The Connected Enterprise: Make Smart Manufacturing Work for You
Kendall Group Technology Summit

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THE PROBLEM

Is your Digital Transformation program going fast enough and far enough to support your operations and enterprise goals?
Different initiatives, terminology, technologies and products add to the confusion that can prevent firms from moving forward with a Digital Transformation.
THE LACK OF CONNECTIONS

IT/OT Convergence

Business Systems – Transactional

ERP - MRP  FINANCIALS  HR  LOGISTICS  QUALITY  CRM

IT

CONVERGENCE

Vertical Integration

OT

Enterprise Wide

Operations - Real-time

SENSORS, ACTUATORS  CONTROLLERS  MATERIALS & TRANSPORT  MACHINES & EQUIPMENT
Digital Transformation Maturity

STATUS QUO  DISCOVERY  COMMITMENT  EXECUTION  TRANSFORMATION
Digital Transformation Maturity

- **STATUS QUO**
  - Islands of machines, processes, data – the data is not complete
  - Multiple stand-alone systems
  - Decisions to improve performance are delayed

- **DISCOVERY**
  - Beginning to connect equipment
  - More data is digital and available

- **COMMUNICATION**
  - Leadership has requested a business case for an enterprise solution
  - The costs, benefits, and timing have been identified

- **EXECUTION**
  - Business case is approved
  - Key data is digital
  - IT and OT are connected

- **TRANSFORMATION**
  - Culture becomes a data driven for optimizing performance through machine learning and analytics
  - Organization is realizing significant benefits
Building Products Case Study

Lesson: This company didn’t do anything wrong, and it will take a long time to recover
Digital Transformation Journey – Stall Points

- **STATUS QUO**: Key Tactic: Recognize the threat
- **DISCOVERY**: Key Tactic: Experiment with IIoT approaches to improve on a local level
- **COMMITMENT**: Key Tactic: Select partner to support business case
- **EXECUTION**: Key Tactic: Implement digital technology roadmap
- **TRANSFORMATION**: Key Tactic: Create expectations and manage change to become a data optimized culture
We Did It
Rockwell Automation Transformation

**INVENTORY**
120 days to 82 days

**CAPex**
30% in capital avoidance

**LEAD TIMES**
Reduced 50%

**QUALITY**
60% reduction in PPM

**DELIVERY**
82% to 96%

* Productivity gains offset inflation and fund investments

Rockwell Automation Journey Video
Our Connected Facilities

CURRENT MANUFACTURING CELL DEPLOYMENT = 506
6,000 USERS - 6 LANGUAGES
## OT / IT Convergence

Rockwell Automation Manufacturing Execution System

<table>
<thead>
<tr>
<th>ERP SAP</th>
<th>BACK OFFICE EXECUTION</th>
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</thead>
</table>
| - Product Configuration  
- Enterprise Planning  
- Production Scheduling | - Inventory Management  
- Finance |

<table>
<thead>
<tr>
<th>MES ProductionCentre</th>
<th>SHOP FLOOR EXECUTION</th>
</tr>
</thead>
</table>
| - Production Sequencing – Modification/Tuning  
- Work Order Execution/Status  
- Route Execution/Enforcement – Physical Flow  
- Label Printing  
- Machine Status Tracking  
- Yield Management  
- Production Reporting  
- Quality Data Acquisition and Reporting  
- Operator Training and Certification | - “Database of Record” for “Make” Process  
- SPC long-term  
- OEE Reporting  
- Data Collection  
- Work Instructions – Standard and eDWI  
- E-Forms  
- Smart Asset Integration  
- Recipe Management  
- Downtime Tracking |

<table>
<thead>
<tr>
<th>SCADA/ HMI Rockwell RSView</th>
<th>PLANT FLOOR</th>
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</thead>
</table>
| - Machine Visualization  
- Machine Configuration  
- Machine Calibration  
- Batch/Recipe Execution  
- Data Acquisition (including OEE data)  
- Data Logging | - Machine Cycle-time/Run-time  
- Machine Status  
- OEE Data Acquisition  
- Alarm/Events  
- SPC Short-term  
- Trending Short-term |
PRODUCT IMPROVEMENT

Closed Loop, Guided Manufacturing with Integrated Smart Assets
<table>
<thead>
<tr>
<th>Station</th>
<th>Step No</th>
<th>Step Description</th>
<th>Step Type</th>
<th>Identifier</th>
<th>User Name</th>
<th>Result</th>
<th>Additional Data</th>
<th>Complete Time</th>
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<td>F750-</td>
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<td>Secure choke to base with four (4) Duro PT screws</td>
<td>TORQUE</td>
<td>223704-Q14</td>
<td>LOVANG, TIMOTHY</td>
<td>SP1/4-PASS</td>
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<td>Get and place heat sink gasket to base.</td>
<td>ASSE</td>
<td>396601-C02</td>
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<td>P</td>
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<td>11</td>
<td>Obtain heatsink, scan barcode, place in grease fixture (AF) and apply grease (3M533-Q41)</td>
<td>ASSE</td>
<td>378751-C01</td>
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<td>F750-</td>
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<td>Remove heatsink and place into base. Secure heatsink with six (6) Duro PT screws</td>
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PROCESS CAPABILITY

Meaningful Data Driving Meaningful Results
Nozzle Monitor Interactivity

Shows Single “Flyaway” Nozzle That Contributes to 42% of All Rejects
WHY ROCKWELL AUTOMATION?

Complete, Agnostic, Customized Solution
The Connected Enterprise
Customer Outcomes

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

INFORMATION SOLUTIONS CAPABILITIES – Cloud | On-Premise | Edge

SCALABLE EXECUTION SYSTEMS  SCALABLE ANALYTICS  MOBILITY & COLLABORATION  CONNECTED SERVICES

ROCKWELL AUTOMATION IIoT INFRASTRUCTURE – Integrated Architecture™

SMART CONNECTED ASSETS – Ethernet/IP Enabled Network

SENSORS & ACTUATORS  INTELLIGENT MOTOR CONTROL  CONTROLLERS  MOBILE / DISPLAYS  MACHINES & EQUIPMENT  REMOTE ASSETS
Customized Solution
Schedule a Discovery workshop and a visit to a Rockwell Automation facility to help you determine where you are on the digital transformation journey.
Thank you!