IIC Liaison Report to 802.24

July 2016

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Acknowledgments

• Stephen Mellor
• Eric Harper
• Will Sobel
Agenda

Update on Liaison Relationship

IIC Overview

Notable Updates Since Last Meeting

Final Thoughts
IIC:802.24 Liaison Relationship Approved!

- Approved
- First opportunity to see an overview
IIC Overview
The Industrial Internet

It’s an internet of things, machines, computers and people, enabling intelligent industrial operations using advanced data analytics for transformational business outcomes.

Wave 1
Machines and factories that power economics of scale and scope

Wave 2
Computing power and rise of distributed Information networks

Wave 3
Machine-based analytics, physics-based, deep domain expertise, automated, predictive

Industrial Revolution

Internet Revolution
Industrial vs. Consumer Internet of Things

**Similar Technology Drivers**
- Small inexpensive sensors & actuators
- Low cost processing power and data storage
- Smart devices
- Connectivity

**Different Business Drivers**
- **Consumer**
  - Adequate Quality
  - Modest Security
  - Cost Sensitive

- **Industry**
  - QoS
  - Safety
  - Robust Security
  - ROI Sensitive
  - Efficiency
  - New Products
  - New Markets
Impact of Industrial Internet

46% of World GDP

Global GDP ~$70 Trillion

- **Developing Economies**: $29 Trillion
  - Non-Industrial Economy: $18.1 Trillion
  - Industrial Economy: $10.9 Trillion
- **Advanced Economies**: $41 Trillion
  - Non-Industrial Economy: $31 Trillion
  - Industrial Economy: $10 Trillion

Other: $14.3 Trillion

Other: $23.1 Trillion

Industrial Internet opportunity (~ $32.3 Trillion) 46% share of global economy today
Savings and growth opportunities across every industry

1% savings from efficient Industrial Internet solutions could save billions in operational costs

$30B  fuel cost saving in aviation industry

$66B  fuel cost saving in gas powered fleets

$63B  productivity improvement in healthcare

$90B  reduction in Cap X in oil & gas exploration and development

$27B  productivity improvement in rail industry

* Projected savings are based on 1% efficiencies/savings

Source: Industrial Internet: Pushing the Boundaries (2012, Evans & Annuziata)
Roadblocks to growth

The Industrial Internet: A $32 trillion opportunity
The IIC brings together the organizations necessary to accelerate growth of the Industrial Internet by identifying, assembling and promoting best practices and technologies.

“To accelerate growth of the Industrial Internet by coordinating ecosystem initiatives to connect and integrate objects with people, processes and data using common architectures, interoperability and open standards that lead to transformational business outcomes.”
IIC Members (245 today)

IIC Founder Companies

[logos of various companies]
Business Strategy and Solution Lifecycle

- Business Strategy
- Solution Lifecycle
- Project Toolkit

IIoT TECHNOLOGIES

Project Toolkit
Testbeds and Projects

• A testbed is a *controlled experimentation platform*, conforming to an IIC reference architecture, where solutions can be deployed and tested in an environment that *resembles real-world conditions*.

• Testbeds explore *untested technologies* or existing technologies working together in an *untested manner*.

• Testbeds can generate requirements and priorities for *standards organizations*.

• Testbeds’ ultimate purpose is to culminate in innovative *products, services and methodologies*.
Notable Updates Since Last Meeting
IIC Meeting Schedule

• IIC Meetings since the last report
  • Q1 2016 Meeting
    • Reston, Virginia, USA
    • March 14\textsuperscript{th} – 17\textsuperscript{th}
  • Q2 2016 Meeting
    • Tokyo, Japan
    • June 6\textsuperscript{th} – 8\textsuperscript{th}

• Upcoming IIC Meetings and Notable Events
  • Q3 2016 Meeting
    • Heidelberg, Germany
    • September 19\textsuperscript{th} – 22\textsuperscript{nd}
  • Q4 2016 Meeting
    • Coronado, California, USA
    • December 5\textsuperscript{th} – 8\textsuperscript{th}
  • IoT Solutions World Congress
    • Barcelona, Spain
    • October 25\textsuperscript{th} – 27\textsuperscript{th}
Select Topics of Potential Interest: IIC Industrial Analytics Group

• Part of the IIC Technologies Portfolio

• Charter
  • Role
    The Industrial Analytics Task Group is part of the Technology Working Group. This Task Group will comprehensibly define the properties of realizable analytical techniques and methods for deriving meaning from, and adding value to, industrial systems. It will work closely with the various IIC groups to ensure their data analytic concerns are addressed. Its deliverables consist of a technical report detailing capabilities, requirements, existing and new open standards, and technologies, presented in an Industrial Internet Analytics Framework.
  • Topics
    The IIC Industrial Analytics Task Group’s scope will include:
    • Influence / drive requirements in other IIC teams and working groups
    • Catalog various technology choices for analytics
    • Analytics on both data in motion and at rest
    • Hierarchical and distributed considerations of industrial analytics
    • Data integrity interactions for analytics
    • Analytics for safety and security of operation

• Chairs
  • Diab, Wael William (Huawei)
  • Harper, Eric (ABB)
  • Sobel, Will (System Insights)
Select Topics of Potential Interest:
IIC Industrial Analytics Group

• Initial deliverable is Industrial Internet Analytics Framework
• Group has decided to parcel the initial work into two releases. This would allow
  • for a quick-time-to-market on the initial release
  • allow the group to brainstorm topics for the second release
  • deep dive technical areas in the second release
  • consider cross-cutting items in the second release
• Group’s target schedule is
  • Q3 2016 for first release
  • Q2 2017 for second release
• Outline of framework parallel IIRA
• Scope of 1st release
  • The drivers of analytics in an industrial system
  • The requirements of industrial analytics
  • Architectural considerations to support industrial analytics
• Second release under brainstorming. Some topics to include
  • Deep dive into technical architecture requirements
  • Cross-cutting issues such as the use of empirical data from
  • Leveraging use-cases from external organizations
• The IIAF like many of the other fundamental frameworks IIC is working on, will work with it IIRA (Industrial Analytics Reference Framework)
Final Thoughts
Final Thoughts & Feedback on Report Format

• As this is the first liaison “report”, would appreciate feedback
  • Content
    • What you liked...
    • ...and did not like
  • Frequency
    • Report out at every WG meeting if there is something new
  • Detail
    • Less, more or about the same?

• Assuming the format is acceptable, in addition to any specific items, I will pick some topics of interest (e.g. Analytics portion this report)

• As your liaison, please do not hesitate to reach out for information and I will be more than happy to assist