



IIC Testbed Program

IVI & IIC Joint Workshop

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<http://www.iiconsortium.org/test-beds.htm>





Agenda

IIC Testbed Program Introduction

Portfolio Overview & Use-Cases

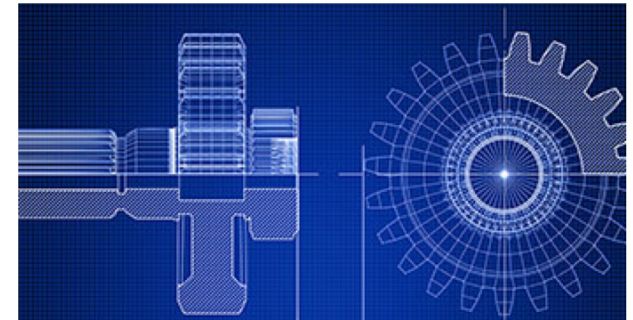
Influencing Standards

Go-to-Market Examples



SOLVING PROBLEMS THROUGH COLLABORATION

The IIoT and convergence of OT and IT brings new challenges that involves experimentation, ecosystems, and collaboration to find solutions...



Explore untested technologies or existing technologies working together in an untested manner

Initiate innovations and test to ascertain usefulness and viability before going to market

Influence standards and drive interoperability

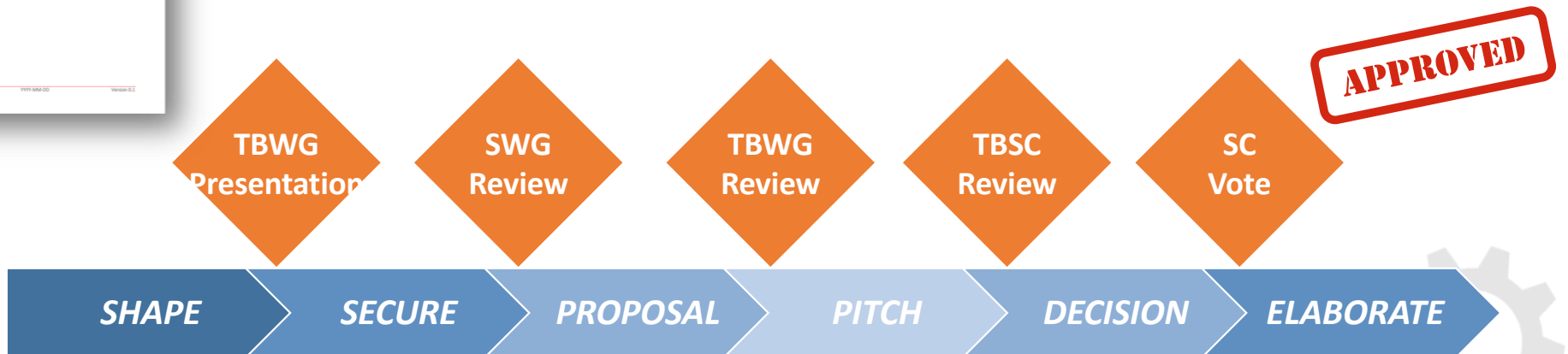
Create innovative new products, services, and business practices

Make an Impact. Answer Real Questions. Deliver Practical Value.

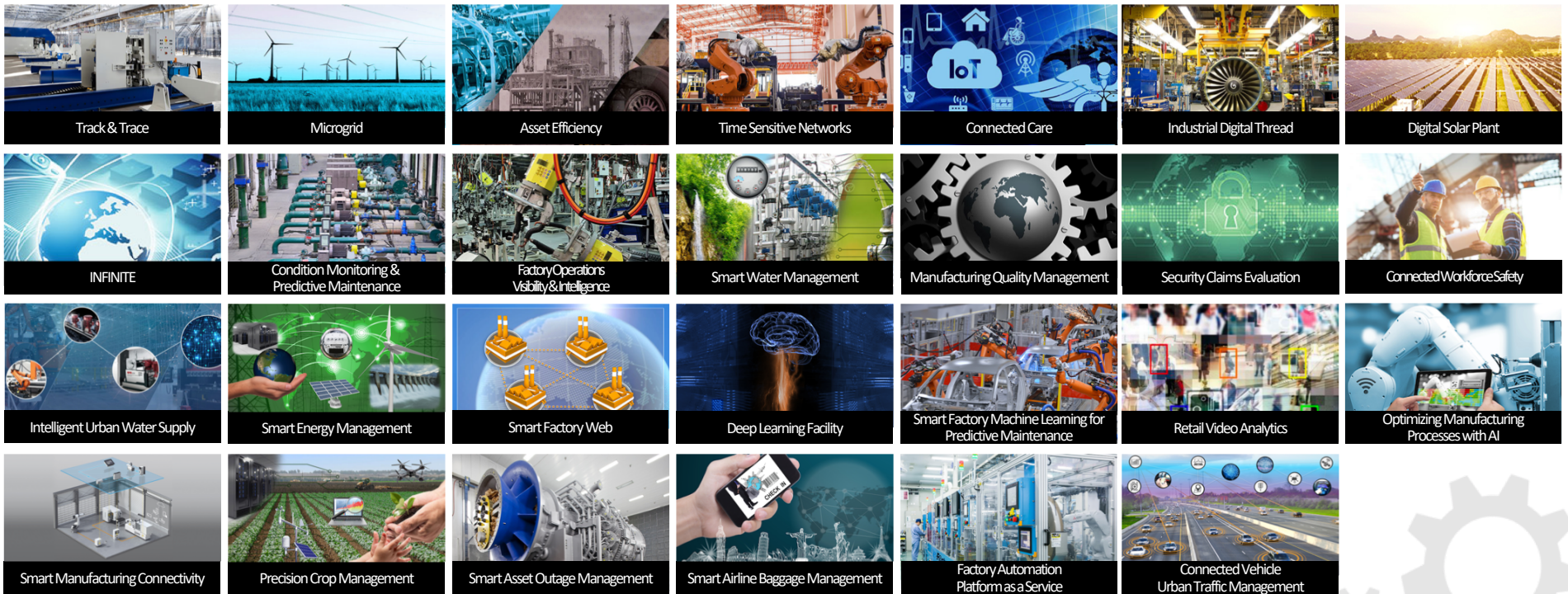




IIC Testbed Proposal Process

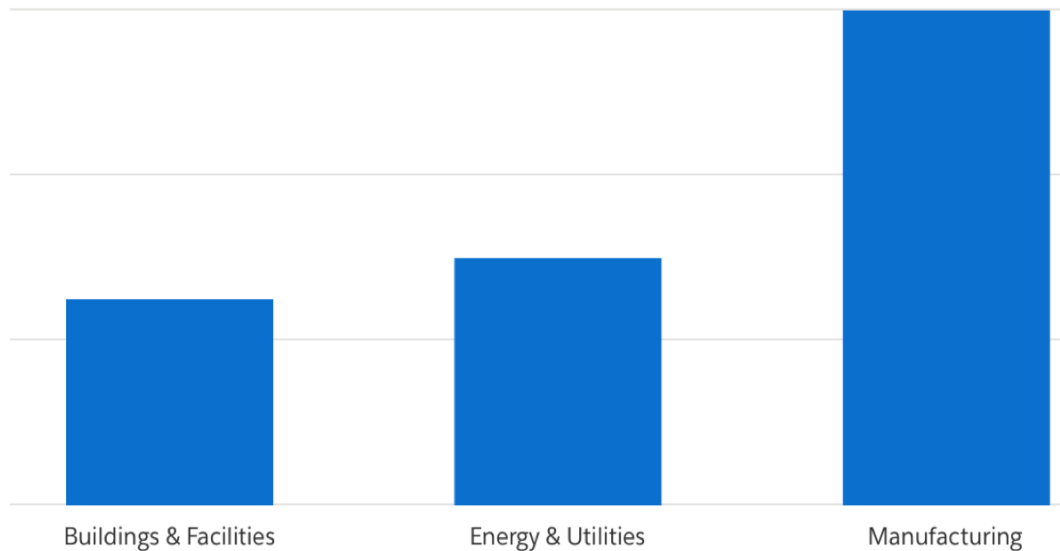


IIC Public Testbed Portfolio





IIC Testbed Industry Verticals



3 Illustrative Verticals

- ✓ Aerospace & Defense
- ✓ Agriculture
- ✓ Buildings & Facilities
- ✓ Energy & Utilities
- ✓ Environment
- ✓ Healthcare
- ✓ Manufacturing
- ✓ Public Sector
- ✓ Retail
- ✓ Technological Infrastructure
- ✓ Transportation & Logistics



Testbeds – Manufacturing



TIME SENSITIVE NETWORKS FOR FLEXIBLE MANUFACTURING

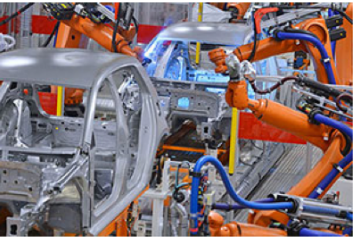
Provides real-time control & synchronization of high performance machines over standard Ethernet networks in manufacturing ecosystems
by employing new IEEE 802 Time-Sensitive Networking standards



SMART FACTORY WEB

Improves manufacturing order fulfillment

by networking a web of smart factories to align capacity across production sites with flexible adaptation of capabilities and sharing of resources, assets, and inventory



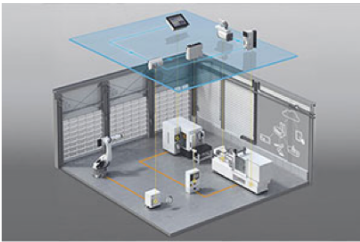
SMART FACTORY MACHINE LEARNING FOR PREDICTIVE MAINTENANCE

Increases availability and lifespan of manufacturing production systems

by direct application of machine learning strategies and time critical predictive maintenance



Testbeds – Manufacturing



SMART MANUFACTURING CONNECTIVITY FOR BROWNFIELD SENSORS

Enables high-volume brown-field manufacturing sensor data to be available at the platform tier in near real-time
by provisioning retrofit-able factory floor hardware



TRACK & TRACE

Ensures proper usage and minimizes failures of handheld power tools and forklifts
by tracking and tracing the assets collecting usage and status in industrial factory and logistics environments



OPTIMIZING MANUFACTURING PROCESSES WITH ARTIFICIAL INTELLIGENCE

Optimizes manufacturing production processes
by deploying distributed artificial intelligence and industrial apps strategically at multiple levels in brown-field manufacturing environments





Testbeds – Energy & Utilities



INTELLIGENT URBAN WATER SUPPLY

Increases urban water supply safety, reliability, and efficiency

by establishing and validating proper architectures, technologies, and business models to realize intelligent water supply operations



DIGITAL SOLAR PLANT

Improves the ability for solar plants to reliably supply energy to main power grids and reduce maintenance expenses

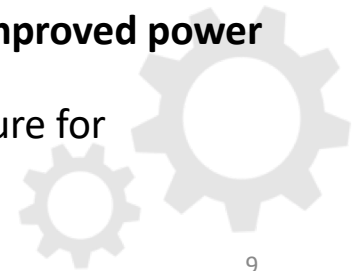
by accurately forecasting solar irradiation, reducing intermittency, and real-time condition monitoring



COMMUNICATIONS & CONTROL FOR MICROGRID APPLICATIONS

Enables efficient utilization of Distributed Energy Resources and improved power quality

by proving the viability of a real-time distributed control infrastructure for managing a smart microgrid power system



Influencing Standards

Solve interoperability issues and generate requirements for standards bodies



TIME SENSITIVE NETWORKS FOR FLEXIBLE MANUFACTURING

Standards for real-time control & synchronization of equipment over Ethernet

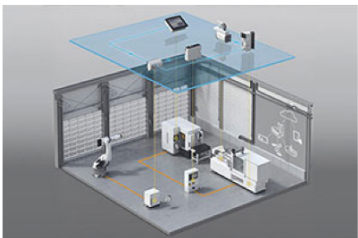
- TSN standards IEEE 802.1 and IEEE 802.3 via Avnu Alliance and IEEE (Focus area: Timing & Synchronization, Scheduled Traffic, System Configuration)
- 25+ companies collaborate on network and device interop driving standards across geos



SMART FACTORY WEB

Standards for industrial automation in manufacturing and geolocation

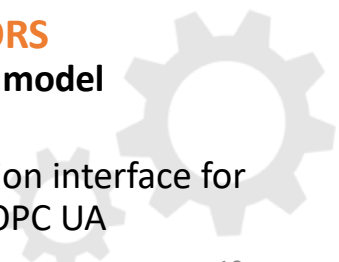
- Companion Specification OPC UA for AML (OPC UA models from AML models), DIN SPEC 16592 (exchange AML via OPC UA), OGC and IETF geospatial standards
- Uses OPC UA (IEC 62541), AutomationML (IEC 62714)



SMART MANUFACTURING CONNECTIVITY FOR BROWNFIELD SENSORS

Standards for OT/IT communication, sensor devices, and a common device model

- IO-Link OPC UA Companion Standard (for IO-Link device integration)
- Uses IO-Link IEC 61131-9 Programmable Controllers (digital communication interface for small sensors and actuators), IO-Link IO Device Description (IODD), and OPC UA





Proving Ground for the IIoT Market

27* Public Testbeds proving...

- ✓ Interoperability
- ✓ Equipment failure predictions
- ✓ Public safety & utility improvements
- ✓ Manufacturing efficiency & quality improvements
- ✓ Real-time control and synchronization of high performance machines
- ✓ Efficient utilization of renewable energy resources
- ✓ and more ...

*As of May, 2018





Furthering Collaboration

Continue to expand our collaboration with Japan and IVI as a liaison partner

Create a joint testbed that will help drive smart manufacturing advancements and showcase international collaboration between IVI & IIC

- Manufacturing and intersecting domains
- Implement IVI Use Cases
- Contribute to IIC & IVI efforts and liaison goals, drive standardization, showcase our achievements accomplished through collaboration...

