Agenda

1. Background: SAP and Auto-ID technologies
2. SAP solutions for Auto-ID and Item Serialization
3. Track & Trace at British American Tobacco
Auto-ID Technologies are key enablers of Track & Trace

- **RFID tag**
  - Chip for holding data
  - Antenna for communicating data
  - Range varies; usually several inches to feet
  - Active, passive, semi-passive

- **2D & 1D barcodes are also Auto-ID platforms:** cheaper, but need line-of-sight

- **Sensor and Wireless Mesh Networks** are up-and-coming Auto-ID platforms as well!

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Value-added business processes

- **Track & trace**
- **Product authentication**
- **Electronic proof of delivery**
- **Tracking Returnable Containers**
- **ePedigree**
- **Asset management, maintenance and repair**
- **Promotion and new product introduction**
- **Mesh networks, embedded systems, etc.**

**Operational efficiency**
- Physical movement of items updating ERP transactions
- Advanced Shipment Notice (ASN)
- Automated receipt and delivery
- Reduce rework and manual intervention

**Compliance**
- Retail mandates
- DoD
- Pharma

**Market Evolution**

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SAP Real-World Awareness (RWA) Program: 11 Years of Thought and Market Leadership in RFID

1998
SAP Research starts RWA Program

2000
Forrester: SAP is Leader

2008
General Session SAP and Intel

2002
CGT magazine: Readers Choice & Early Adopter

2007
European Auto-ID Award

2003
METRO Future Store Pilot

2006
IDC Innovation & Bus. Transformation Award

2006
SAP MVP Award to RWA team

2006
Gartner: SAP #1 in market share

2004
Forrester: SAP is Leader

2006
Best Pilot: Purdue
Best Implement.: Jena
Best Integration: Biomet

1999
1st Software Member

2006
Gartner: SAP #1 in market share

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SAP RWA Program

- Wide customer base
  - 500 RWA Customers
  - 18 countries
  - 17 industries
  - 70+ reference customers

- $ X Million generated 2004-09
  (hint: X has 9 digits)
- Ranked No# 1 by analysts
- Rich Ecosystem
  - 25+ partners
  - Certification Program

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Customer successes confirm the importance of integration with business systems & process

<table>
<thead>
<tr>
<th>Example Scenario</th>
<th>Value Drivers</th>
<th>Internal Tag Observations</th>
<th>Material Master / Perpetual Inventory Data</th>
<th>Transactional Data</th>
<th>Asset Data</th>
<th>Employee Data</th>
<th>Manufacturing Data</th>
<th>Commercial Data</th>
<th>Supply Chain Planning Data</th>
<th>External Tag Observations</th>
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<tbody>
<tr>
<td>Proof of Delivery</td>
<td>Reduced Deductions Cash Flow</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Consignment Management</td>
<td>Productivity Accuracy Cash Flow</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Forecasting and Replenishment</td>
<td>Revenue Inventory</td>
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<td>X</td>
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<td>X</td>
</tr>
<tr>
<td>Manufacturing Process Integration</td>
<td>Productivity Accuracy Compliance</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Hospital Prescription Management</td>
<td>Productivity Accuracy Improved Medical Result</td>
<td>X</td>
<td>X</td>
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<td>X</td>
</tr>
</tbody>
</table>
### Real World Awareness: Enabling Fundamental Capabilities

#### Visibility
- Automatic detection and response to events
- Visibility
- Accuracy

**Examples**
- Procurement
- Fulfillment
- Transportation
- Production malfunction
- Railcar management
- ...

#### Unique ID / Serialization
- Unique Identification EPC/UID/ ...
- Object centricity

**Examples**
- Authentication
- Track and trace
- Product genealogy and compliance
- Product as a Service
- ...

#### Enriching Business Processes
- Automation
- Increasing fidelity and accuracy

**Examples**
- Automated shipping and receiving
- Order-to-cash
- Preventive maintenance
- Returns processing
- ...

#### Real-Time Decision Support
- Event-driven applications
- Analytics

**Examples**
- Responsive replenishment
- Out-of-stock reduction
- Risk management
- Product diversion
- ...

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**Facts around Movilitas**

**Focus:**
- 100% focused in mobility and Track & Trace solutions (RFID, 1D, 2D Barcodes)

**History:**
- Company creation in February 2006 (3 founders)
- Today 45 employee
- Headquarter in Mannheim, with sales offices in Munich, Spain and Prague
- SAP “Spin Off”: >12 employee of Movilitas have worked at SAP before

**Customers and projects:**
- Novartis, British American Tobacco, Boehringer Ingelheim, PCK refineries, Daimler AG,
- Coca Cola Company, Coca Cola Hellenic Bottling, SABMiller Latin-American,
- Transmark, Pilsner Urquell (SABMiller), Fraport, United Paper Mills, Mammout, Welsh Water, Centrica, Brunata, Deutsche Post, Pfalzwerke etc.
**Movilitas Consulting AG**
- Specialized in implementation of SAP NetWeaver Mobile and SAP xApps. Mobile, SAP All and SAP OER
- Experts for „mobile“ business processes
- #1 in Europe for Track & Trace with SAP OER

**Movilitas LogCentre**
- Mobile & RFID Lab in our headquarter Mannheim
- LogCentre Partnership with e.g. SAP, Motorola, Intermec, Vodafone, Microsoft Windows Mobile, Zebra, noFilis, Panasonic
- Lab is used mainly by SAP customers for rapid prototyping around mobile and RFID

**Movilitas Solutions GmbH**
- Software development
- Roll-in of requirements by Consulting AG and LogCentre
SAP for Auto-ID and item serialization

Enterprise Systems

SAP RFID

Object Event Repository

Auto ID Infrastructure (Site Component)

Partner Systems

External RFID System Vendors

Non-SAP Apps

SAP ERP

SAP GRM

Non-SAP Apps

ePedigree

ASN

Non-SAP Apps

Non-SAP Apps

Non-SAP Apps

Movilitas Consulting

Consulting
All Pieces Working Together

EPCIS + Repository + Applications
Provides Enterprise level Event-driven Analytical and Visibility Applications

Business Event Processing
Enables and manages Operational Processes integrated with ERP at local / regional level

Movilitas Consulting
SAP Auto-ID Infrastructure
How does SAP Auto-ID Infrastructure work?
Converting Raw Signals Into Business Value

Event-Driven Analytical Applications

Business Context

Raw Sensor Reads
Preconfigured Business Processes

SAP solutions for Auto-ID and Item Serialization

- Platform to provide business context
- Rules, activities, event handlers, data management, integration, and so on
- Gateway to SAP applications
SAP Object Event Repository
SAP object event repository (SAP OER)

Core EM services
- Object representation, hierarchy
- Ruleset (authentication, alerting…)
- Document tracking
- Archiving

Common services
- Central number range mgmt.
- Master data mgmt.
- Location-based security

Capture and query interface

Application interface

Web front end

Business intelligence interface

Back-end systems
- SAP ERP

Third-party application
- Devices

SAP Auto-ID Infrastructure

Partner edge

Portal
- SAP NetWeaver Portal

Analytics
- Business Intelligence

Movilitas Consulting
SAP Object Event Repository
Overview of capabilities

Supports EPCs, iUID and custom unique identifier related data discovery

Data discovery for
- Business documents Ids
- HU IDs
- Instance product/part identifiers
- Qualified events
- Attributes

EPCIS compliant

Can support B2B Pedigree on demand queries

Track expected and actual events and be alerted to overdue event schedules

Event data exchange with business network partners

EPCIS is to enable disparate applications to leverage Electronic Product Code (EPC) data via EPC-related data sharing, both within and across enterprises. Ultimately, this sharing is aimed at enabling participants in the EPCglobal Network to gain a shared view of the disposition of EPC-bearing objects within a relevant business context.
Serialization, Track & Trace

- Manufacturing & Serialization
- Storage and/or Distributor
- Wholesaler
- End Customer

SAP OER

- Authentication
- Changes in Packaging Hierarchy
- Recall
- Disbanding

Info about serialized items
SAP Solutions for Auto-ID and Item Serialization (Product Tracking and Authentication)

**Process:**
- Production on track
- Shipment received
- Unpack
- Ship
- Receive
- Production complete
- Wrong Pack
- Send ASN
- Pack

**Context:**
- Production
- Warehousing
- Distribution
- Sale

**Edge Apps Auto ID Infrastructure**
- Third party Supplier
- Outsourced or in-house production
- Warehouse
- Distribution Center
- Retailer

**Enterprise Apps Object Event Repository**
- Production on track
- Shipment received
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- Ship
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- Production complete
- Wrong Pack
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- Pack

**Process:**
- Inbound Receiving
- Manufacturing
- Tag Commissioning
- Security marking
- Hierarchy build
- Shipment Notification
- Outbound Shipment

**Context:**
- Inbound, Outbound Delivery, Sales Order, PO

**Edge Apps Auto ID Infrastructure**
- Inbound Receiving
- Hierarchy break up
- Move Cases
- Hierarchy build
- Shipment Notification
- Outbound Shipment

**Context:**
- Inbound, Outbound Delivery

**Process:**
- Inbound Receiving
- Hierarchy break up
- Move Items
- Hierarchy build
- Shipment Notification
- Outbound Shipment

**Context:**
- Inbound Delivery

**Table:**

<table>
<thead>
<tr>
<th>What</th>
<th>Where</th>
<th>When</th>
<th>Context</th>
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</thead>
<tbody>
<tr>
<td>Delivery</td>
<td>Dist</td>
<td>Tus 3 PM</td>
<td>Receive</td>
</tr>
<tr>
<td>Delivery</td>
<td>Dist</td>
<td>Thr 10 AM</td>
<td>Ship</td>
</tr>
<tr>
<td>Item</td>
<td>Retail</td>
<td>Fr 2 PM</td>
<td>Floor</td>
</tr>
</tbody>
</table>

**What**
- Delivery

**Where**
- Dist
- Retail

**When**
- Tus 3 PM
- Thr 10 AM
- Fr 2 PM

**Context**
- Receive
- Ship
- Floor
SAP Solutions for Auto-ID and Item Serialization (Product Tracking and Authentication)

**Product Tracking** based on ID, hierarchy, status, location, context and other characteristics

**Product Authentication** automated, multi-layered, on other characteristics

**Compliance against regulations**

**Manage Expire, recall and returns**

**Chargeback management**

**Process:**
- Outbound Shipment
- Context: SO Outbound Delivery

**Process:**
- Inbound Receiving
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**Process:**
- Inbound Receiving
- Hierarchy break up
- Move Items
- POS
- Context: Inbound Delivery

**Verification** Shipment and receipt verification

**Enterprise Apps** Object Event Repository

**Edge Apps** Auto ID Infrastructure

Supply Chain Third party Supplier Outsource or in-house production

Warehouse

Distribution Center

Retailer
Auto-ID Deployment Option - I
Connected with OER (no ERP)
Key Points of SAP Solutions for Auto-ID and item serialization

Processes
- Linking sensor and RFID data with business processes
- Preconfigured out-of-the-box processes available including operational monitoring and aggregated reporting
- Easy implementation of individual processes due to a high flexible infrastructure

Standardization
- Support of established data format Standards
- Active participation of SAP in all relevant standardization committees and research projects
- Continuous enhancement of supported standards according to new developments across industries

Partner ecosystem
- Global partner network for all areas (Device management, hardware, service)
- Certification program guarantees seamless integration of devices

Architecture
- SAP Auto-ID Infrastructure is based on SAP NetWeaver Technology to provide a scalable and robust platform
- Seamless integration into the existing SAP solution landscape
- Ensuring data security by fulfilling SAP’s security guidelines
Thank You