

We moved the first-quarter meeting intended to be held in Athens, Greece online with an eleventh-hour pivot to an unprecedented virtual member meeting. The Industrial Internet Consortium (IIC) member meeting, held March 9<sup>th</sup> ~ 12<sup>th</sup> was a great success with 134 attendees, 45 sessions, twelve testbed sessions, four industry sessions and three “workroom” sessions.

## MEETING VIRTUALLY

IIC meetings are misnamed. We should call them “symposia”, the definitions of which are below:

**symposium** | sim'pōzēəm | noun (plural **symposia** | -zēə | or **symposiums**):  
a conference or meeting to discuss a particular subject.

- a collection of essays or papers on a particular subject by a number of contributors.
- a drinking party or convivial discussion, especially as held in ancient Greece after a banquet (and notable as the title of a work by Plato).

ORIGIN late 16th century (denoting a drinking party): via Latin from Greek **sumposion**, from **sumpotēs** ‘fellow drinker’, from **sun-** ‘together’ + **potēs** ‘drinker’.

We certainly have meetings to create papers from contributing members. We generally break into three or four tracks covering digital transformation, technology, security, testbeds and more. That’s how we create the content you see. This time we had one virtual “room” for each track, and members could leave one virtual room for another just as they do in physical reality.

We also have convivial discussion. With a little lubrication, an enormous amount of *work* can be done. This is where general topics or areas of concern that might disrupt a formal meeting take place. The lack of formality and the ability to multitask across large tables with multiple conversations makes things happen and eases formal discussion in the following days. Happily, we are used to meeting virtually and after six years, we know most people well. We also recorded the sessions to address time-zone issues and the unfortunate reality that once your colleagues know you’re in the office, they schedule meetings with you.

So, our meeting was considerably different from our normal mode of operation. But we adapted and made progress and even enjoyed it. We spent less time in airports and airplanes, for one thing. But we missed the get-togethers.

As we can now all see it’s a new world in many ways, and it will affect the industrial internet of things (IIoT), including the digital transformation of industrial companies. It will take time (industrial investments last decades) but we have a golden opportunity to increase our resilience.

## WHAT CHANGES?

The truthful answer is that we don't know. Looking back over the two or three weeks of working from home, many of us have seen myriad changes, from quiet streets, avoiding neighbors when walking the dog, late deliveries and changes in our own attitudes. But we can see some trends.

*Retail:* For those shops that are still open, there will be a faster push to link enterprise requirements planning systems with logistics, even for small businesses. More than a simple point-of-sale system at the front end, it will be connected all the way through the value chain to the manufacturer. Order online, pick it up and it all ripples through the supply chain.

*Logistics:* We're all online shoppers now and companies are scheduling deliveries based on perceived urgency. Moreover, some products are sourced from locations that are difficult to reach or restricting deliveries. Businesses are based on just-in-time delivery of industrial goods to reduce the cost of inventory. This will increase costs above the present slowdown.

*Shorter supply chains:* Because of competition for suddenly scarce resources (reagents for testing, for instance), restrictions on delivery and difficulties in timely delivery, supply chains will likely become shorter, perhaps even limited to one country or region. Perhaps the era of globalization is over. Global travel is certainly on hold.

*Increased automation:* We already have dark factories; there will be more. Social distancing in factories and other industrial plants is possible of course, but not always, and not always efficiently. This is an impetus towards greater automation and digital transformation.

*Health care:* Some drugs can be delivered intravenously and automatically, even measuring the dose already present in the bloodstream avoiding the need for close proximity to a nurse. Connecting devices that are sold, tested, certified and deployed separately together can reduce the number of hospital staff needed. An example is a respirometer and oximeter. If either measure low respiration or blood-oxygen levels they give an alarm, which, because of the frequency with which this can happen as a patient moves, might be ignored. Were they connected so that an alarm sounds only when *both* indicate a problem, it would be safer and require fewer staff.

*Crowdsourcing infection rates:* Internet-connected thermometers are another health-care-related change. When location and elevated temperature can be [mapped](#), we can identify hotspots faster than before. In China, citizens have been given codes that indicate whether they are infected. In [France](#) and elsewhere, drones are being used to enforce lockdowns.

*Drones:* With greater use of drones in populated areas, regulations will likely change, perhaps allowing more over a greater area, including even "the last mile". In turn, that may increase acceptance of heavier loads in industrial areas.

*Transportation:* Social distancing will change transportation too. It is difficult to maintain a distance of two meters on a bus or train. Even ride-sharing services are suspect. This may drive

people back to owner-operator vehicles, or it could accelerate the spread of autonomous vehicles. This changes how we think about smart cities.

*Air travel:* This is already severely curtailed, and people are finding it possible, even if less than optimal, to work remotely. This may be what video-conferencing, [first available in 1968](#), has been waiting for. (And for those concerned about libations, people are enjoying video cocktail hours!)

*Community:* Help is available from government and from volunteer organizations, but how are people in a panic or people unused to the internet to find it? Communities can work together for grocery and prescription deliveries or to find specific help using various online tools at helpdesks. New community organizations may change how we think about smart government.



## REMOTE WORK

*IT/OT convergence:* IT and Operational Technology (OT) have different languages, concerns and emphases. But they also work in completely different environments. What will happen as “shop floor” and “office floor” become “home floor” and everyone is in similar environments?

*Business models:* Will we see time-of-day pricing for the network, deliveries and other scarce resources as we do with vehicles in central Singapore? What other innovative business models will be brought about by the current situation?

*Remote technical support:* We will see fewer technicians dispatched to locations requiring maintenance and repair. New solutions emerge daily to monitor equipment and facilities remotely, using artificial intelligence and virtual reality to engage experts at a distance effectively and reduce the cost, risks, and complexity of always having to be there.

*Telecommunications:* We are more reliant on telecommunications and bandwidth than before. Whole families are working from home, and many, craving video “contact”, are using video more too. This changes the network’s ability to respond and deliver packets to factories. This makes standards such as Time-Sensitive Networking and the [IIC testbed](#) more important than ever.

*Security:* IT security and trustworthiness of IIoT systems has always been important. With people focused on other concerns, it is obvious that it is more important than ever.

We need to become more resilient. Change will take time, but there are also opportunities. Join the conversation at the [IIC Community Forum](#)!

## THE INDUSTRY CONNECT SERVICE

As the world's leading IIoT consortium, IIC comprises leaders in the development and adoption of IIoT and emerging technologies with extensive knowledge and experience to share. IIC member experts have developed best practices, guidelines and frameworks and have applied these resources across many industries. The [Industry Connect Service](#) helps technology users transform their businesses. Users seeking solutions to large complex problems, to scale existing proofs of concept or to identify requirements for industry standards are invited to submit a problem statement. Both the user organization (which need not be an IIC member) and IIC member organizations receive direct value through identification and delivery of possible solutions, opportunities for new technology development and proofs of concepts with testbeds and test drives. If you're interested in submitting a problem statement for consideration by the IIC, please contact [Howard Kradjel](#), VP of Industry Programs.

## IIC COMMUNITY FORUM

The IIC launched its [Community Forum](#) on 2020-01-28. The Community Forum is an online venue for industry experts to exchange ideas, discuss IIoT problems and network as well as an IIoT beacon providing helpful, relevant content to technology users, vendors, integrators, technology experts, researchers, government entities and academicians. The Community Forum is a resource for follow-on conversations (on the theme above and many more), webinars and the upcoming and annual World IoT Day (#IOTDAY) to take place this year on 2020-04-09.

## INDUSTRY DAY

Smart manufacturing was featured during Industry Day on 2020-03-11. The audience was treated to thought leadership from IIC members that included: [Aingura IIoT](#), [AASA Inc.](#), [Huawei](#), [Korea Industry 4.0 Association](#), [Microsoft](#) and [Wibu-Systems](#).

## TRUSTED IOT ALLIANCE

We are excited to have combined memberships with Trusted IoT Alliance (TIIoTA) and work together under the IIC umbrella. TIIoTA has built a community of technology leaders focused on bringing distributed ledger (including blockchain) solutions to market. This consolidation will strengthen the ability of the IIC to provide guidance and advance best practices on the uses of distributed ledger technology across industries, and boost the commercialization of these products and services.

## IIoT CHALLENGE WINNERS

The series of [IIoT Challenges](#) announced in the spring of 2019 wrapped up the first round of the [Smart Buildings Challenge](#) with winners announced at [Bosch Connected World](#) in February 2020. The Smart Buildings Challenge presented contestants with a set of smart building problems faced

by building operators and investors as well as a set of parameters required of the solutions. Technology suppliers developed solitary or partnered solution proposals and competed for the opportunity to deploy pilot implementations to fulfill the requirements outlined by the challenge. A jury selected the winners from a pool of 39 entries from 26 contestants. The winners were [Cubelizer S.L.](#) who won for Smart Space Flow Analytics, [Aedifion](#) and [Thing Technologies](#) who won for both the Smart Metering in Multi-Tenant Commercial Buildings and Smart Automated Building use cases, and [Holisticon](#) and its subsidiary [Markenwerk](#) for Smart Building Cockpit.

Winners now have the opportunity to deliver a live proof-of-concept in a shopping mall supported by [Deka Immobilien](#), [ECE](#) and [TÜV SÜD](#). Technology partners providing technology for the challenge included [Bosch](#), [Microsoft](#) and [Security and Safety Things](#). Additional finalists for the Smart Buildings Challenge were: [BuildingMinds](#), [Cloud Studio](#), [G2K Group](#), [Limitless Insight](#), [Moeco](#), [Orient New Media](#) and [Umajin](#).

The IIC's recent entry into the challenge arena was assisted by our former liaison partner, Trusted IoT Alliance (TIOTA), which is now a part of the IIC as a result of [formally joining forces](#) in January 2020.

## GROUP ACTIVITY

IIC groups continue to make progress on their various activities and deliverables. You can find a complete list of IIC publications on the [Technical Papers, Publications and White Papers page](#).

We published the [Digital Twins for Industrial Applications](#) white paper on 2020-02-18, which provides practical guidance to business managers, IIoT system architects, practitioners and testbed teams on digital twin, including the definition, benefits, architectures and the necessary building blocks to implement one.

We published the [Software Trustworthiness Best Practices](#) white paper on 2020-03-23, which provides a high-level overview of software trustworthiness for developers, owner-operators and decision makers in IIoT systems. Various aspects of creating, acquiring and protecting software are addressed as well as actionable best practices for recognizing, addressing, managing and mitigating risks and their sources, whether developed inhouse or acquired.

We published the 13<sup>th</sup> edition of the [Journal of Innovation](#) addressing *Innovations in Intelligent Transportation* on 2020-03-31. Intelligent Transportation Systems (ITS) provide a broad range of innovative services for single and multi-modal public, private and commercial transport in existing and planned transport networks. Key aspects of ITS include over-the-air bi-directional data flows, connected vehicles, big data, artificial intelligence, mobility and autonomous systems.

## TESTBEDS AND TEST DRIVES

IIC testbeds are where the innovation and opportunities of the industrial internet—new technologies, new applications, new products, new services, new processes, new business

models—can be initiated, thought through and rigorously tested to ascertain their usefulness and viability before coming to market. Our testbed program has 26 [approved IIC testbeds](#) with others in the pipeline. You can also visit the [Resource Hub's testbed page](#) for more detailed testbed information.

IIC recently published a report offering key insights based on a compilation of testbed outcomes. This report, [A Compilation of Testbed Results: Toward Best Practices for Developing and Deploying IIoT Solutions](#) was published on 2020-02-20. It offers lessons learned for companies embarking on an IIoT journey based on results from a compilation of IIC testbeds that have produced successful outcomes. The white paper also offers lessons learned in project initiation, planning and management, establishing the value of platforms, dealing with brownfield constraints or limited resources, deploying supportive technologies such as machine learning and artificial intelligence and mistakes to avoid.

The [LTE for Metro](#) testbed was announced on 2020-03-02. The [Outcomes, Insights and Best Practices from IIC Testbeds: LTE for Metro Testbed](#) article was published in the March 2020 Innovations in Intelligent Transportation edition of the [Journal of Innovation](#).

The [Test Drives](#) program recently approved two test drives: [Intelligent Video](#) and [IoT Sensor Implementation](#).

## STANDARDS

Our next quarterly meeting will be held jointly with Object Management Group. The Object Management Group is a non-profit organization with several programs, including a standards development organization and the IIC program. The IIC discovers requirements for industrial systems, but it is not a standards development organization (SDO). Instead we work with SDOs to develop standards that meet our needs. That is one reason why we have built so many [liaisons](#).

Two activities stand out (though there are many more that we shall explore next quarter). One is the [Time-Sensitive Networking](#) standard to which IIC members have contributed principally through the [IIC TSN Testbed](#). The other is the [Simple Electronic Notation for Sensor Reporting \(SENSR\)](#) proposal, which is a direct outgrowth of the Track and Trace Testbed. This is in the final stages of adoption, and we hope will be ready for the next quarterly meeting. More on standards after that.

Stay safe!

## NEW MEMBERS

Please welcome new members this quarter:

- [Elrond](#)
- [Farallon Technology](#)
- [InterX](#)
- [Johnson & Johnson](#)
- [Ledger](#)
- [Manufacturing Technology Centre](#)
- [Obyte](#)
- [Shinshu University](#)
- [Slock.it](#)
- [Streamr Network AG](#)
- [Transforma Insights](#)
- Trust Driven Solutions
- [Ubirch GmbH](#)

Join the discussion at the [IIC Community Forum](#).

IIC members gain key benefits of membership they could never have as a non-member. Here are some:

- **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.
- **Establish a vision**—Work to define future architectures and innovative technologies for IIoT.
- **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.

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*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 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®).*

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