Leading the way in the next wave of Industrial Automation

Rockwell Automation and Cisco Systems
John Lohmann and Jared Danaraj
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A New Industrial Wave

It’s never been a better time to digitize to capture the value of the Internet of Things

Priority Investments

#1 Analytics | #2 Connectivity | #3 Automation | #4 Mobility

Drivers of Change and Challenges in Industries:
Provides opportunity to drive efficiencies and productivity to meet increased demand for production

Industry

- Urbanization
- Rising affluence of households
- Digitally empowered consumers
- Interconnected Value Chain
- Regulation, Sustainability and assurance of supply
- Product Diversification, New Product Development and Introduction
- Focusing on Securing Operations and R&D

ASEAN

ASEAN Economic Community
Productivity benefits sought from an integrated supply and value chain

Shift of Investments from China
Need to boost overall efficiencies to compete for investments

Harnessing Disruptive Technologies
Automation, Big Data and Analytics - up to 45B of economic impact by 2030

Value @ Stake in Connected Industries in APJC by 2020

$1T

75% of manufacturers making investments in service excellence, efficient innovation and responsive manufacturing

70% of global manufacturers will offer connected products

65% of companies with more than 10 plants will enable the factory floor

Source 1: Cisco IoE Study, 2015
Source 3: IDC Manufacturing Insights, 2016
Our Portfolio of Industry Solutions where Digitization provides positive outcomes to address drivers

<table>
<thead>
<tr>
<th>Digital Manufacturing</th>
<th>Digital Refineries &amp; Processing</th>
<th>Connected Pipelines</th>
<th>Connected Oilfields</th>
<th>Connected Mining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Links automation and control systems to enterprise business systems with analytics</td>
<td>Secure industrial wired and wireless solutions for the plant</td>
<td>Complete end-to-end pipeline management solution.</td>
<td>Intelligent networks connecting stakeholders with oilfield assets.</td>
<td>Sustainable operations, centralized ore monitoring, automated processing, health and safety and smart assets</td>
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<td>Delivers secure, flexible, connectivity for mobile applications, supply chain visibility</td>
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<tr>
<td>Secured plant floor and assets</td>
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</table>

**Connected Machines**
- Enable edge and cloud analytics that support predictive machine monitoring and maintenance

**Connected Pipelines**
- Complete end-to-end pipeline management solution.

**Connected Oilfields**
- Intelligent networks connecting stakeholders with oilfield assets.

**Digital Utilities**
- Grid Modernization and operational system reliability
- Cyber Security and Compliance
- Multi-service field area networks and smart metering
- Improved field communications

**Digital Transportation**
- Connecting Air, Land and Sea Transport Systems
- Improved operational efficiencies, passenger experiences
- Centralized communications for freight and logistics

Cisco IoT System Provides the Underlying Network Infrastructure
Cisco IoT System Provides the Underlying Network Infrastructure

Our Portfolio of Industry Solutions where Digitization provides positive outcomes to address drivers

- Reduce Downtime, Max OEE
- Introduce New Products Faster
- Achieve Real Time Visibility
- Better Manage Global Supply Chain
- Protect Company from Cyber Threats

- Reduced Downtime
- Incident Resiliency
- Secure Remote Access
- Operational Excellence

- Equipment Reliability
- Greater Safety
- Lower on site costs
- People & Asset productivity

- Operational Excellence
- Workforce Efficiency
- Cost Reduction
- New Business Models

- Increased ridership
- Safety
- Asset Utilization
- Safety Compliance
IT and OT Collaboration is Key to Digitization of Industries

**Transactional information:** orders, supply network, product design …

**Real-time data:** alarms, events, states, energy, diagnostics …

- **IT**
  - Cisco
    - Worldwide IT Leader
    - Digitization and IoT Market Leader, Industry-leading Architectures and proven IoT Solutions Portfolio

- **OT**
  - Rockwell Automation
    - World’s largest company dedicated to Industrial Automation
    - Deep industry domain expertise in Auto, F&B, O&G, CPG and Heavy Industries

**COMMON SECURE NETWORK INFRASTRUCTURE**

- **ERPs**
- **FINANCIALS**
- **HR**
- **LOGISTICS**
- **QUALITY**
- **WAREHOUSE**

- **INDUSTRIAL “THINGS”**
- **PLCS & SCANNERS**
- **MATERIAL & TRANSPORT**
- **MACHINES & TESTERS**
- **SHOP FLOOR PERSONNEL**
- **PRINTERS & LABEL SERVICES**
Cisco and Rockwell are driving the convergence of Industrial and Enterprise networks

Common Vision
Common system architecture, built around industry standard IP-based networking technologies, including EtherNet/IP

Infrastructure & Security Services & Solutions
Creating an ideal networking environment for both IT and OT professionals with the Stratix industrial network infrastructure portfolio and collaborative networks and security services

Converged Facility-wide Architectures
Tested and validated design and implementation guidance optimized for both IT and operations (OT)

Talent Development
Certifications, education, and training to help with successful architecture deployment and efficient operations
Joining forces to improve and scale security monitoring and management from the enterprise, to the IDMZ, and now down to the cell/area zone

1. Extend proven IT security threat detection and inspection tactics to the OT network

2. Prevent and detect network-wide incidents leveraging IT-trusted and OT-optimized deep packet inspection technology

3. Manage security risk with products, architectures and technologies in support of a Defense-in-Depth approach
Smarter
Machines & Equipment

Real-time Data
Voltage, Kwh, Running Time, Temperature

Information
CONTEXTUALIZATION
Energy/Product, OEE

Knowledge
ANALYTICS
Predict bearing will fail in 10 hours

Wisdom
OPTIMIZE
More efficient process workflows
7100KWh of energy used today

Yield will meet today’s production needs

Time to reach temperature is longer than normal

Alert Maintenance Line #1
VISIBILITY
See deeper into operations and logistics, with new ways to link processes and facilities to suppliers and customers.

COLLABORATION
Between people, between teams and departments, and even between the machines themselves.

EFFICIENCY
Transform information into insight. Increase ROI, get to market faster, and dramatically reduce waste.
CHALLENGES

- Organizational Alignment
- Competency, Talent
- Technology Adoption
- Data Security, Privacy
- Interoperability Standards
Journey to a Connected Enterprise
People, Processes and Technologies

CONNECT
• Connect plant equipment & people
• Use available, standard technologies
• Must be scalable and flexible
• Do it securely

EVALUATE
• What data is needed, from which assets, and define how it helps
• Ensure the assets are able to provide the information need

COLLECT
• Data from assets and organize to improve business processes
• Leverage information from across the plant and enterprise

PRESENT
• Contextualize it against other data
• Make it actionable & to make smarter decisions
• Put it in terminology that’s right for the user

OPTIMIZE
• Correlation & qualitative analysis of the information for process improvement
• Maximize plant workflow in a coordinated way
• Make the plant integral to B2B partners
### The Connected Enterprise

**Rockwell Automation Transformation**

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<tbody>
<tr>
<td><strong>Inventory</strong></td>
<td>120 days to 82 days</td>
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<tr>
<td><strong>CapEx</strong></td>
<td>30% per year in capital avoidance</td>
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<tr>
<td><strong>Delivery</strong></td>
<td>Mid-80s to 96%</td>
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<tr>
<td><strong>Lead Times</strong></td>
<td>Reduced 50%</td>
<td>Reduced 50%</td>
</tr>
<tr>
<td><strong>Time to Want</strong></td>
<td>82% to 98%</td>
<td>82% to 98%</td>
</tr>
<tr>
<td><strong>Quality</strong></td>
<td>50% reduction in PPM</td>
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**Productivity ➤ 4% to 5% per year**
The Connected Enterprise

EXECUTION

Assess & Plan
Secure & Upgrade
Data & Analytics
Optimize & Collaborate
25 of 40 vehicle assembly plants are currently using Spain, Turkey, China, US, Thailand, and plants around the world are now connected to the enterprise.

"Next generation automated vehicle scheduling" manages production in real-time with more than 2 million variations.
Joint Customer Success Stories in Asia Pacific

From automating plants to connecting machines

**New Zealand**
Process control network improves profitability and achieves more flexible production for 22 billion liters of milk per year at 25 Fonterra Cooperative sites

**Australia**
Manufacturing automation and IOT industrial performance network double Amcor Beverage Cans' production capacity to 600M per year and improve product quality.

**Australia**
Iron ore mine, rail, and port process-control systems simplifies operations and improves safety for Roy Hill Holdings 55M ton per annum facility.

**China**
Industrial grade IOT network for Chery Jaguar Land Rover's manufacturing automation system secures and optimizes 130K annual luxury car production.
Start your journey with us

<table>
<thead>
<tr>
<th>Strategic Vision &amp; Demo</th>
<th>Business &amp; Technical Deep Dive</th>
<th>Opportunity Identification</th>
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<tbody>
<tr>
<td>• Real business outcomes, case studies, linking capabilities to production floor care-abouts</td>
<td>• Next generation production cell (converged, SDN etc…)</td>
<td>• Brainstorm Use Cases</td>
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<tr>
<td>• Demo</td>
<td>• Connected machine and edge compute</td>
<td>• Prioritize by Complexity and Value</td>
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<td></td>
<td>• Plant-floor virtualization</td>
<td>• Run basic ROI analysis</td>
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<tr>
<td></td>
<td>• Location services</td>
<td>• Plan Next Steps</td>
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<tr>
<td></td>
<td>• Big data analytics and SXP</td>
<td><strong>Projected Business Outcomes</strong></td>
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<tr>
<td></td>
<td>• Securing the factory and new remote services</td>
<td>Energy management</td>
</tr>
</tbody>
</table>
Resources

- Websites
  - Reference Architectures
  - Cisco / Rockwell Automation Overview
  - Industrial IP Advantage
  - Connected Enterprise

- Design Guide Foundation
  - Converged Plantwide Ethernet (CPwE)

- Application Guides
  - Fiber Optic Infrastructure Application Guide

- Whitepapers
  - Top 10 Recommendations for Plant-wide EtherNet/IP Deployments
  - Securing Manufacturing Computer and Controller Assets
  - Achieving Secure Remote Access to plant-floor Applications and Data
  - Design Considerations for Securing Industrial Automation and Control System Networks

- Competency for IT/OT Engineers
  - Industrial IP eLearning
“The price of doing the same old thing is far higher than the price of change.”

Bill Clinton
Thank you.