Roadmap & Timelines & Solution Overview
SAP Asset Strategy & Performance Management
August 2017
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SAP Leonardo - Digital Asset Suite

SAP S/4HANA
- Asset Register
- Maintenance Management (Work Execution)

SAP Asset Intelligence Network
- Collaborate Equipment Register
- Portal for Maintenance & Service Collaboration
- Track assets across business partners

SAP Predictive Maintenance & Service
- Condition Monitoring
- Maintenance Optimization
- Machine Learning

SAP Asset Strategy & Performance
- Risk and Criticality
- Strategic Planning
- Lifecycle Optimization

Collaborate with the Business Network

Operate with the System of Record

Innovate with the System of Intelligence

Plan with the System of Differentiation

Leonardo Foundation
Vora / Hadoop
SAP Enterprise Asset Management
Integrated applications supporting holistic asset management

Digital Core
- SAP HANA
- SAP Hybris
- SAP SuccessFactors
- Concur
- SAP Fieldglass
- SAP Ariba

Digital Innovation
- SAP Leonardo
  - Internet of Things
  - Machine Learning
  - Big Data
  - Modern Analytics
  - Blockchain
  - Data Intelligence

Optimization
- Asset Strategy and Performance
- Asset Information Collaboration
- Predictive Maintenance and Service
- Mobile Asset Management

Management of Change
- Maintenance Planning and Scheduling
- Asset Information Governance
- Maintenance Safety and Permit to Work

Health and Safety Management
- Maintenance Execution
- Environment Management
- Incident Management

SAP HANA

SAP Cloud Platform
SAP Asset Strategy and Performance Management

Analyze criticality of assets and optimize maintenance strategies

**SAP Asset Strategy and Performance**

**Solution Capabilities & Benefits**

- **Maintenance Strategy Management** (Facilitates the development of operational strategies to define actions and their mitigated risks for any asset, providing the ability to evaluate existing plans with basic qualitative risk analysis)
- **Lifecycle cost analysis** (Analyse asset lifecycle costs and when to "repair vs. replace" by capturing all relevant cost data associated to the entire fleet)

**Benefits**

- **Improve reliability by using standard methodologies** for lowering risks, maintenance cost, downtime, and energy consumption
- **Reduce bottlenecks and prevent recurrence of incidents.** Hold consistent asset performance reviews, monitor asset performance, and optimize improvement plans
- **Reduce outages and resolution time** by updating asset strategy and performance from preventive to condition-based maintenance.
Benefits
- Increase overall asset availability
- Decrease MTBF - Increase equipment reliability
- Better utilization of assets
- Control Maintenance spend
- Reduce work backlog
- Identify savings opportunities through preventive and predictive maintenance
- Reduction of capital tied-up in spare parts inventory
- Adopt a proactive and targeted maintenance strategy
- Ability to change the sequence of processes using Point Apps

Solution Integration Points
- SAP Asset Intelligence Network
- SAP Predictive Maintenance & Service
- SAP Enterprise Asset Management
- SAP ERP (MM, FICO, PP)
- SAP Integrated Business Planning

Process Innovation

Classification of Assets into Groups
Asset Criticality / Risk Assessment
Collaborative Failure Modes Library
Perform FMEA

Analyze Systems & Functions
Perform RCM
Analyze / Optimize Maintenance Strategy
PM Review

Perform RCA, ETA
Bad Actor Management & Spares Optimization
Integrations / Extension Points to 3rd party systems
CAPEX / OPEX inputs to Maintenance Strategy
Logical Architecture for Asset Management System and Product View

- Engineering Systems
  - SAP Asset Intelligence Network
    - SAP Leonardo
  - SAP Asset Strategy and Performance Management
    - SAP Leonardo (planned)
  - SAP Predictive Maintenance and Service
    - SAP Leonardo
- SAP Extended Enterprise Content Management
  - SAP Master Data Governance EAM extension
    - OPENTEXT
  - SAP Geo Enablement Framework
    - SAP S/4HANA
- Digital Core
  - SAP Asset Intelligence Network
  - SAP Asset Strategy and Performance Management
  - SAP Predictive Maintenance and Service
- IoT Foundation
  - SAP Leonardo
- Connected Assets
  - OT Systems
  - Other Sources
- Mobile
  - IoT
  - OSI/PI
  - MII/PCo
  - Other Sources
Asset Strategy and Performance Management
Main Blocks

- Asset Criticality Assessment
- Asset Management Strategy
- Asset Management Monitoring
- Life Data / Bad Actor Analysis
- Asset Management Implementation

Legend:
- ASPM
- PM
- PdMS

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Asset Criticality Assessment

Which are the critical assets? Which assets are likely to benefit most from application of which analytical processes (i.e. RCM, FMEA)?

- Description:
  Assessment of asset (i.e. equipment, location and group of) criticality based on risk score.
  Informed assessment based on historical maintenance data and relevant KPIs (EAM/PdMS integration).
  Calculation of risk score based on different dimensions and scales and for different impact categories.
  Supporting the selection of the most appropriate analytical process (i.e. RCM/FMEA, PM review, CM) based on the result of the criticality assessment.
Asset Criticality Assessment

Asset Strategy and Performance Management

Asset Criticality Assessment

This is the current state of planning and may be changed by SAP at any time.
Asset Strategy and Performance Management
Asset Criticality Assessment

This is the current state of planning and may be changed by SAP at any time.
Asset Strategy and Performance Management

Criticality Assessment
Asset Strategy and Performance Management
Asset Management Assessment

Asset Management Strategy
What asset management strategy (CM, PM, CBM, PdM) is appropriate at asset and, eventually, failure mode level? How can the current maintenance strategy be improved?

- Description:
  Supporting the identification of recommended actions at asset and, eventually, failure mode level by providing RCM/FMEA capabilities.
  Supporting PM review and optimization.
  Integrating OEM/3rd party content libraries.
  Enabling collaboration with manufacturers and service (e.g. content) providers on failure modes, recommended actions, etc.
  Identifying the optimal maintenance strategy among different scenarios based on risk, cost and performance objective functions.
Asset Strategy and Performance Management

Asset Management Assessment

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Asset Strategy and Performance Management
Asset Management Assessment

This is the current state of planning and may be changed by SAP at any time.
Asset Management Monitoring

How is the asset and the asset management strategy performing?

- **Description:**
  Providing dashboards and reporting capabilities to monitor asset performance in terms of relevant KPIs for different categories (reliability, availability and maintainability, capacity, output quantity, output quality, safety and environment impact, etc.)
  Providing dashboards and reporting capabilities to monitor the efficiency and effectiveness of asset management strategy.
  Triggering and supporting informed updates of asset management strategy.
Asset Management Monitoring

How is the asset and the asset management strategy performing?

- **Requirements:**
  - Different sections for different categories, i.e. 1. financial (for costs), 2. reliability (for number of failures), availability, maintainability (for available spare parts), 3. performance (for production performance), etc.
  - Ability to drill down from the very high level (i.e. company, installation, plant) to the single asset, i.e. overall availability of the production plant > availability of all pumps in the production plant > availability of the single pump in the production plan. The same applies to all sections, categories, KPIs.
  - Ability to show the current as well as the historical behavior, i.e. current reliability and reliability behavior for the past 10 years (the user should define the desired time window)
  - Ability to forecast future behavior, i.e. reliability trend for the next one year (the user should define the desired time window)
  - Actual vs. target/expected
Asset Strategy and Performance Management
Asset Management Monitoring

This is the current state of planning and may be changed by SAP at any time.
SAP Asset Strategy & Performance Management

Product Road map overview

**Current Q4/2017**

- **Equipment, Models,**
  - Timeline to provide a logbook all activities to an equipment
  - Location maps including point, line and areas
  - Internal IDs for all objects
  - Spare Parts handling with documents, templates, and equipment level quantities
  - Announcements at Serial Number level
  - Export to Excel
  - 3D Parts file searching with x-ray view
  - Historical Work Order / Logbook
  - Enhanced Model to Equipment bridge for sync of structure
  - Network and System Topology
  - Subscribe to data changes

**Integration**

- Integration with existing ticketing systems (C4S)

**Current Q4/2017**

- **Equipment Criticality Assessment**
  - Configurable assessment templates
  - Smart grouping of Equipment & Locations for quick assessments
  - Assess Risk and Criticality
  - Questionnaires and Checklists

**Failure Modes**

- Collaborative Failure modes from OEMs, 3rd Party libraries and Service Providers
- View / Assign Failure modes based on ISO subclasses, Categories and Models
- Analyze previous failures using Work-Order / Notification history

**PM Review**

- Review tasks across all maintenance plans by Cost and Maintenance Type (Repair vs Replace)

**Failure Modes, FMEA & RCM**

- Perform FMEA for identified equipment and assign a Risk Priority Number
- Comparison of Controls to existing Maintenance plans and actions
- Cascade Risk Priority Number to System, Function and Locations

**Integration**

- SAP PdMS integration for Probability of Failure, Asset Health, insights from text analysis of Notifications Long Text
- SAP S4HANA for Work Orders, Notifications, Criticality and Failure Modes
- Enhanced EAM integration for Maintenance Plans, Tasks and Operations

**PM Review**

- Recommend changes to maintenance plans based unmitigated risk reduction
- Review strategy with Reliability reports to plan corrective actions

**FMEA & RCM**

- Perform Root Cause Analysis using Defect elimination

**Integration**

- Further integration to SAP PdMS for Weibull, Trends, other insights
- S4HANA for Costing of activities
- ME/MII for operational usage information
- SAP IBP integration for impacts on cost / risk due to Maintenance Plan changes
- 3D Printing with SAP Digital Manufacturing
- Hybris integration for shopping cart

**Planned Q1/2018**

- **PM Review**
  - Review strategy with Reliability reports to plan corrective actions

**Planned Q2/2018**

- Integrations
  - Further integration to SAP PdMS for Weibull, Trends, other insights
  - S4HANA for Costing of activities
    - ME/MII for operational usage information
    - SAP IBP integration for impacts on cost / risk due to Maintenance Plan changes
    - 3D Printing with SAP Digital Manufacturing
    - Hybris integration for shopping cart

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Some Screen shots of AIN and ASPM
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Weather:
- Minimum Temperature: 274.2°F/EK
- Maximum Temperature: 278.4°F/EK
- Humidity: 97.8%
- Forecast: light rain

High Humidity. You should operate at a lower rpm.
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0. Asset Definition
- Reliability Block Diagram
- Asset hierarchy
- Asset information
- Group assets

1. Asset Criticality Assessment
- Define risk matrix
- Select risk matrix
- Fill in risk matrix
- Risk matrix
- Assess criticality
- Select framework for further analysis
- Framework

2. Asset Management Strategy
- Simulation and optimization of different maintenance strategies
- Optimize maintenance strategies
- Maintenance strategy
- Define realistic maintenance strategy

3. Asset Management Implementation
- Implement maintenance strategy
- Asset Performance KPIs
- Manage spare parts
- Maintenance plan
- Distribute maintenance plans
- Create maintenance plans

4. Asset Management Monitoring
- Define business and maintenance management KPIs
- RPIs
- Evaluate KPIs
- Forecast KPIs
- Monitor business and maintenance management KPIs

X. Life Data Analysis (Bad Actor Analysis)
- Failure distributions and correlations
- Assess failure distributions and correlations
- Bad actors

Y. Root Cause Analysis
- Root cause analysis to investigate failure cases and update input for risk and criticality assessment
- Perform RCA

Legend
- Process
- Sub process
- Object
Thank you.