Connected Manufacturing
Smart Solutions

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Agenda

• Manufacturing Industry Business Drivers
• Business Value with Connected Manufacturing
• Connected Manufacturing Smart Solutions
• Business Demos over TelePresence (BDoT)
• Summary, Closing and Questions
I need help capturing knowledge for my transitioning workforce.

How can I improve workforce productivity?

I need to improve product quality.

How do I achieve real time visibility?

How can I reduce downtime?

How can I introduce new products faster?

How do I achieve sustainability?

How can I better manage my global supply chain?
Convergence with the Internet of Everything (IoE) Addresses Priorities

Proprietary Networks

Ruggedized Infrastructure

Ethernet/IP Optimized for Industrial Applications

IoE / IoT Architectures

Connected Manufacturing – evolution of Operational Technology

Enterprise IT

Why converge networks?

- Time to market
- Security: perimeter no longer viable
- Simplicity and Flexibility: maintenance and management
- Problem resolution
- Voice, video, data collaboration
- Control of plant performance
- Remote talent
- Standards convergence … open systems
- Future proofing
Producing Tangible Business Benefits for Manufacturing Companies

**Best-in-Class Manufacturers Top 20%**
- 8 hours of downtime per year (99.91% Uptime)
- 11% total cost of ownership reduction for industrial network
- 90% Overall Equipment Effectiveness (OEE)
- +25% operating margin vs. corporate plan

67% Converged Industrial Ethernet Adoption Rate

**Middle 50%**
- Downtime: 36 hours/year
- OEE: 80%

**Bottom 30%**
- Downtime: 135 hours/year
- OEE: 60%

33% Converged Industrial Ethernet Adoption Rate

Source: Aberdeen Group 2012
Overall Business Value at Stake: 
~$2T for Manufacturing Industries

- Asset Utilization
- Employee Productivity
- Supply Chain / Logistics
- Customer Experience
- Innovation

Source: Cisco IBSG, 2013
Connected Manufacturing
Industrial Smart Solutions

Asset Utilization
Connect devices, machines, facilities with advanced sensors, controls and software apps for improved OEE

Employee Productivity
Visual plant operations, asset and people visibility, interactive and mobile plant workforce

Supply /Logistics
Inbound and outbound visibility and risk management with RFID material management, plant and warehouse mobility

Value Chain Engineering
Connecting people (enterprise, partners and customers) anytime to support R&D, Operations, Maintenance, Service Levels and Quality

Customer Experience
Omni-channel customer engagement: safer, more enabled driver experience and more cost effective design integration for Automakers

Connected Machine
Visual Factory
Manufacturing Mobility
Remote Expert
Connected Vehicle
Connected Machine

CHALLENGE:

• Minimize total costs and time from engineering order to full-production for assembly lines
• Cost effective solution with standard, OTS modular designs supported by many vendors
• Remote monitor and diagnostics with future-proof flexibility, easy-to-use configuration

BUSINESS VALUE:

• Two-thirds reduced installation, commissioning and debugging time for 10+ robotic station assembly line with single network architecture
• Reduced engineering cycles for OEM/MB using standards-based, COTS components
• 30% reduced assembly-line lifecycle TCO to End User, with increased line flexibility

End-to-End architecture for secure remote machine access, diagnostics and maintenance via Enterprise network using proven, standards-based solution
“Installation, commissioning and debugging for 10 stations with 12-15 robots takes a couple days, rather than 1-2 weeks.”

Larry Silaghi
COMAU Engineering Manager
ODVA 2012 Annual Conference
Visual Factory

**CHALLENGE:**
- Information on the plant floor is often static
- Employees need real-time visibility of safety / security, and production information
- Skill gap due to transitioning workforce
- Corporate messaging difficult to deliver to plant personnel
- Incomplete awareness of critical production data, like schedule and quality metrics

**BUSINESS VALUE:**
- Info presented dynamically throughout plant
- Training, productivity and production monitoring, with 200% faster resolution cycles
- Fewer safety incidents and risk mitigation with networked video surveillance

Deploy secure real-time access to production data to enhance plant efficiency (OEE), safety, and return on assets.
“This is about a business change, to make our manufacturing facilities more flexible, more agile and more lean.”

Kirk Gutmann
GM Global Information Officer, Manufacturing and Quality
Manufacturing Mobility

**CHALLENGE:**
- Missing components, materials and tools (jigs, etc.) cause delays in assembly
- Lack of FIFO visibility on materials with shelf life leads to excess inventory and scrap
- Utilization of machines is not optimized due to lack of real, trusted supply visibility

**BUSINESS VALUE:**
- FIFO component management and supply visibility has resulted in 20% reduction of scrap
- Automated RFID component search and tool identification along with voice-to-text processes (voice picking) has reduced cycle time by 15%
- Enhanced equipment performance with real-time visibility and access improves utilization, OEE
Remote Expert for Manufacturing

CHALLENGE:
- Globally distributed R&D, engineering, servicing expertise
- Longer cycles for engineering, production, services

BUSINESS BENEFITS:
- Accelerated time to market, minimized engineering rework
- Reduce downtime by remotely accessing systems and collaborating with partners

Transform services and cradle-to-grave models with real-time, context-rich access to experts across the Value Chain and throughout the Product Lifecycle.
Connected Manufacturing
Business Demos over
TelePresence (BDoT)
Connected Manufacturing Solutions
Lifecycle Context

Run and rebalance
Better execution of current ops. to improve competitiveness

Redesign
Redesign operations to improve cost and / or increase growth

Innovate
Change the game by innovating across the industry value chain

Connected Machine, Mobility
Visual Factory
Remote Expert
Connected Vehicle

The Internet of Everything – Connect The Unconnected
What do we mean by ‘Smart Solution’?

Cisco Industrial Smart Solutions for Manufacturing

- Validated and documented Smart Business Architecture
- Integrated Cisco and partner solutions and roadmaps
- Comprehensive support and service network
  Lifecycle services with smart capabilities
  Five year product warranty
- ROI tools and financing
Cisco Commitment to Architecture and Product Roadmaps with Smart Solutions

Cisco Industrial Smart Solution Business Benefits:
- Faster decision-making and improved performance: Deliver near-real-time plant performance information across the enterprise to management and control teams worldwide. Enables manufacturers to remotely access production automation systems for faster issue resolution on the plant floor.
- Rapid Network Deployment: Quickly deploy a reliable, secure industrial network with a validated and documented "Cisco Smart Business Architecture".
- Improved Workflows and Innovation: Connect fragmented supply chains. Connect business applications to industrial systems for higher quality and production traceability. Build one common, converged rugged plant-to-business-to-plant network via open, standard industrial IP Ethernet.
- Immediate Access to Systems, Devices, People: View dispersed and disparate systems and devices on one place. In real-time. Collaborate closely, between machines and people, suppliers and customers, design teams and decision makers.

Converged Plantwide Ethernet
A joint Cisco and Rockwell Automation architecture

Cisco Industrial Smart Solution Products: Rugged, Secure, Rable

Site of a Supplier or a Distributor

Manufacturing Headquarters

M38 Gateway/Switch, a small rackable Cisco 4G router with IOS 12.0, 3G - Wi-Fi or LTE wireless WAN.

MS9396T Access Point Radio, secure, outdoor

SCN Gateway, a high-speed, Wi-Fi 802.11 Class I, 64x100 GE, 2x10GE, 2x Gigabit Ethernet, man-made

15000 Compact, secure, modular industrial Ethernet Switch, Wi-Fi 802.11, 2x GbE, 8x 10GE, 1x Gigabit Ethernet, man-made

Cisco 7600 Series Rugged, secure, outdoor

2980 Extender Indoor Access Points, wireless Ethernet up to 10GE, Wi-Fi 802.11, 2x Gigabit Ethernet, man-made

Allen-Bradley, Stratix 8000 and 8000 FastEthernet Industrial Ethernet Switches, EtherCAT, 1000BASE-T, wired Ethernet, man-made

Cisco 7600-SDP line cards For hazardous environments, Wi-Fi 802.11, Gigabit Ethernet, man-made

Cisco 7600-SDP line cards For hazardous environments, Wi-Fi 802.11, Gigabit Ethernet, man-made

Rugged Small Form Factor (sFF) Device: Rugged RS-485 and RS-232 and RS-232 with CANopen interface, man-made

Cisco 7600-SDP line cards For hazardous environments, Wi-Fi 802.11, Gigabit Ethernet, man-made

Cisco 7600-SDP line cards For hazardous environments, Wi-Fi 802.11, Gigabit Ethernet, man-made
**Agility with Efficiency**
- Rapidly shift capacity to accommodate demand shifts or geographic events
- Optimize materials management through product lifecycles
- Decrease risk

**New Business Models**
- Reduce problem resolution and TTM by collaborating with remote, virtual experts with context-rich audio, video and immersive data
- Create new service models with machine-to-machine networks feeding service expert workflows

**Speed with Security**
- Access to detailed production data speeds decision making
- Secure remote access enhances global operations
- Intellectual property and downtime safeguards

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**Connected Manufacturing Smart Solutions Address Business Imperatives**

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**INNOVATE**
The Internet of Everything – Connect The Unconnected
ARC Advisory Group 2013: ‘Information Driven Manufacturing’

ARC Recommendations for Plant Floor

- Prioritize key technologies, fund pilots, and deploy widely
- Ensure core IT infrastructure is in-place and up-to-date
- Seek opportunities to disrupt / transform business process
- Empower the CIO to pursue appropriate technologies
- Drive cultural change to embrace earlier adoption

Figure 2. The 21st Century Reality: There Is a Risk Associated with Too-Low Technology Adoption

Source: ARC Advisory Group 2013
Questions?

Thank You
TOMORROW starts here.