

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

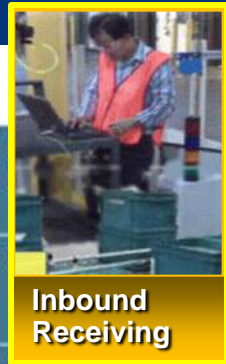
Real-time Visibility



Demand & Supply Planning	Demand Planning & Forecasting	Safety Stock Planning	Supply Network Planning	Distribution Planning	Service Parts Planning
Procurement	Strategic Sourcing		Purchase Order Processing		Invoicing
Manufacturing	Production Planning & Detailed Scheduling		Manufacturing Visibility & Execution & Collaboration		MRP-Based Detailed Scheduling
Warehousing	Inbound Processing & Receipt Confirmation	Outbound Processing	Cross Docking	Warehousing & Storage	Physical Inventory
Order Fulfillment	Sales Order Processing		Billing		Service Parts Order Fulfillment
Transportation	Freight Management	Planning & Dispatching	Rating & Billing & Settlement	Driver & Asset Management	Network Collaboration
Real World Awareness	Supply Chain Event Management			Auto ID/RFID and Sensor Integration	
Supply Chain Visibility	Strategic Supply Chain Design	Supply Chain Analytics		Supply Chain Risk Management	Sales & Operations Planning
Supply Network Collaboration	Supplier Collaboration		Customer Collaboration		Outsourced Manufacturing
Supply Chain Management with Duet™	Demand Planning in MS Excel				

Figure: SAP® Supply Chain Management Solution Map

Where Real-time Visibility Reduces Costs



Inbound Receiving



Yard Management



Work-in-Process Tracking



Quality Audit



Cycle Counting



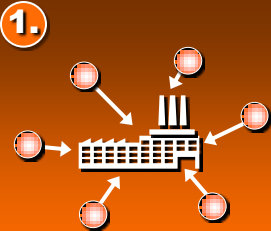
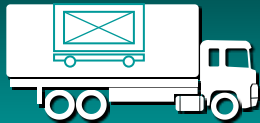
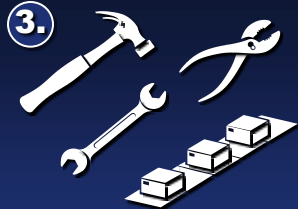

Directed Putaway



- Real-time Enabling Reduces:**
- Labor Costs
 - On-hand Inventory
 - Scrap
 - Rework
 - Make Goods

Figure: SAP® Supply Chain Management Solution Map

Real-time Enabling Manufacturing Process Areas

	 <p>1. Supply Chain</p>	 <p>2. Logistics & Distribution</p>	 <p>3. Manufacturing / Assembly Lines</p>	 <p>4. Maintenance & Reverse Logistics</p>
Items to Track:	<ul style="list-style-type: none"> • Component Parts • Supplier • Batch Number • Due Date 	<ul style="list-style-type: none"> • Carrier • Order Number • Order Contents • Final Destination • Due Date 	<ul style="list-style-type: none"> • Work-in-Process • Tools and Equipment • Test Results • Custom Order Details 	<ul style="list-style-type: none"> • Service History • Replacement Parts • Part Expiration Date • Service Due Date
Processes to Enable:	Sourcing Shipping/Receiving	Shipping/Receiving Yard Management Transportation	Shipping/Receiving Line-side Replenishment Assembly Asset Tracking Tool Tracking	Line-side Maintenance Reverse Logistics
Enterprise Systems to Enable	ERP MMS WMS	ERP WMS	ERP MMS MES WMS	Field Service Enterprise Asset Management
Infrastructure to Enable	Barcode, RFID, CMBs, Wi-Fi	Barcode, RFID, Wi-Fi, RTLS, GPS	Barcode, RFID, CMBs, Wi-Fi, PLCs, Stack Lights & other sensors	Barcode, RFID, CMBs, Wi-Fi, RTLS, GPS
Quantifying Value:	Increased Forecast Accuracy Reduced Safety Stock Reduced Expedite Costs	Streamlined Shipping Costs Increased Order Accuracy & Customer Satisfaction	Improved Product Quality, Fewer Returns Reduced Downtime Reduced Scrap & Rework Reduced Expedite Costs	Increased Time in Service Fewer Audits & Regulatory Fines Reduced Maintenance and Repair Costs



Real-time Enabling Manufacturing Systems Auto-ID Integration Examples

Enterprise Resource Planning (ERP) Systems	<ul style="list-style-type: none"> • Verify physical components against bill of materials • Trigger inventory replenishment when low stock is detected
Manufacturing Execution Systems (MES)	<ul style="list-style-type: none"> • Track physical products at each stage of testing & assembly • Confirm that custom orders match manifest • Locate missing parts & equipment
Warehouse Management Systems (WMS)	<ul style="list-style-type: none"> • Verify manifest & destination for outgoing shipments • Prevent mis-shipments with visual/audible alarms • Track finished goods inventory
Business Activity Monitoring (BAM) Dashboards	<ul style="list-style-type: none"> • Automatically update dashboards to reflect: <ul style="list-style-type: none"> – 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

Industry:	Cost / Benefit from Real-time Visibility:
Agriculture	<ul style="list-style-type: none">• Significantly reduced scrap product by tracking batch #s and expiration dates• Reduced on-hand inventory with auto-replenishment, while improving customer satisfaction
Aerospace	<ul style="list-style-type: none">• Reduced on-hand inventory with RFID-enabled Kanban• Reduced tool stores• Eliminate assumed receipts in logistics
Consumer Electronics	<ul style="list-style-type: none">• Reduced on-hand inventory and rework costs
Pharmaceuticals	<ul style="list-style-type: none">• Track movement of controlled substances in secured facilities
Industrial Equipment	<ul style="list-style-type: none">• Reduced expedite and labor costs
Consumer Goods	<ul style="list-style-type: none">• Increased sales of in-store promotions through on-time execution

Real-time Visibility for a Discrete Manufacturer

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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:

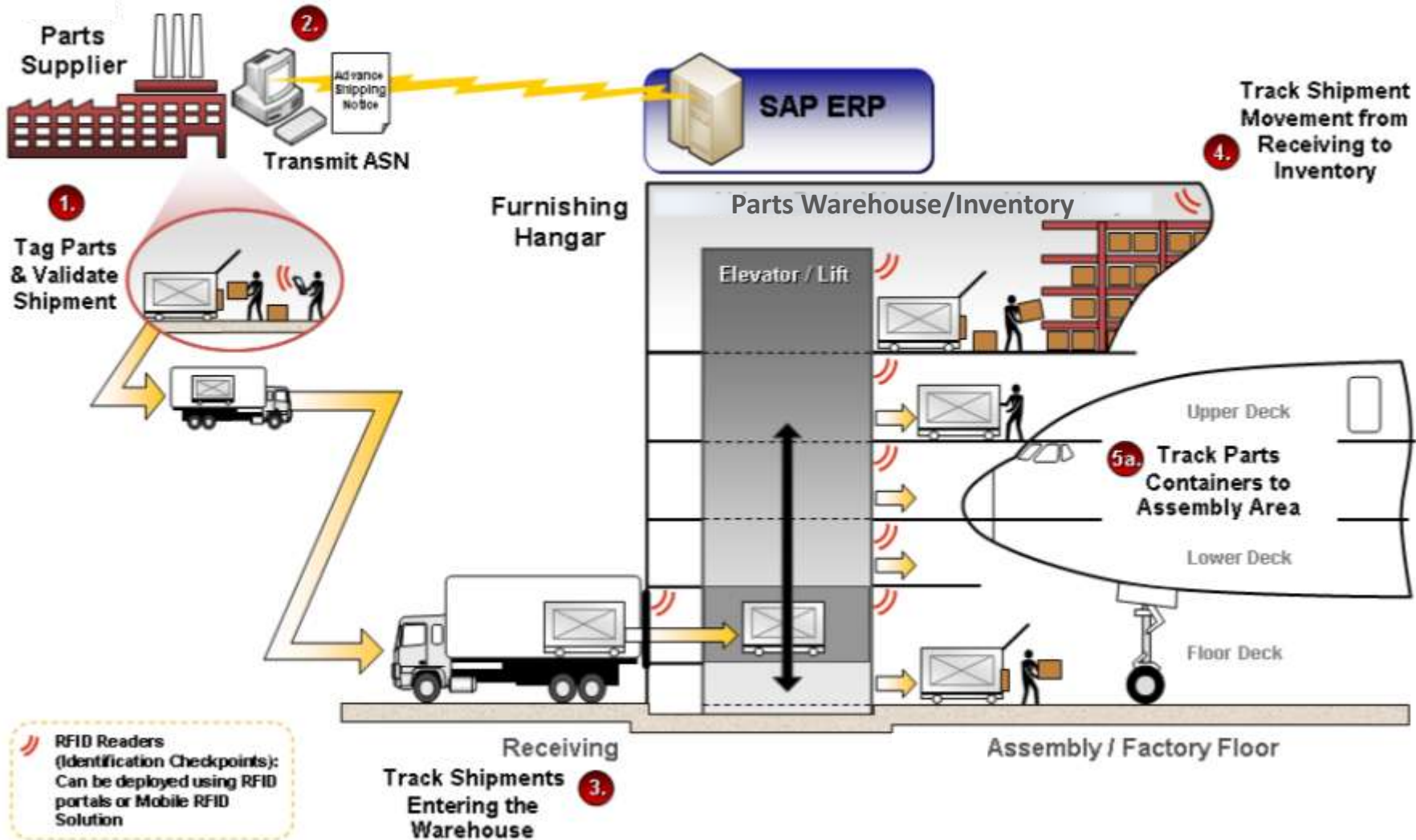
- More efficient automated processes → shorter cycle times → less inventory
- Increased accuracy & control of business operations → less non conformities
- Increased traceability of part life cycle → less paper, less time → lower costs
- More automation → Less manual intervention → Improved labour productivity

Business Benefits:

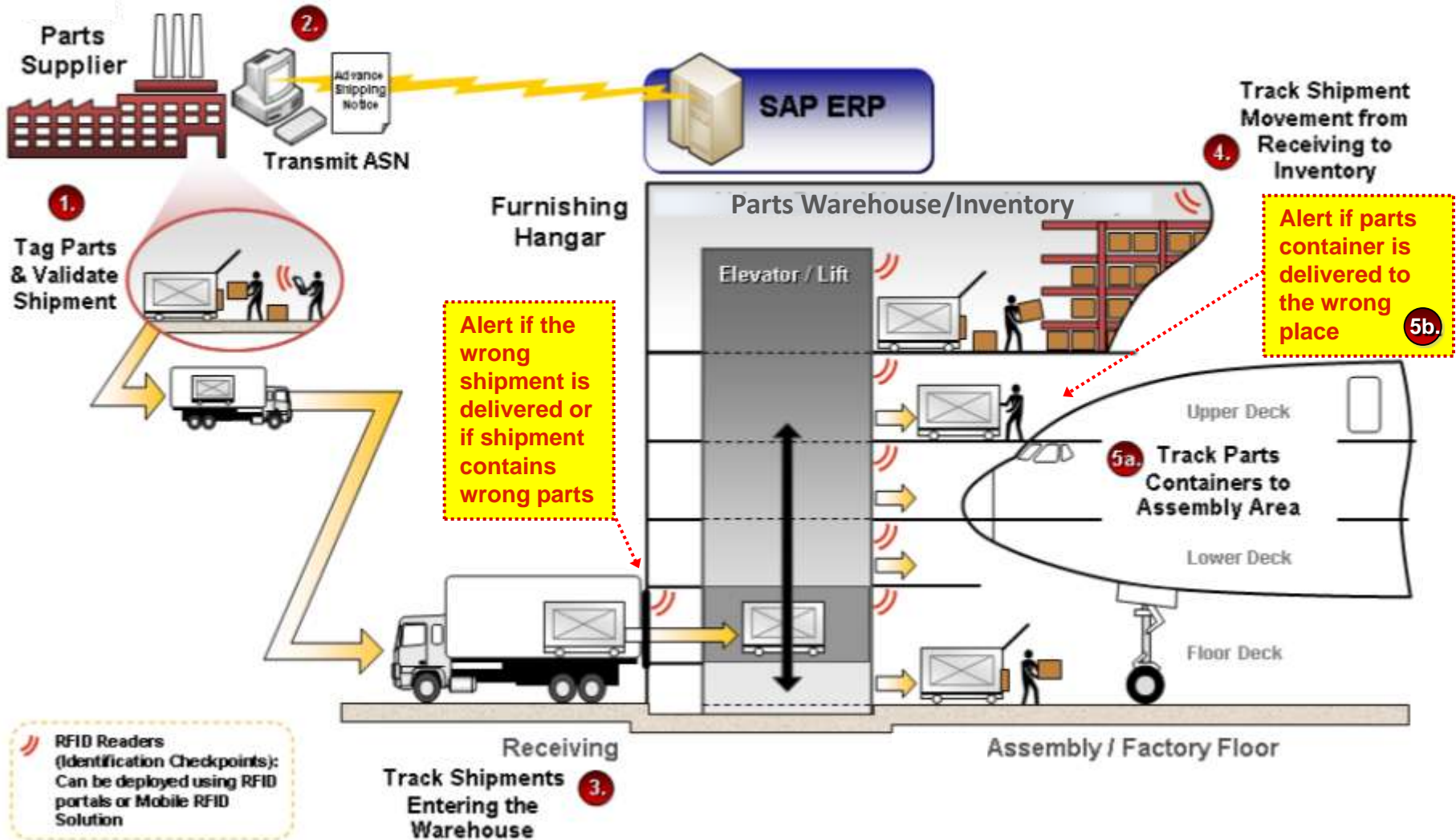
- Business Benefits
- Reduction in Inventory & Capital Assets
- Increased Labour Productivity and better avoidance of Costs



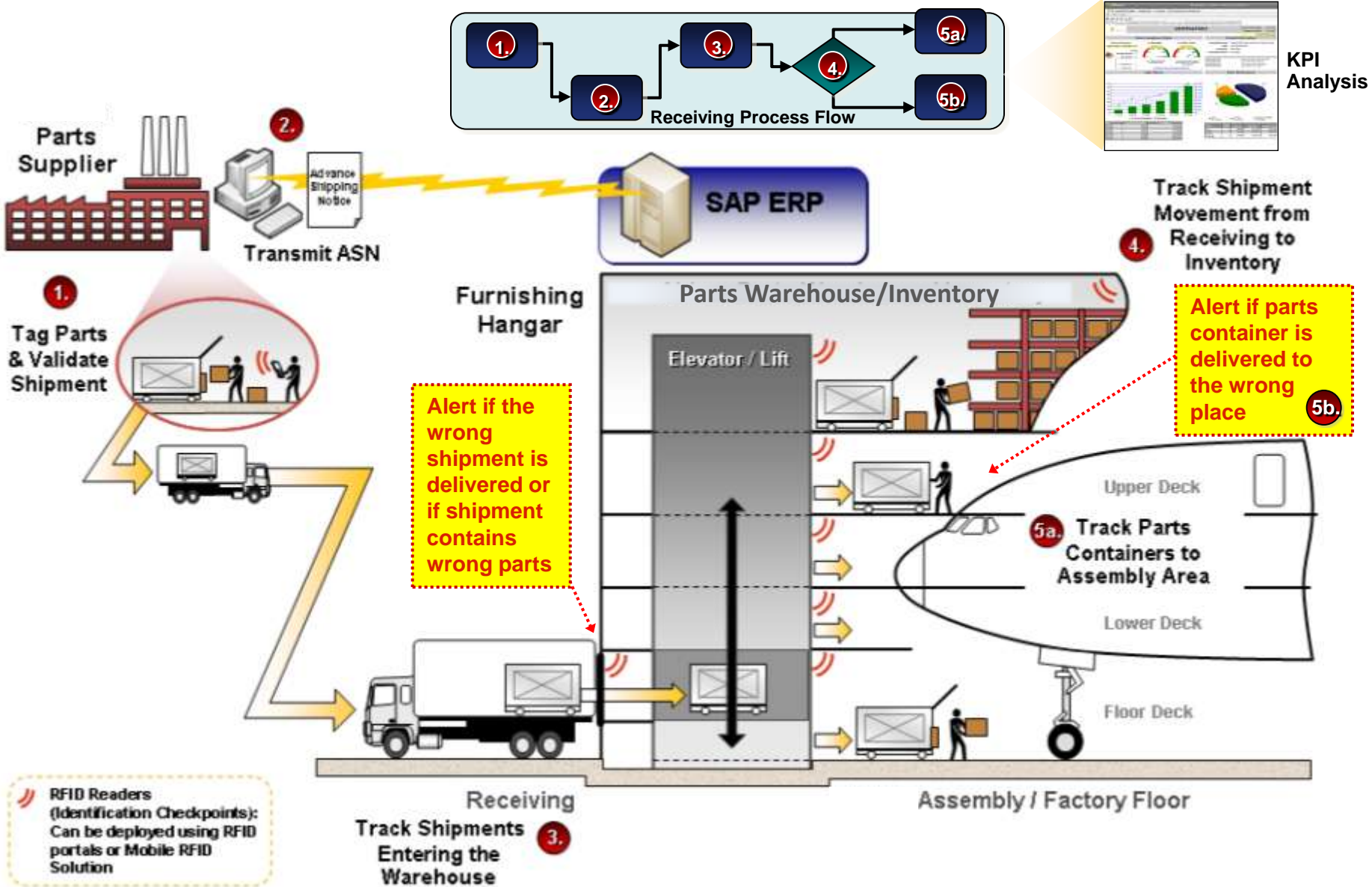
An RFID-enabled Supply Chain Process



An RFID-enabled Supply Chain Process



An RFID-enabled Supply Chain Process



Real-time Visibility Packaged Solutions

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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

RTI Tracking



Receiving



Line-side Replenishment

Cycle Counting



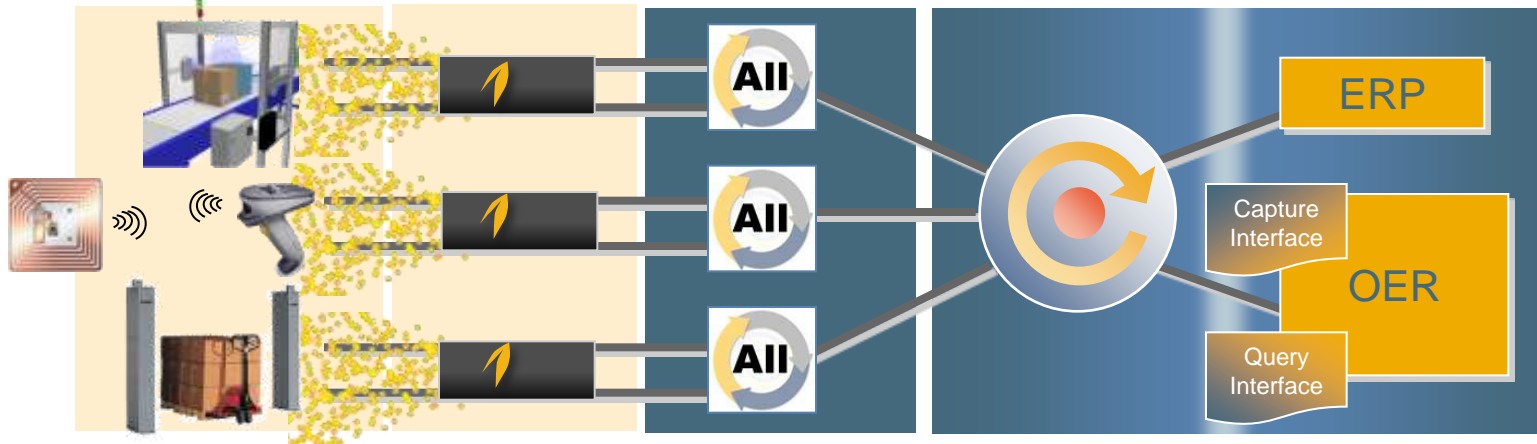
Yard Management



SAP Auto-ID Solution Landscape



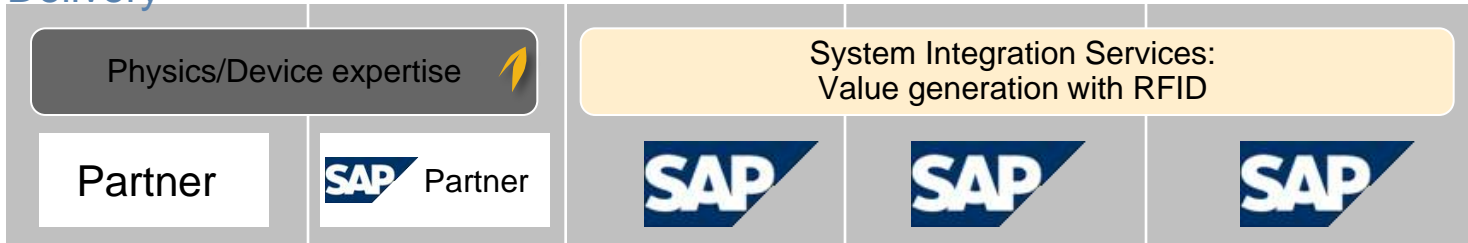
Tags, CMBs Sensors: Auto-ID Readers, RTLS, Wi-Fi, GPS Sensor Management “Edge” execution SAP Process Integration Enterprise Applications



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
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Delivery



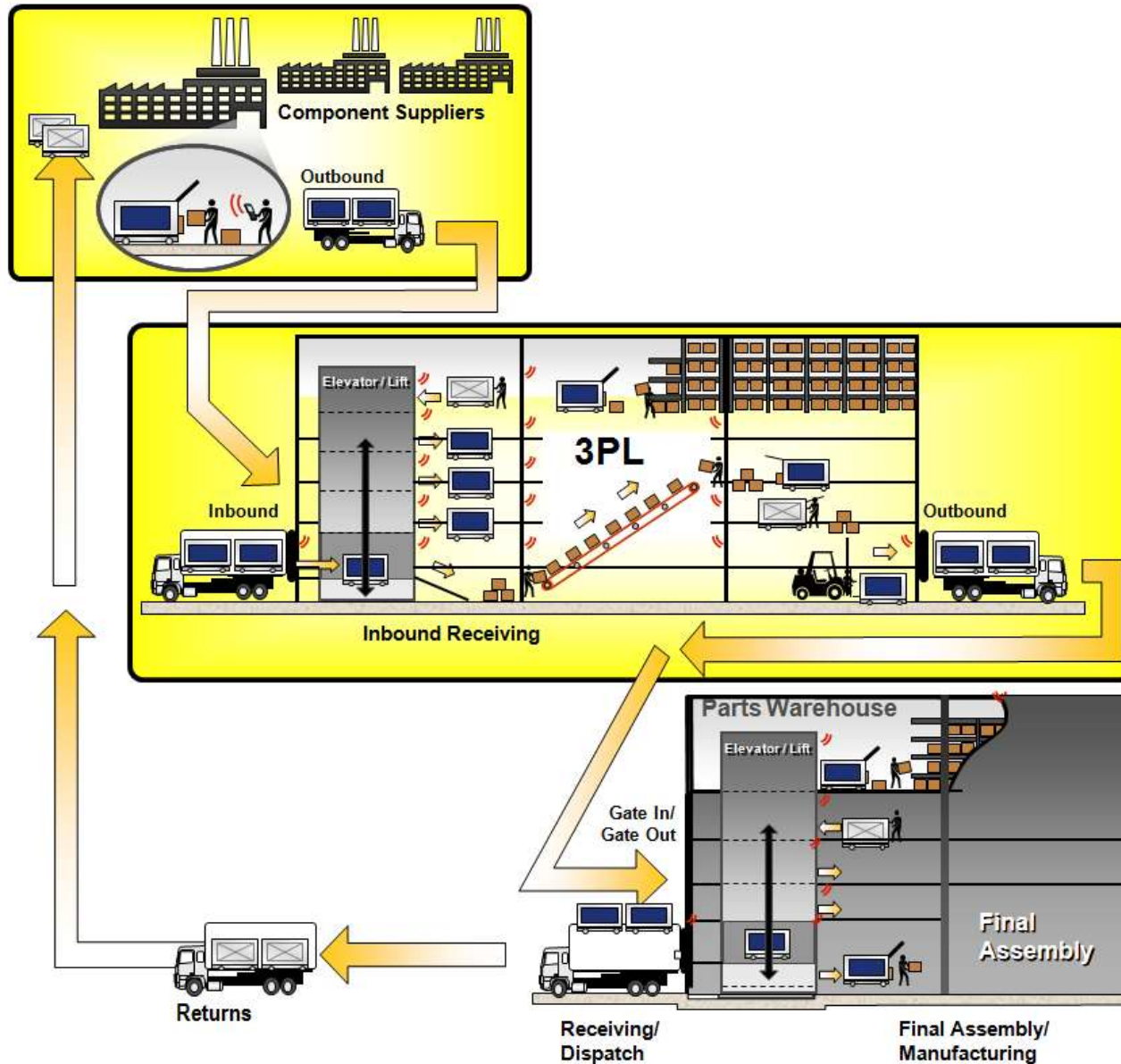
= Partner Offering
 ⚡ = OAT Offering
 SAP = SAP Offering

Real-time Visibility: Real-World Scenarios

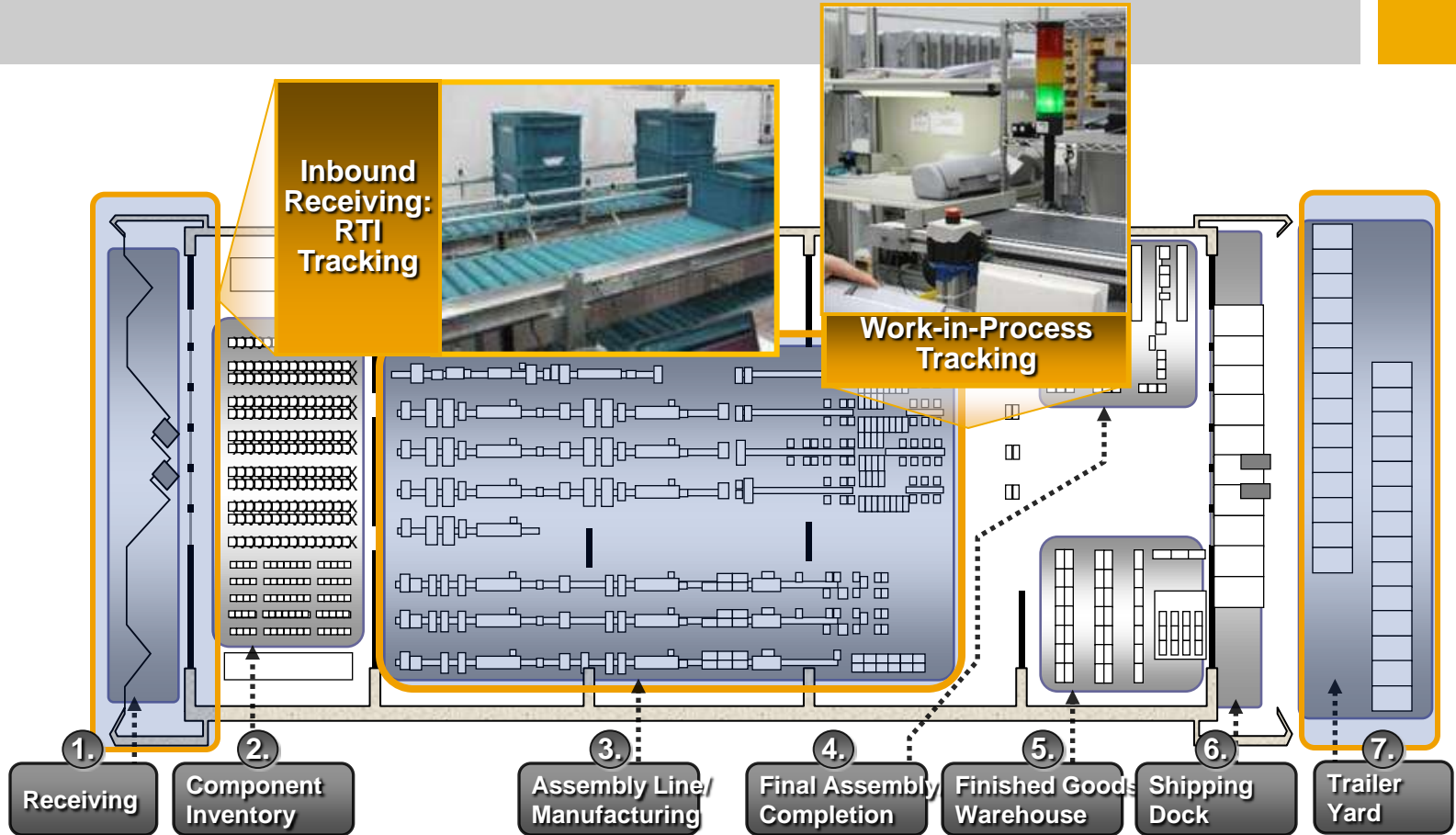
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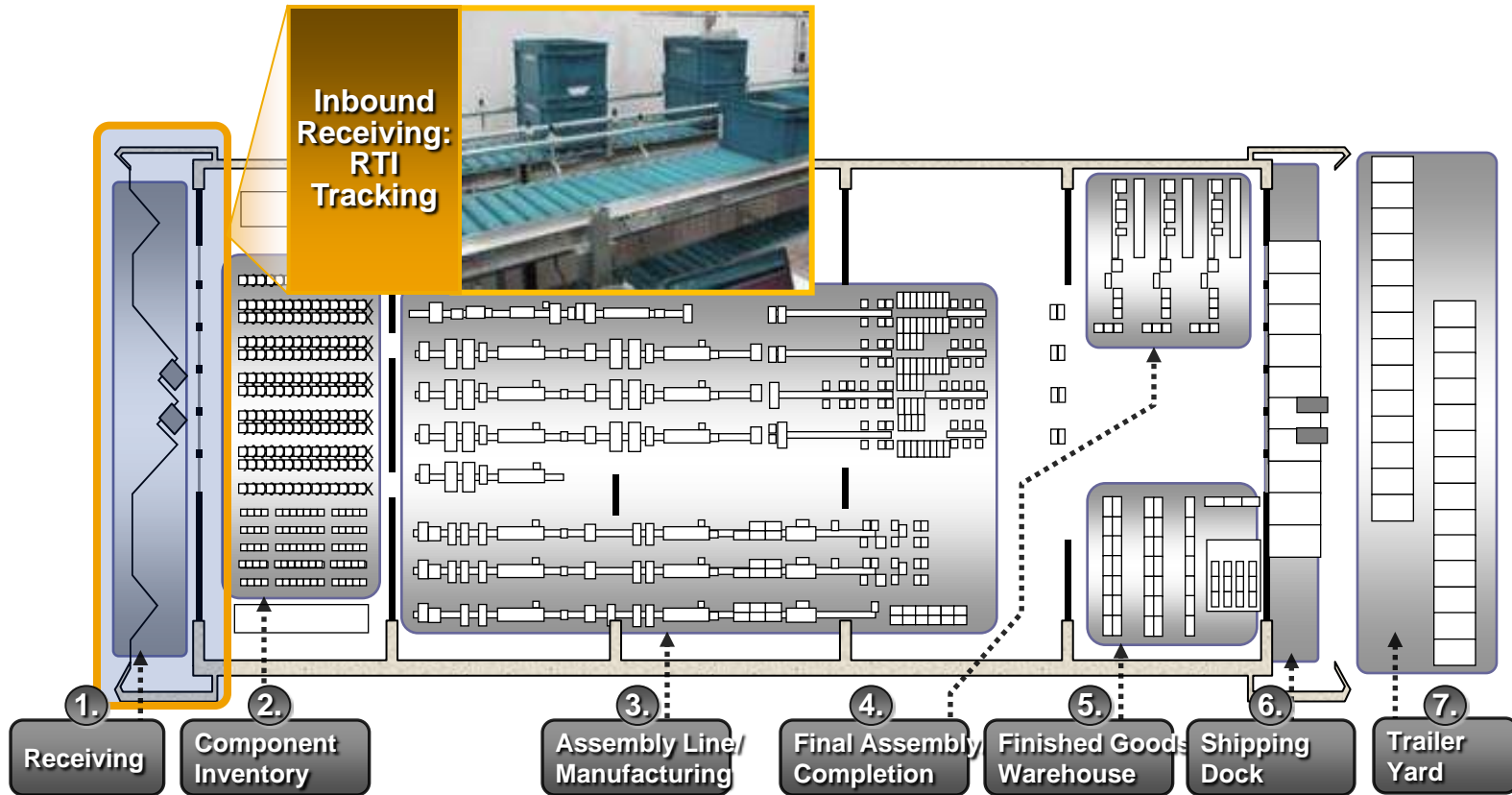
Manufacturing Supply Chain



Manufacturing Process Areas



Manufacturing Process Areas: Inbound Receiving / RTI Tracking

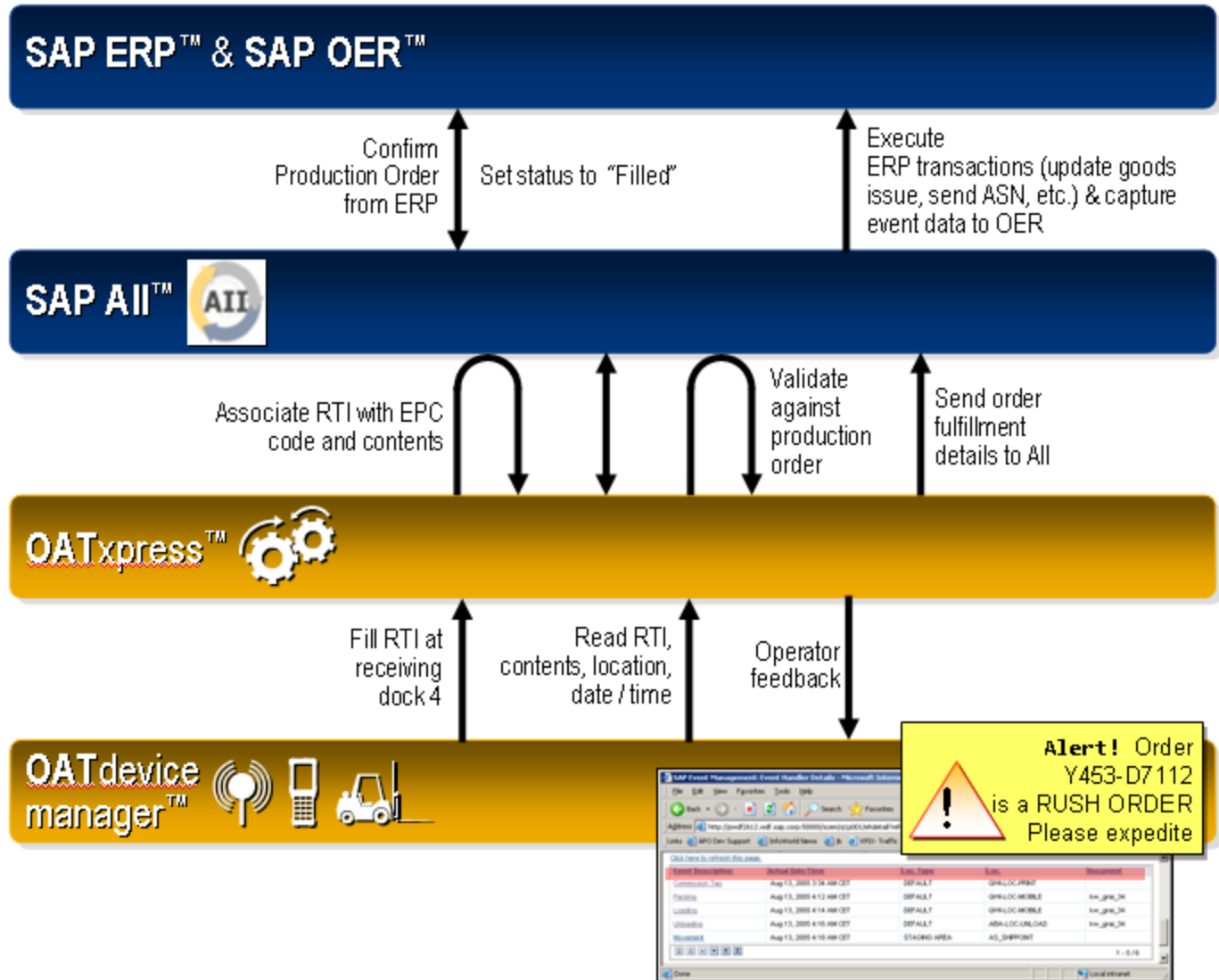


Inbound Receiving / RTI Tracking Sample Process Flow



Sample: Process Flow

- Validating order & manifest details against physical containers and their contents



- **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

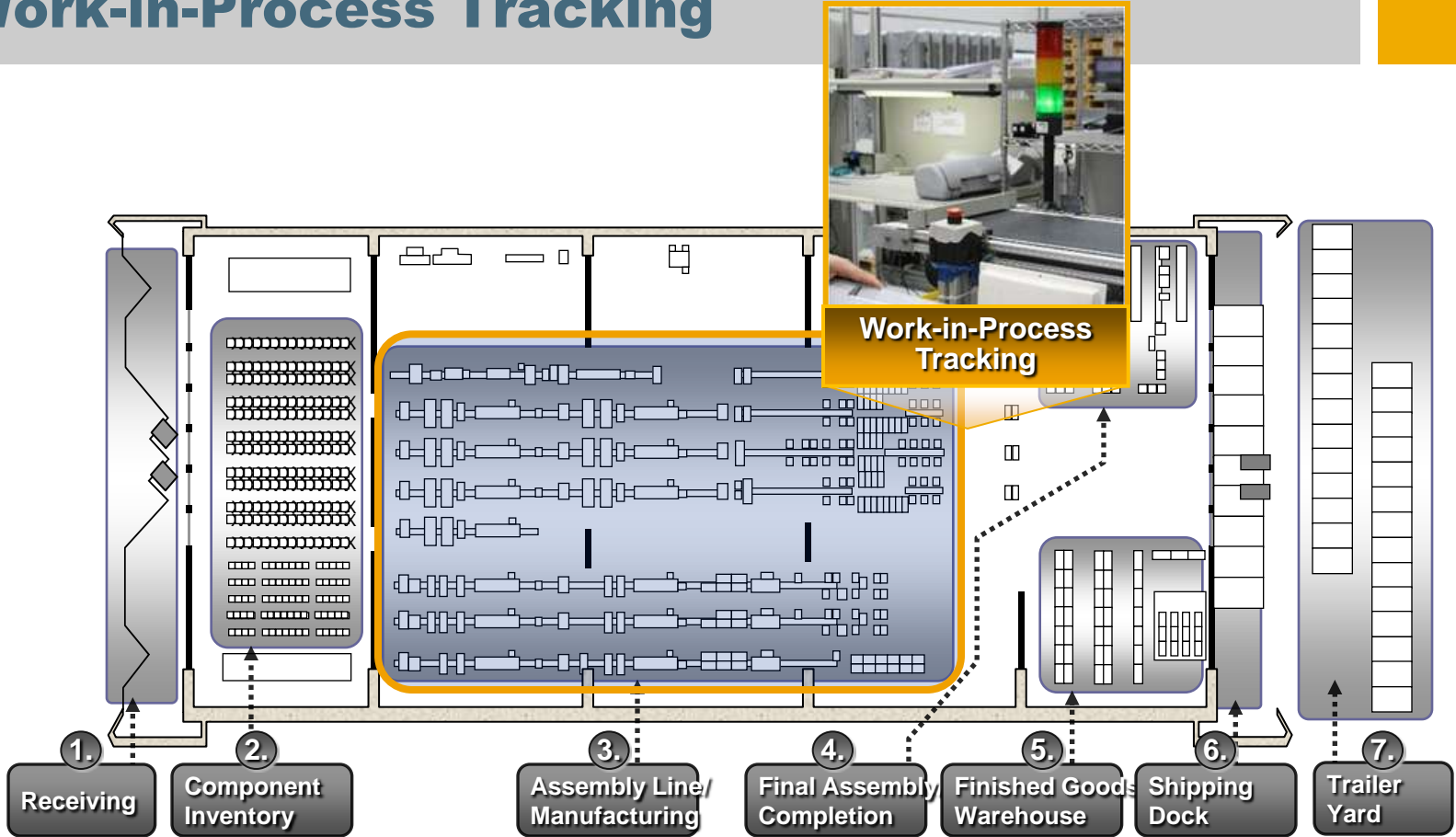
- **Improve Business Processes between trading partners**
 - Improved receiving process, does not require manual counting
 - Automatic RTI management, reducing administrative responsibilities
 - Improved billing processes

- **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



Manufacturing Process Area: Work-in-Process Tracking

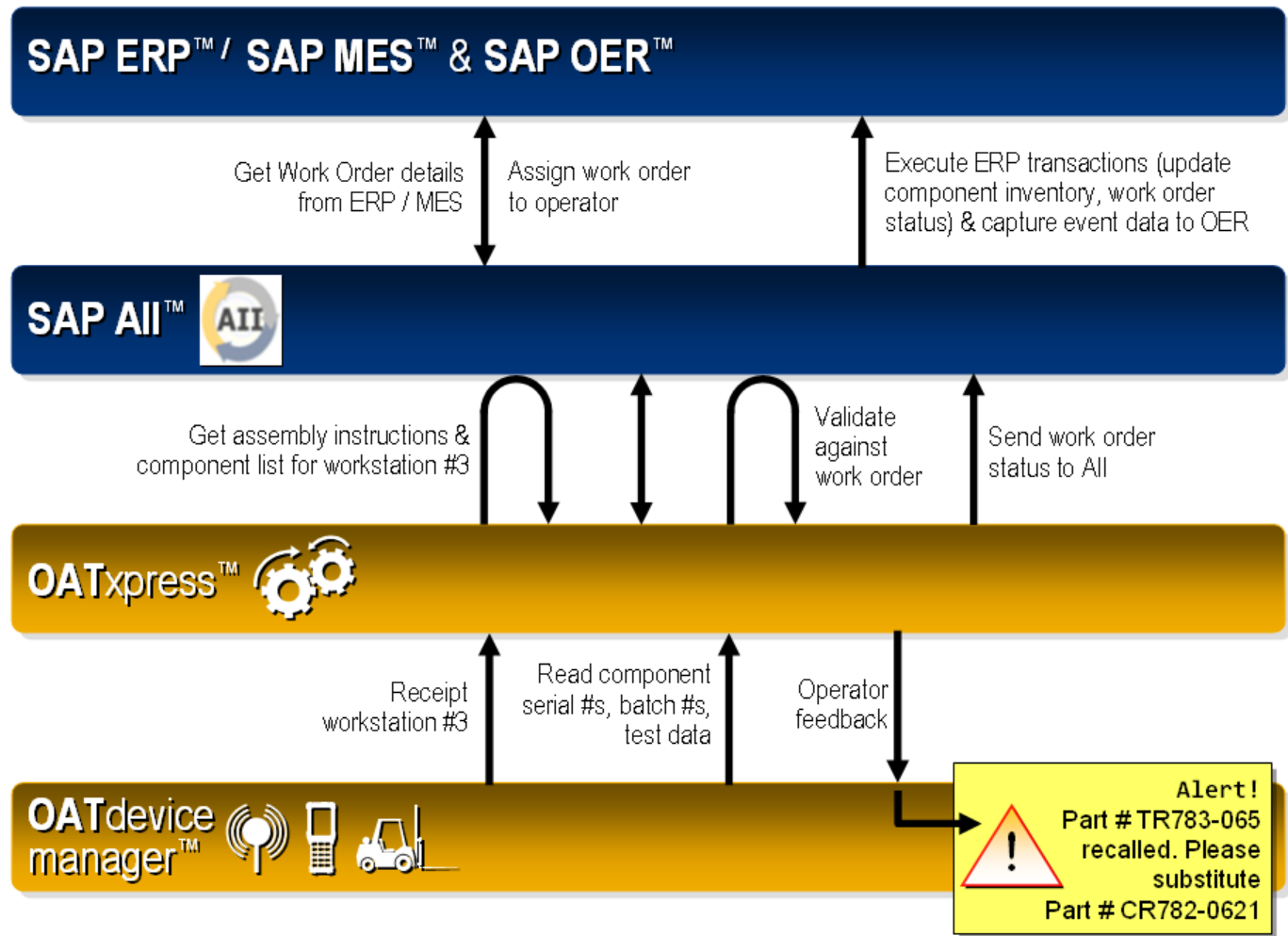


Work-in-Process Tracking: Sample Process Flow



Sample: Process Flow

- Verifying Components as they are Assigned to Work Orders

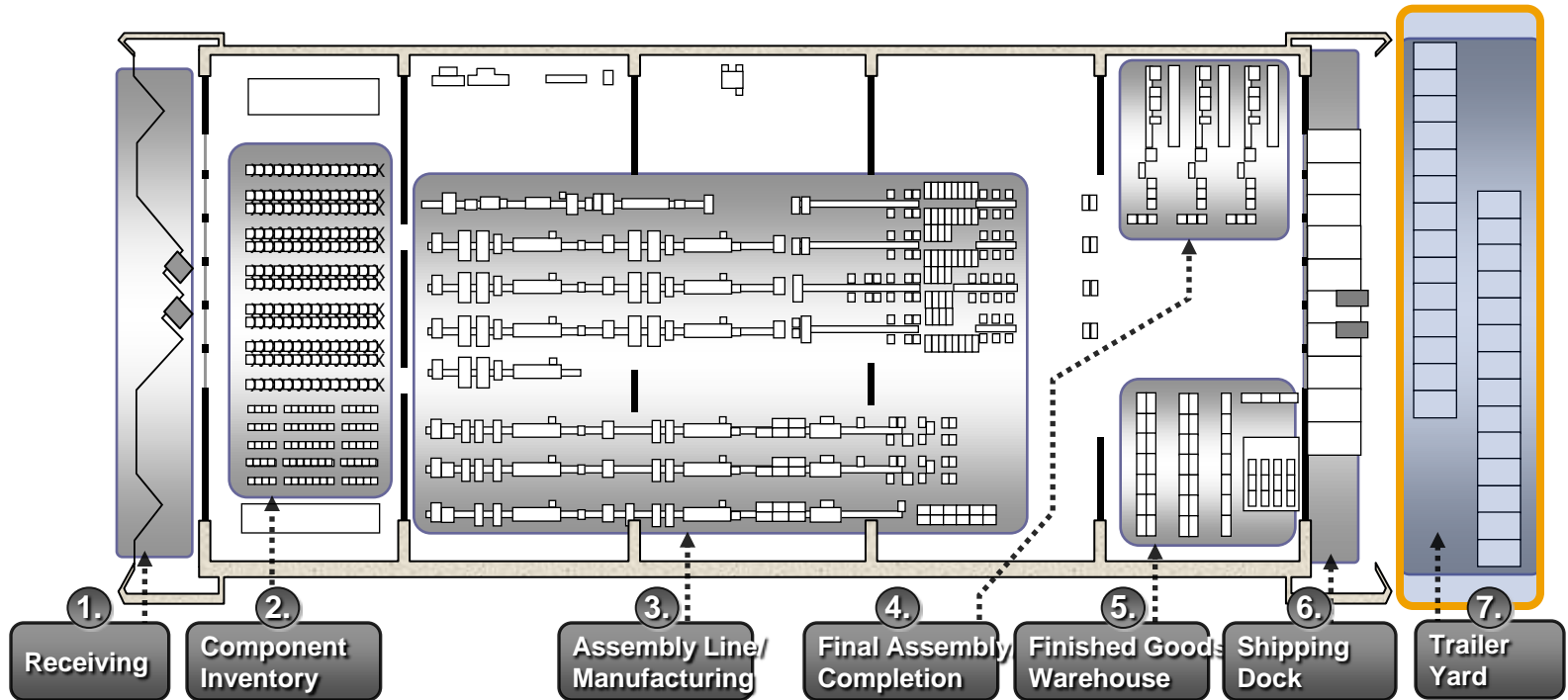


Work-in-Process Tracking: Process Improvements

- 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

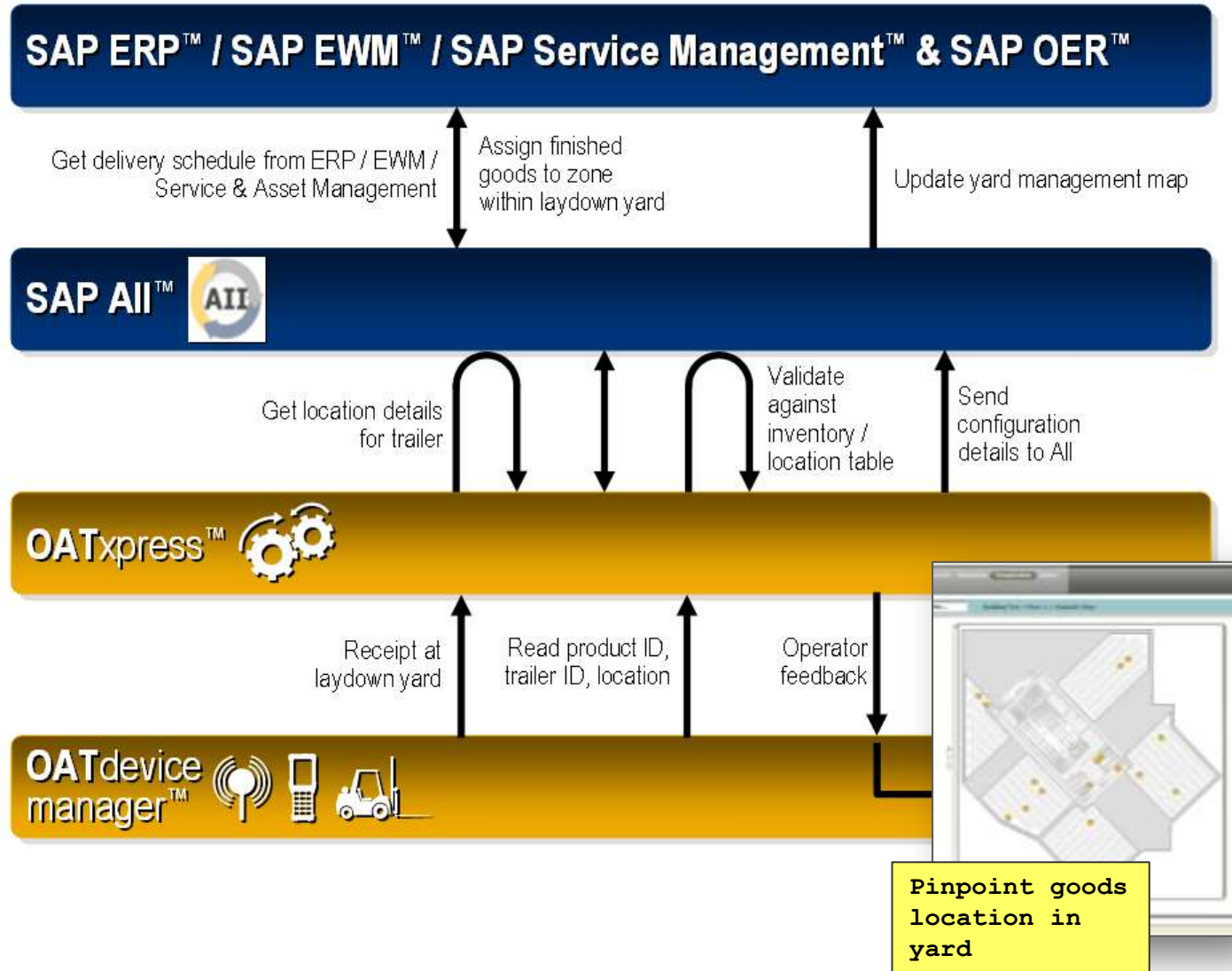


Yard Tracking: Sample Process Flow



Sample: Process Flow

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



Yard Tracking: Process Improvements

SAP

- 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

The screenshot displays the SAP Supply Chain Event Management (SCEM) interface. The top section shows 'Customer's Delivery Details' for Customer 1400, with a delivery number 8000504 and a status of 'On Time'. Below this is a table of events:

Status	Event	Planned Date/Time	Actual Date/Time
●	Picking Begin	May 29, 2003 7:00 AM	May 29, 2003 7:00
●	Picking End	May 29, 2003 9:00 AM	May 29, 2003 9:00
●	Packing	May 29, 2003 11:00 AM	May 29, 2003 11:00
●	Arrival Center	May 30, 2003 5:00 AM	May 30, 2003 5:00
●	Loading Begin	May 30, 2003 7:00 AM	May 30, 2003 7:00

The bottom section shows a 'Dispatch Area' map with yellow markers indicating asset locations. A 'Group Properties' dialog box is open, showing details for '4 EngineAssets' with 4 values, EPC #00012345678901234, and Engine Number 1234.



Next Steps: How to Get Started

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