Real-time Visibility for SAP in Manufacturing Operations:  
Cost Savings from Real-World Deployments

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• Real-time Visibility = Real Cost Savings for Manufacturers
• Where visibility adds the most value in SAP solutions
• How SAP and OAT work together for a complete solution
• SAP-OAT Platform
• Walk Through Specific Manufacturing Use Cases and Process Flows
• How to get started
Real-time Visibility

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Figure: SAP Supply Chain Management Solution Map
Where Real-time Visibility Reduces Costs

Real-time Enabling Reduces:
- Labor Costs
- On-hand Inventory
- Scrap
- Rework
- Make Goods
### Real-time Enabling Manufacturing Process Areas

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<th>Supply Chain</th>
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<tr>
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<tr>
<td>- Batch Number</td>
<td>- Order Contents</td>
<td>- Test Results</td>
<td>- Part Expiration Date</td>
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<tr>
<td>- Due Date</td>
<td>- Final Destination</td>
<td>- Custom Order Details</td>
<td>- Service Due Date</td>
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<td><strong>Processes to Enable:</strong></td>
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<tr>
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<td>- Shipping/Receiving Yard Management Transportation</td>
<td>- Shipping/Receiving Line-side Replenishment Assembly Asset Tracking Tool Tracking</td>
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<td>- Shipping/Receiving Yard Management Transportation</td>
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<td><strong>Enterprise Systems to Enable</strong></td>
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<td>ERP MMS WMS</td>
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<td>Field Service Enterprise Asset Management</td>
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<tr>
<td><strong>Infrastructure to Enable</strong></td>
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<tr>
<td>Barcode, RFID, CMBs, Wi-Fi</td>
<td>Barcode, RFID, Wi-Fi, RTLS, GPS</td>
<td>Barcode, RFID, CMBs, Wi-Fi, PLCs, Stack Lights &amp; other sensors</td>
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<td><strong>Quantifying Value:</strong></td>
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<tr>
<td>Increased Forecast Accuracy</td>
<td>Streamlined Shipping Costs</td>
<td>Improved Product Quality, Fewer Returns</td>
<td>Increased Time in Service</td>
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<tr>
<td>Reduced Safety Stock</td>
<td>Increased Order Accuracy</td>
<td>Reduced Downtime</td>
<td>Fewer Audits &amp; Regulatory Fines</td>
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<td>Reduced Expedite Costs</td>
<td>&amp; Customer Satisfaction</td>
<td>Reduced Scrap &amp; Rework</td>
<td>Reduced Maintenance and Repair Costs</td>
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<td></td>
<td>Reduced Expedite Costs</td>
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</table>
| Enterprise Resource Planning (ERP) Systems | • Verify physical components against bill of materials  
|                                           | • Trigger inventory replenishment when low stock is detected |
| Manufacturing Execution Systems (MES)    | • Track physical products at each stage of testing & assembly  
|                                           | • Confirm that custom orders match manifest  
|                                           | • Locate missing parts & equipment |
| Warehouse Management Systems (WMS)       | • Verify manifest & destination for outgoing shipments  
|                                           | • Prevent mis-shipments with visual/audible alarms  
|                                           | • Track finished goods inventory |
| Business Activity Monitoring (BAM) Dashboards | • Automatically update dashboards to reflect:  
|                                           | − Physical inventory levels  
|                                           | − Orders shipped  
|                                           | − Manufacturing efficiency |

“Each product requires over 50 barcode scans during assembly. Each scan takes 12 seconds. Add up the labor and you’re saving 10 minutes of assembly from each unit with Auto-ID technology”

– Construction & Mining Equipment Manufacturer
# OAT-SAP Customer Examples

<table>
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<tr>
<th>Industry:</th>
<th>Cost / Benefit from Real-time Visibility:</th>
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</table>
| Agriculture | • Significantly reduced scrap product by tracking batch #s and expiration dates  
 |  | • Reduced on-hand inventory with auto-replenishment, while improving customer satisfaction |
| Aerospace | • Reduced on-hand inventory with RFID-enabled Kanban  
 |  | • Reduced tool stores  
 |  | • Eliminate assumed receipts in logistics |
| Consumer Electronics | • Reduced on-hand inventory and rework costs |
| Pharmaceuticals | • Track movement of controlled substances in secured facilities |
| Industrial Equipment | • Reduced expedite and labor costs |
| Consumer Goods | • Increased sales of in-store promotions through on-time execution |
Real-time Visibility for a Discrete Manufacturer

Dan Ahearn, OATSystems
Real-time Visibility Benefits

Strategic Benefits:

• Real time visibility and automatic update of events across the value chain
• Unprecedented high level of information accuracy
• Move to a digital ‘fly by wire’ supply chain

Process Benefits:

• More efficient automated processes → shorter cycle times → less inventory
• Increased accuracy & control of business operations → less non conformities
• Increased traceability of part life cycle → less paper, less time → lower costs
• More automation → Less manual intervention → Improved labour productivity

Business Benefits:

• Business Benefits
• Reduction in Inventory & Capital Assets
• Increased Labour Productivity and better avoidance of Costs
An RFID-enabled Supply Chain Process

1. **Tag Parts & Validate Shipment**

2. **Transmit ASN**

3. **Track Shipments Entering the Warehouse**

4. **Track Shipment Movement from Receiving to Inventory**

5a. **Track Parts Containers to Assembly Area**

**RFID Readers** (Identification Checkpoints): Can be deployed using RFID portals or Mobile RFID Solution
An RFID-enabled Supply Chain Process

1. Tag Parts & Validate Shipment
   - Parts Supplier
   - Transmit ASN

2. Advance Shipping Notice
   - Transmit ASN

3. Track Shipments Entering the Warehouse

4. Track Movement from Receiving to Inventory
   - Parts Warehouse/Inventory

5a. Track Parts Containers to Assembly Area
   - Upper Deck, Lower Deck, Floor Deck

5b. Alert if parts container is delivered to the wrong place

- Alert if the wrong shipment is delivered or if shipment contains wrong parts

RFID Readers (Identification Checkpoints): Can be deployed using RFID portals or Mobile RFID Solution
An RFID-enabled Supply Chain Process

1. Tag Parts & Validate Shipment
2. Transmit ASN
3. Track Shipments Entering the Warehouse
4. Furnishing Hangar
5a. Track Parts Containers to Assembly Area
5b. Alert if parts container is delivered to the wrong place

- Parts Warehouse/Inventory
- Elevator/Lift
- Upper Deck
- Lower Deck
- Floor Deck
- Assembly/Factory Floor
- SAP ERP
- Receiving

KPI Analysis
- Parts Warehouse/Inventory

Alert if the wrong shipment is delivered or if shipment contains wrong parts
Real-time Visibility
Packaged Solutions

Dan Ahearn, OATSystems
Stephen Cloughley, SAP
Why Real-time Visibility? Why Packaged Solutions?

• Real-time Visibility
  – Enhance the value of SAP Applications to cut inventory, labor and operations costs
  – Discuss strategic issues and interdependencies that impact enterprise efficiencies
  – Enterprise workflows; integrated solution

• Packaged Solutions
  – Proven solutions at multiple customer sites
  – Rapid deployment
    • Out-of-the-box solutions for tool tracking, RTI tracking, Kanban, etc.
  – Enterprise scale
  – SAP-certified
**SAP Auto-ID Solution Landscape**

- **Tags, CMBs**: Auto-ID Readers, RTLS, Wi-Fi, GPS
- **Sensors**: Auto-ID Readers, RTLS, Wi-Fi, GPS
- **Sensor Management**: Manage multiple readers, Cleanse data, Operator workflow
- **“Edge” execution**: Translate raw data to business execution
- **SAP Process Integration**: Enrich core functions with Auto-ID data
- **Enterprise Applications**: Decision support and execute transactions

**Function**
- Read / write / transmit data to systems
- Manage multiple readers
- Cleanse data
- Operator workflow
- Translate raw data to business execution
- Enrich core functions with Auto-ID data
- Decision support and execute transactions

**Delivery**
- Physics/Device expertise
- Partner
- System Integration Services: Value generation with RFID
- Partner

Legend:
- = Partner Offering
- = OAT Offering
- = SAP Offering
Real-time Visibility: Real-World Scenarios

Stephen Cloughley
Senior Director
SAP Labs LLC
Manufacturing Supply Chain
Manufacturing Process Areas

1. Receiving
2. Component Inventory
3. Assembly Line/Manufacturing
4. Final Assembly Completion
5. Finished Goods Warehouse
6. Shipping Dock
7. Trailer Yard

Inbound Receiving: RTI Tracking
Work-in-Process Tracking
Yard Tracking
Manufacturing Process Areas:
Inbound Receiving / RTI Tracking
Inbound Receiving / RTI Tracking
Sample Process Flow

- Validating order & manifest details against physical containers and their contents
Inbound Receiving: Value Proposition

- Reduce Discrepancy Handling Costs
  - Proof of delivery process (RTI based)
  - RTI differences based on Serial Shipping Container Code (SSCC)
  - Additional information provided through Global Returnable Asset Identifier (GRAI) visibility

- Improve Business Processes between trading partners
  - Improved receiving process, does not require manual counting
  - Automatic RTI management, reducing administrative responsibilities
  - Improved billing processes

- Improve Supply Chain Metrics
  - Improve cycle time
  - Appropriate inventory levels
  - Reduction in out-of-stock

- Reduce Costs
  - Reduce Mis-shipments, Rework and SafetyStock
  - Reduce Container Replacement Cost and Spares
  - Reuse tags, leverage barcoding
Work-in-Process Tracking:
Sample Process Flow

- Verifying Components as they are Assigned to Work Orders

**Sample: Process Flow**

- Get Work Order details from ERP / MES
- Assign work order to operator
- Execute ERP transactions (update component inventory, work order status) & capture event data to OER

**SAP ERP™ / SAP MES™ & SAP OER™**

- Get assembly instructions & component list for workstation #3
- Validate against work order
- Send work order status to All

**SAP All™**

- Receipt workstation #3
- Read component serial #s, batch #s, test data
- Operator feedback

**OATxpress™**

Alert! Part # TR783-065 recalled. Please substitute Part # CR782-0621

**OATdevice manager™**
Work-in-Process Tracking: Process Improvements

- Reduced labor costs for tracking materials and equipment during the assembly process
- Well-documented audit trail, improved warranty service
- Reduction in asset shrinkage
- Improved product quality, leading to better customer service
Manufacturing Process Area: Yard Tracking

1. Receiving
2. Component Inventory
3. Assembly Line/Manufacturing
4. Final Assembly Completion
5. Finished Goods Warehouse
6. Shipping Dock
7. Trailer Yard

Yard Tracking
Yard Tracking: Sample Process Flow

Sample Process Flow
- Verifying Finished Goods Location and Maintenance during Check-In – Check-Out Process

Pinpoint goods location in yard
Yard Tracking: Process Improvements

- Significantly reduced error rates and costly correction processes
- Reduced expedite costs and safety stock to cover lost shipments
- Reduced labor costs for tracking down missing assets and managing administrative paperwork
- Reduction in asset shrinkage
- Improved shipping estimates, leading to better customer service
Next Steps: How to Get Started

Dan Ahearn, OATSystems
Next Steps

• Evaluate Key Process Areas
  – Closed-loop
  – Labor-intensive
  – Customer facing

• Articulate Value
  – Labor savings
  – Reduced inventory
  – Shipping costs/logistics