The Connected Enterprise

Implementation of Industrial IoT to Deliver Value

Keith Nosbusch
Rockwell Automation at A GLANCE

$6.3B FISCAL 2015 SALES
22,500 EMPLOYEES
80+ COUNTRIES

Leading global provider of industrial power, control and information solutions

AUTOMATION SOLUTIONS for a broad range of industries

SERVING CUSTOMERS FOR 112 YRS
- Innovation
- Domain expertise
- Culture of integrity & corporate responsibility

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MANUFACTURING – THEN
Man and Machine
MANUFACTURING – NOW
Virtual (IT) and Physical (OT)
THE CONNECTED ENTERPRISE

Optimized for Rapid Value Creation
Transactional data: orders, supply network, product design …

Real-time data: CONTROL, SAFETY, SECURITY + alarms, events, states, energy, diagnostics, …

IT

CONVERGENCE

OT

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The Connected Enterprise Delivers

- Faster Time to Market
- Lower Total Cost of Ownership
- Improved Asset Utilization
- Enterprise Risk Management

Lower Total Cost of Ownership

Smart Manufacturing Leadership Coalition

Usine du Futur

Industrie 4.0

China Manufacturing 2025

Manufacturing Innovation 3.0

INDUSTRY CONSORTIA
INDUSTRIAL Smart Assets

- Machine to machine coordination → high speed
- Mission critical → safety, security
- Integrated control and information → self-aware + system aware

CONSUMER Smart Assets

- Less time critical
- Human centric
- Stand alone → self-aware
SMART ASSETS ARE SELF-AWARE & SYSTEM AWARE
Implementing Industrial IoT Systems

**IoT Reference Model***

1. Physical Devices & Controllers
2. Connectivity
3. Edge Computing
4. Data Accumulation
5. Data Abstraction
6. Application
7. Collaboration & Processes

*Rob Soderbury, Cisco, 2014 IoT World Forum

**Industrial IoT Technologies**

- Mobility & Visualization
- Information Management & Analytics
- Scalable Computing (Control, Edge, Cloud)
- Multi-discipline Control & Information
- Secure Network Infrastructure
- Smart Assets "Things"
A High Performance Architecture Built Upon Contemporary Technologies is Needed For Industrial IoT Systems

Smart. Productive. Secure.

TRUSTED REFERENCE ARCHITECTURE
SELF-AWARE, SYSTEM-AWARE SMART ASSETS
Most Advanced Track & Trace System in all of China for Baby Formula.

- China Food Drug Administration (CFDA)

3% Productivity Increase

Reduced production prep/dispatch time

Speeds up delivery, auto-fill BOM

7% Labor Costs
OT Infrastructure as a Service (IaaS)
A subscription for plant network, virtual server instance and 24x7x365 infrastructure monitoring

24x7 Proactive Support led to 90% Reduction in Troubleshooting Time
Virtually Eliminating Network & Server Issues

Offsite Advanced Technologies Support

ELIMINATED 100% OF CAPEX with Redundant Expandable Architecture and a Fully Managed Support Contract
Business Value Example: **Real-time Analytics**

**Contextualize**

**Analyze**

**Take Action**

SMART ASSET: TANK

DATE: 11/17/15 9:30AM

STATUS: RUNNING

TEMPERATURE: 90º

BATCH: A32468050-02

FLOW: 32 psi

FLOW: 28 psi

15%  40%

33%  22%

Real-time Analytics result in Real-Time Actions

Part #: FlowMeter 243-0c ordered for Tank XRT485Z

Replace Flow Meter Thursday, 9:30am

Divert Mixer to Tank BRT491C for Batch 04 – 09
### Real-time Analytics Implementation

#### IoT Reference Model

1. **Physical Devices & Controllers**
2. **Connectivity**
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6. **Application**
7. **Collaboration & Processes**

#### Industrial IoT Applications

- **ON PREMISE**
  - Plant-wide Smart Assets
- **IN-CLOUD**
  - Smart Assets in the Field
The Connected Enterprise in Action: CONNECTED PRODUCTION
Real-time Analytics: Prediction of Potential Failures

Monitor > Analyze / Predict > Optimize

PUMP CONDITIONS

SURFACE

DOWNHOLE

PREDICTING Failure Modes
Minimizes Unscheduled Downtime

Pump Fillage Optimization
IMPROVES Well Production
Networked Oil Wells Provide Insight Into Field Operations With Real-time Data

- Simplified Start-up
- Integrated Control
- Increased Energy Savings
- Extended Well Life
- Improved System Reliability

Networked Oil Wells

Networked Oil Wells Provide Insight Into Field Operations With Real-time Data

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“We’re making more educated decisions based on real-time and historical operations data that we can access anywhere. We’ve been able to significantly improve company profitability as a result.”

- Brian Sloan, Engineering Manager

99.5% AVAILABILITY

Business Decisions Based On REAL-TIME & HISTORICAL DATA

$2.3 M

Saved in Maintenance and Downtime
INDUSTRIAL IoT
CHALLENGES

- Competency Gaps
- Security and Data Privacy
- Reference Architecture & Standards
- Industrial Technology Refresh Cycles
- Legacy System Connectivity
World-Class Partners and Ecosystem Are **ESSENTIAL** for Industrial IoT

- **at&t**: Secure cellular, satellite connectivity
- **Microsoft**: Cloud, mobility solutions
- **Cisco**: Secure network infrastructure
- **Rockwell Automation**: COMMON SECURE NETWORK INFRASTRUCTURE
- **Endress+Hauser**: Process instrumentation
- **Panduit**: Physical network infrastructure solutions
- **FANUC**: CNCs, Robotics
- **Rockwell Automation Partner Network**: 100+ partners for automation solutions
INDUSTRIAL IoT Enhances THE CONNECTED ENTERPRISE that delivers transformational value in productivity, sustainability and global competitiveness.