Manufacturing Execution

Service Offering SAP ME

Dr. Alfrid Kussmaul
HP + EDS delivers value and results

Customer Value

Comprehensive end-to-end IT services Portfolio

Delivered Globally

Based on market-leading technology and Innovation

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Reducing cost of IT service delivery and increasing business value

Technology platform leadership

Established, market-leading services breadth and depth

Shared Standard Services Model and expertise for mid-market customers

Industry reach across 9 major industries

Innovation from HP Labs, annual R&D investment of $3.6B

Global Delivery

Marketing leadership

Commitment to Service Excellence

Deep experience successfully integrating companies

Market leadership across ITO segments

Commitment to Service Excellence

Reducing cost of IT service delivery and increasing business value

SAP ME - Manufacturing Execution by EDS
EDS SAP Practice
Services and Enablers

SAP Solutions & Consulting

- SAP Consulting
- SAP Implementations
- SAP Upgrades
- SAP Integration
- SAP Application Management and Hosting
- EDS Agility Alliance
- Methods, Tools and Technology
- Integrated Enterprise Methodologies
- Competency Centers
- Industry Focus

SAP ME - Manufacturing Execution by EDS

/// 4 / March 2009
EDS is first global Run SAP® Partner

EDS is the first company to be certified by SAP AG to provide solution implementation and solution operations for clients using the Run SAP® methodology.

Run SAP is “ASAP for Operations”
It provides Best Practices, Content, Services, Training and Tools for E2E Solution Operations

Run SAP facilitates the implementation of E2E Solution Operations

SAP Standards for Solution Operations
Define central E2E operations tasks

Roadmap
Accelerate the implementation of E2E operations

Trainings & Certification
Provide up-to-date skills for the ecosystem

Services
Engage SAP to implement E2E operations

SAP Solution Manager
Provides all tools for E2E operations
MES at a Glance

Planning Horizon

Enterprise-wide

Production (Program) Planning, Master Data Maintenance

Planning data and restrictions

Current production data Plan variance

Detailed Resource Planning & Allocation, Production Monitoring, Data Collection, KPIs

Reactions on incidents during production

BDE & MDE data from production

Domain-specific

Level of Detail

Execution, Production Logistics

Production / Automation Systems

Manufacturing Execution Systems (MES)

ERP

Business Partners

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/// 6 / March 2009
Case Study - General Motors GEPICS

• **EDS has build a third generation automotive OEM MES solution**
  - One solution for all plants around the globe
  - Very high availability (greater 99.95 % across all layers) measured in client business metrics
  - Completed last year, now in roll out phase to 63 assembly plants

• **EDS is implementing the system in all locations**
  - Involves training of end users, project management and overall coordination
  - Installation and test of all hardware, software and infrastructure
  - Preparation, coordination and execution of data migration
  - Roll out completion planned in two years

• **EDS secures ongoing operations**
  - EDS operates current and new systems
  - EDS delivers around the globe 7*24 across all support levels
  - EDS provides and maintains disaster recovery and failover solutions for high availability
GEPIICS Release Status: 63 sites current as of Feb 2009

SAP ME - Manufacturing Execution by EDS
**MES Reference Implementation: DEUTZ AG**

**Customer: DEUTZ AG / Germany**

- More than 140 years in automotive business
- Generates about $1.6 Billion revenue, and has business presence in more than 130 countries around the globe
- Delivers engines for automotive OEMs (e.g. VOLVO & Renault) and needs to be very competitive to win business against OEM in-house manufacturing
- Has chosen EDS as its IT partner since 1990. EDS has contributed to the client success through the implementation of an cost–effective IT infrastructure and the ongoing support of the systems
- **MES** (at DEUTZ called “MLR”) is a key value-added item for DEUTZ

**EDS Services for DEUTZ**

- Manufacturing Services (Consulting & Implementation)
- Applications Development Services
- Engineering Services (PLC Programming, Maintenance)
- Project & Program Management
- Provision of MES-System for all plants
- Operations and Support of MES-System in all plants
### Specification of Core MES Functionalities

| Dynamic Routing | Provides algorithms to achieve real-time load balancing in a stochastic processing environment and thus to increase the performance of the system, in throughput, workload balance and reduced work in-process queues  
Route, in real-time, the intermediary or Work-In-Process (WIP) to the appropriate stations, based on the current state of the manufacturing system  
Dynamic manufacturing process modelling |
| --- | --- |
| Traceability / Genealogy | Captures and references complete and permanent genealogy record of products, including complete multi-level detail, and enables quick electronic recall of product, process, resource and material information  
Tracks, collects and verifies information about components assembled into the parent  
 Creates audit trail of all processes, resources, components and materials used during the manufacturing and packaging of product (from “order to shipment”)  
Work in Process (WIP) tracking |
| Manufacturing Execution / Control | Assort manufacturing sequence  
Adjust order sequence (PDA)  
Provide required resources  
Activate, manufacture and terminate order  
Monitor machinery  
Lock parts, record waste, register reparation needs |
| Resource / Equipment Management | Request resources during production  
Provide, assemble and dismount resources  
Consign resources (externally)  
(Plan) Resource reparation and maintenance |
<table>
<thead>
<tr>
<th>Specification of Core MES Functionalities</th>
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<tbody>
<tr>
<td><strong>Product Data Acquisition (PDA)</strong></td>
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<tr>
<td>▪ Record and display production data</td>
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<td>▪ Verification, processing, analysis and transfer of production data with the goal of acquiring information about machine utilization, quality, order status etc.</td>
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<tr>
<td><strong>Shop Floor Management</strong></td>
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<tr>
<td>▪ Executes manufacturing and maintenance processes and manages all of the information required for fabrication, tooling, sub-assembly and final assembly</td>
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<tr>
<td>▪ Provides real-time information and complete visibility about what operations are running, complete, on hold, have non-conformance tags against them, etc.</td>
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<tr>
<td><strong>Machine Control</strong></td>
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<tr>
<td>▪ Collect plant and machine data</td>
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<td>▪ Control lead time parallel to production and monitor released orders</td>
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<tr>
<td><strong>(Production) Inventory Management</strong></td>
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<tr>
<td>▪ Record and track stocks of materials on a quantity and value basis</td>
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<tr>
<td>▪ Plan, enter, and document stock movements such as goods receipts, goods issues, physical stock transfers, and transfer postings</td>
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<tr>
<td>▪ Performance of physical inventory (stock-taking)</td>
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SAP MII: Fully integrated End-to-End Business Process Management

Manufacturing Intelligence

Inbound
- Security Transformation Workflow
- Outbound
- Message Enrichment
- Message Format
- Message Transfer
- Message Callback

Web Services
- SOAP
- IDOC
- SOAP

SAP ME

SAP ERP

Source of the graphic: SAP 2009

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March 2009
SAP ME and SAP ERP logical Landscape

**Enterprise Resource Planning**
- Plant Maintenance
- Inventory and Warehouse Management
- Quality Management
- Master Data Authoring and Engineering Change Management
- Production Planning

**Manufacturing Execution**
- WIP (Lot and Serial #) Tracking and Genealogy
- Manufacturing Process Control
- Defect Tracking and Resolution
- Data Collection
- Labor Tracking

**Key Features**
- Order Status
- Yield Confirmation
- Scrap Confirmations
- Labor Confirmation
- Component Consumption
- Tool Usage
- As-built Record
- Quality Notification
- Batch Characteristics

Source of the graphic: SAP 2009

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**MES System SAP ME / Visiprise – Overview**

### Visiprise Process Planning
- Computer-Aided Process Planning (CAPP)
- Bill of Material Management (BOMM)
- Manufacturing Change Management (MCM)
- Shop Floor Management
- Project Management Integrator (PMI)
- Tool Management

### Visiprise Manufacturing Operations
- Real Time Statistical Process Control (SPC)
- Engineering Change Management (ECM)
- Test & Repair
- Labor Tracking
- Traceability
- Production Transfer
- Return & Repair

### Visiprise Quality Management
- Corrective & Preventative Action (CAPA)
- Nonconformance Management (NCM)
- Historical Statistical Quality Control (SQC)
Includes:

- **Visiprise Computer-Aided Process Planning (CAPP)**
  allows planners to easily define the manufacturing and assembly process using multi-media functionality.

- **Visiprise Bill of Material Management (BOMM)**
  manages the reconciliation of part content between engineering BoMs, manufacturing BoMs and As-Built BoM.

- **Visiprise Manufacturing Change Management (MCM)**
  documents, routes, audits and monitors each change from initiation through incorporation to manufacture.

- **Visiprise Shop Floor Management**
  executes manufacturing and maintenance processes and manages all of the information required for fabrication, tooling, sub-assembly and final assembly
SAP ME Manufacturing Execution

- **Visiprise Real-Time SPC**
  gathers product and process-related information in real-time and through event management, trigger alerts and alarms raised through trending data control quality and reduce variability of products currently in production.

- **Visiprise Engineering Change Management (ECM)**
  manages product and process changes driven by design integrity, inventory, cost control and other issues, ensuring effective closed-loop feedback.

- **Visiprise Test & Repair**
  a comprehensive repair loop management environment for manufacturing processes that supports continuous improvement initiatives and repair tracking.

- **Visiprise Labor Tracking**
  tracks employee time and attendance on the shop floor as well as time spent working on specific components and units for labour cost allocation.

- **Visiprise Traceability**
  captures and references a complete and permanent genealogy record of products, including complete multi-level detail, and enables quick electronic recall of product, process, resource and material information.

- **Visiprise Production Transfer**
  enables configuration and automatic transfer of all product configuration data to single or multiple sites.

- **Visiprise Return & Repair**
  tracks returned components and products through their product lifecycle, retaining valuable information to support effective product management.
SAP ME Quality Management

• **Visiprise Corrective and Preventative Action (CAPA)**
  Integrated functions for correction and prevention which provide for continuous optimization. It contains a user-friendly method for controlling, repairing, returning and/or predicting problems.

• **Visiprise Nonconformance Management**
  Provides for the management and reprocessing of identified non-conformance materials.

• **Visiprise Historical SQC**
  Visiprise Historical SQC administers the quality of products based on exact statistics which are generated from the large amount of historical production data.
One of the biggest SAP ME Delivery Pools worldwide
+ 650 MES Resources globally in the Manufacturing Industry
+ 700 SAP Resources globally with focus on Manufacturing
Thank you very much for your attention.

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