technology consulting and digital solutions company, and GE Digital and will deploy in multiple phases at an L&T Solar plant in Rajasthan, India, beginning in early 2018.

LIAISONS

The [Liaison Working Group](#) continues to approve and pursue strategic technical relationship. New liaisons established in Q3 include:

- [ABII \(Industrial Internet Brazilian Association\)](#) - a non-profit organization created to accelerate the growth of the industrial internet in Brazil, formed by companies and institutions nationwide.
- [The Avnu Alliance](#) - a community creating an interoperable ecosystem of low-latency, time-synchronized, highly reliable networked devices using open standards.
- [The Edge Computing Consortium \(ECC\)](#) - a world leading organization driving edge computing industry development in Internet of Things (IoT) area, consisting of industrial and academic members that work on promoting open cooperation.
- [EdgeX Foundry](#) - an open-source project building a common interoperability framework to facilitate an ecosystem for IoT edge computing.
- [The Manufacturing Enterprise Solutions Association \(MESA\) International!](#): a worldwide not-for-profit community of manufacturing companies, information technology hardware and software suppliers, system integrators, consulting service providers, analysts, editors, academics and students.
- [oneM2M](#): the global standards initiative that covers requirements, architecture, API specifications, security solutions and interoperability for Machine-to-Machine and IoT technologies.

GROUP ACTIVITIES

Working groups, task groups and contributing groups continue to make progress on their key activities and deliverables. A few highlights include the following:

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- The Industrial Analytics Task Group completed the [Industrial IoT Analytics Framework](#) technical report.
- A new Networking Contributing Group was formed by the Technology Working Group.
- The Safety Task Group is finalizing a *Key Safety Challenges for the IIoT* white paper.
- A new P2413 Standard Architectural Framework IoT Contributing Group was formed by the Liaison Working Group
- A new ISO/IEC JTC1/SC 41 IoT Reference Architecture Contributing Group was formed by the Liaison Working group.
- The [IIC Connect](#) event continues to be arranged at each quarterly meeting by the Ecosystem Task Group.
- A new Academic Task Group was formed by the Marketing Working Group.
- The Smart Factory Task Group completed the [A Practical Way to Get Started with IIoT: Cultivate a "Green Patch" in Your Brownfield](#) white paper.

Each of the groups is active and focused on creating impactful results. All group activities and priorities are reported to the membership. This one-stop-shop enables all members to learn about what the groups are working on and locate the contacts needed to get involved.

PUBLICATIONS

Publications during the third quarter included:

[The Industrial Internet Vocabulary Technical Report V2.0](#) was published in June and provides a basis for effective communication within the industrial internet ecosystem, and a common set of terms and their definitions that the diverse set of stakeholders in the industrial internet can use to communicate ideas effectively.

The [IIC Industrial IoT Analytics Framework Technical Report](#) (IIAF) was published on October 24th. It is the first IoT-industry technical document to include a complete set of instructions that IIoT system architects and business leaders can use to deploy industrial analytics systems in their organizations.

The white paper, [A Practical Way to Get Started in Manufacturing IIoT: Cultivate a "Green Patch" in Your Brownfield](#), was published on November 14th.

JOURNAL OF INNOVATION

The IIC publishes the *Journal of Innovation* each quarter highlighting innovative ideas, approaches, products and services emerging within the industrial internet. The theme of the

September 2017 edition is “Edge Computing”, a theme selected by the IIC’s Thought Leadership Task Group and supported by contributors throughout the membership. Download individual articles directly from the table of contents below or download the complete September 2017 edition of the [Journal of Innovation](#).

- [Where is the Edge of the Edge of Industrial IoT?](#)
- [Device Ecosystem at the Edge - Manufacturing Scenario](#)
- [Edge Intelligence: The Central Cloud is Dead – Long Live the Edge Cloud!](#)
- [Outcomes, Insights, and Best Practices from IIC Testbeds: Microgrid Testbed](#)
- [A Knowledge Graph Driven Approach for Edge Analytics](#)
- [Industrial IoT Edge Architecture for Machine and Deep Learning](#)
- [A Practical Guide to Using the Industrial Internet Connectivity Framework](#)
- [What’s New at the Industrial Internet Consortium](#)

VIDEOS

Several new “[Voices of the IIC](#)” Videos were published to support and describe recently released technical documents.

Industrial Analytics: Members of the Industrial Analytics Task Group discuss how to apply advanced analytics to machine and process data for deriving new insights and enabling transformational business outcomes. If data is the new fuel, data analytics is the new engine. View this video [here](#).

Business Strategy and Innovation Framework: As the IIoT transforms businesses and changes the competitive landscape, collaboration and mastery of new skills will be essential to business success. Several authors of the [Business Strategy and Innovation Framework](#) (BSIF) share a conversation around issues that any enterprise will need to address, and offer an organized, disciplined approach to moving forward successfully. View this video [here](#).

Industrial Internet Security & IIC: A veteran member and co-author of the [Industrial Internet Security Framework](#) presents his global perspective on the need for industrial strength security systems throughout all industries. He and his team have built and established a successful company and renowned reputation for groundbreaking work in the IIoT security field, and he shares how IIC membership has played a role in their success. View this video [here](#).

There are more videos available at the IIC video library: www.iiconsortium.org/video-library

IIC EVENT ACTIVITY

The IIC again participated in the [IOT Solutions World Congress \(IOTSWC\)](#). At IOTSWC the IIC featured demos, testbeds, innovators and thought leaders within the IIC member pavilion, the exhibit floor and on the Congress stage (over 100 IIC members presented). Testbeds and demonstrations included:

What We Did on Our Holidays

- [FOVI Testbed](#): Often buried and in various formats, background and contextual data requires vast amounts of storage and data distribution resources. The Factory Operations Visibility & Intelligence (FOVI) Testbed simulates a factory environment, enabling visualization of results that may be used for process optimization.
- [TSN Testbed](#): Time Sensitive Networking (TSN) is an enhancement to Ethernet. The TSN Testbed applies new TSN technology in a manufacturing system with a wide range of automation and control vendors to display the new capabilities and value of TSN. This IIC testbed was selected as the [IOTSWC Best Testbed Award](#)!
- [Smart Factory Web Testbed](#): This testbed has created a network of smart factories to improve order fulfillment by aligning capacity across production sites with flexible adaptation of production capabilities and sharing of resources, assets and inventory.
- *Industrial Trustworthiness demonstration*: This is an evolution of a demonstration started at [Hannover Messe 2016](#): a real-time security and interoperability demonstration highlighting collaboration between members of the Industrial Internet Consortium and Plattform Industrie 4.0.

The IIC and [Plattform Industrie 4.0](#), along with local partner, Agency for Science, Technology and Research ([A*STAR](#)), presented an [IIoT World Tour](#) event in Singapore. The event featured several speakers and panels. Presentations from this event are available on the [event webpage](#).

ANNOUNCEMENTS

In addition to these events, the Marketing team has been working on [press releases](#). You can always find the latest record of IIC members featured in the news [here](#). Here's a selection of IIC press releases:

- [IIoT World Tour – The Industrial Internet Consortium and Plattform Industrie 4.0 Collaborate in Singapore on September 15, 2017](#)
- [The Industrial Internet Consortium Publishes First Testbed Results](#)
- [The Industrial Internet Consortium Announces the Digital Solar Plant Testbed led by LTI and GE Digital](#)
- [Industrial Internet Consortium Launches Smart Factory Machine Learning Testbed](#)

TECHNICAL INNOVATION AWARD

The Steering Committee instituted an award program to recognize some of the great work you can see being carried out in the IIC. The award category for Q3 was Testbed Contributor Award. The award was given to Dr. Mitch Tseng (Huawei Technologies). Congratulations, Mitch!

Mitch was recognized by his peers for his leadership and contribution to the [Manufacturing Quality Management \(MQM\) Testbed](#). His nomination cited the importance of the testbed in “modernizing and increasing the efficiency of China’s manufacturing facilities necessary to maintain manufacturing performance and to reduce the impact on the environment.”



NEW MEMBERS

We are pleased to announce the following new members.

- [ATEK Access Technologies \(USA\)](#)
- [Atomsystem Co., Ltd \(Japan\)](#)
- [BP International \(United Kingdom\)](#)
- [CABASE-Camara Argentina de Internet \(Argentina\)](#)
- [China Wanxiang Group \(China\)](#)
- [Chongqing University \(China\)](#)
- [CSA Group \(Canada\)](#)
- [Dun & Bradstreet \(USA\)](#)
- [Entrust Datacard \(USA\)](#)
- [JTEKT \(Japan\)](#)
- [Kx Systems \(Northern Ireland\)](#)
- [Ligado Networks \(USA\)](#)
- [Netsnapper Technologies Sarl \(Luxembourg\)](#)
- [OnBoard Security \(USA\)](#)
- [Pacific Northwest National Lab \(USA\)](#)
- [Pilz GmbH & Co. KG \(Germany\)](#)
- [Praetorian Group, Inc.\(USA\)](#)
- [Texas Instruments \(USA\)](#)
- [TRUMPF GmbH + Co. KG \(Germany\)](#)
- [Turkish Industry & Business Association \(Turkey\)](#)

Come and join us!

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.