Industrial Internet: Standards & Disruptions

Dr. Richard Mark Soley
Executive Director
“A fundamental new rule for business is that the Internet changes everything.”

- Bill Gates, 1999

Or has it?
## Where We’ve Been

<table>
<thead>
<tr>
<th>Activity</th>
<th>15 Years ago</th>
<th>Today</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening to music</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>Watching a movie</td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
<tr>
<td>Contacting people</td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
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<tr>
<td>Reading the news</td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
</tr>
<tr>
<td>Making music</td>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
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</tbody>
</table>
Discrete Manufacturing

1980
Programming a 584 Programmable Controller

2015
Programming a 984 Programmable Controller

December 16, 2015
No, the Internet Didn’t Change Everything

There is much more to be done:

• Oil & Gas Exploration
  • Geological data integration from multiple sensing sources
• Rail & other transportation
  • Failure sensing and automatic rerouting of multimodal systems, far more extensive than JapanRail automatic stop
• Smart homes & smart energy usage
• And on... and on... and on...

• “Internet Thinking” is key to Smart Manufacturing, Smart Connected Products, and Smart Product Data
The Industrial Internet is leading the next economic revolution

Global GDP Per Capita

GDP data extracted from the Futurist 2007
There are key differences between the Industrial Internet and Consumer IoT.
The Measurable Outcome will be in the Trillions of Dollars

GE: $32.3 trillion opportunity representing 46% share of GDP today.

Cisco: Internet of Things (IoT) will increase private sector profits 21% and add $19 trillion to the global economy by 2020

Gartner: IoT product and service suppliers will generate incremental revenue exceeding $300 billion in 2020.

McKinsey Global Institute: $36 trillion operating costs of key affected industries could be impacted by IoT

The convergence of Internet of Things, Industrie 4.0, Cyber-Physical Systems presents an enormous opportunity.

Sources: GE, Cisco, Gartner, McKinsey
Making Sense of the Numbers

Revenue Generation
• Revolutionary new products & services → Creating new markets
→ Changing the way the world works

New Operational Efficiencies that drive down costs
• Workforce productivity gains → digitization of tasks, better deployment of resources
• Reduced maintenance costs → predictive maintenance
• Material, energy savings → reduced need for product over-engineering
• Reduced waste → Precision monitoring to predict and control machines

Improved Customer Satisfaction
• Improved service levels → fewer unplanned disruptions

December 16, 2015
Opportunities across every industry: GE’s 15-year outlook

Beyond the numbers, the Industrial Internet is changing how things work.

- $30B fuel cost saving in aviation industry
- 92M vehicles with Internet connectivity on the road by 2016
- $63B productivity improvement in healthcare
- $66B fuel cost saving in gas powered fleets
- 68% decrease in crime rates with video surveillance
- $90B reduction in Cap X in oil & gas exploration and development

Source: Industrial Internet: Pushing the Boundaries (2012, Evans & Annuziata)
Yet there are current roadblocks to widespread adoption
Mission

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.

Launched in March 2014 by five founding members:

The IIC is an open, neutral “sandbox” where industry, academia and government meet to collaborate, innovate and enable.
Founders, Contributing Members, & Large Industry

IIC Founder Companies

Contributing Members
Small Industry
Nonprofit, Academic, & Government

ICT Austria
Center for Business Technology
Activities fall into three main areas that ultimately drive new opportunities for IIC members:

- **The IIC Ecosystem**
  
  **Companies joining together to advance innovation, ideas, best practices, thought leadership and insights**

- **Technology & Security**
  
  **Architectural frameworks, standards requirements, interoperability, use cases, privacy & security of Big Data**

- **Testbeds**
  
  **Innovation to drive new products, processes, services**

Innovative products!
What about Standards? And Open Source?

Already plenty of standards at the communications level (e.g., OMG DDS)

**Semantic standards are going to be critical in all verticals**

IIC is a *source* for standards requirements & priorities
How will we reduce jet engine failure & maintenance costs?

How will we save lives through better patient care?

How will we reduce passenger fatalities?

How will we minimize unplanned factory downtime?

How will we reduce waste of natural resources?

Things are coming together.
For More Information

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