Redefining Asset Management in the Digital World
with Asset Network Solutions from SAP

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SAP Enterprise Asset Management (SAP EAM) solution
Trends in asset management

- ISO 55001, ISO 14001, ISO 45001, ...
- Optimizing cost, risk, and performance
- Balancing OPEX with CAPEX
- Meeting stakeholder expectations
- Empowerment of practitioners
- Collaboration between EPCs, OEMs, service providers, and operators

- Internet of Things (IoT) to scale connectivity
- Big Data for getting insight from IT and OT
- Analytics for prediction and simulation
- Machine learning to improve on business decisions
- Enterprise mobility to empower employees
- Cloud for collaboration
SAP Enterprise Asset Management
Asset management in an ever-more-connected world ...

Connecting corporate objectives with the asset system

Cost  Risk  Performance

Asset
Business needs analysis  Plan and design  Acquisition and commission  Operation and maintenance  Configuration and change management  Decommission and disposal

Connecting all stakeholders alongside the asset lifecycle

Manufacturer  Service provider
Supplier  Owner/operator
EPC  Dealer

IT  OT

Connecting IT with OT

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www.sap.com/eam
## SAP Enterprise Asset Management
Supporting asset management processes from end to end

<table>
<thead>
<tr>
<th>Portfolio and project management</th>
<th>Asset operations and maintenance</th>
<th>Environment, health, and safety</th>
<th>Asset network</th>
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<td>Incident management</td>
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<td>Portfolio management</td>
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<td>Project connectivity</td>
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<td>Maintenance safety and permit to work</td>
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Bimodal IT according to Gartner
Systems of record vs. systems of innovation

Mode 2
- SAP Leonardo portfolio
- Systems of innovation

Mode 1
- SAP Integrated Business Planning solution
- Systems of differentiation
- SAP S/4HANA
- Systems of record

Change

Governance

Source: Gartner
Envisioned logical architecture for SAP Enterprise Asset Management

Strategic direction

Run businesses
Hyper-automate business processes

Embrace data
Orchestrate data of any volume, velocity, and variety

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Envisioned logical architecture for asset management

More details

- SAP Asset Intelligence Network
  - SAP Leonardo

- SAP Asset Strategy and Performance Management
  - SAP Leonardo

- SAP Predictive Maintenance and Service
  - SAP Leonardo

- SAP Leonardo IoT Foundation
  - SAP Leonardo

- SAP Extended Enterprise Content Management
  - OpenText

- SAP Master Data Governance, EAM extension

- SAP Geographical Enablement Framework

- SAP S/4HANA
  - Digital core

- SAP MII, SAP Plant Connectivity

- OSI/PI

- IoT

- Connected Assets

- OT Systems

- Other Sources

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SAP's approach to asset information management

Consolidated processing of structured and unstructured information

- SAP Data Services
- SAP Master Data Governance, EAM Extension by Utopia
- SAP Extended Enterprise Content Management by OpenText
- SAP Information Steward
- SAP 3D Visual Enterprise
- SAP Asset Information Workbench by Utopia (planned)

SAP Management of Change

SAP S/4HANA or SAP ERP
SAP Asset Intelligence Network

www.sap.com/ain

Nameplate info
Maintenance strategy
3D parts # / BOM
Service bulletins and revs
Failure modes
Recalls
Safety controls
Process controls
Service bulletin
Designs and drawings
Design improvements
Sensor definition
Licensing
Operating instructions
Maintenance instructions
Safety instructions
Product training

Manufacturer  Service provider  Operator

Service bulletin receipt
Service bulletin processed
Usage information
Installation information
Failure / incident data
Design recommendations
Risks and controls
Measurement documents
Telemetry

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### SAP Asset Intelligence Network

#### Admin apps
- Business partners
- Authorizations
- Templates

#### Master data apps
- Models
- Equipment
- Locations
- Spare parts
- Documents
- Instructions

#### Process apps
- Performance improvement
- Obsolescence report
- Error code lookup

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<th>AIN Applications</th>
<th>AIN Administration</th>
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<tr>
<td><strong>Models</strong></td>
<td><strong>Equipment</strong></td>
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| ![995](#) | ![430](#) |
| ![Unread](#) | **Equipment Overview** |
| ![235](#) | ![474](#) |
| **Instructions** | **Performance Improvement** |
| ![474](#) | ![85](#) |
| **Documents**    | **Error Code Lookup** |
| ![Documents](#) | ![305](#) |

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SAP Asset Intelligence Network

Information
- Model information
- Model attributes
- Equipment attributes
- Installation information
- Lifecycle information

Structure and parts
- Structure
- Spare parts

Documentation
- Model documents
- Equipment documents
- Instructions
- Announcements

Monitoring
- Measuring points
- Error codes
- Improvement cases
- Timeline
SAP Predictive Maintenance and Service solution
From sensor to insight to outcome

Sensor
- Connected assets
  - Onboarding
  - Connectivity
  - Device management
  - Security

Data
- IT/OT convergence
  - Big Data ingestion
  - Big Data infrastructure
  - Merging sensor data with business information

Insight
- Data analysis
  - Root cause analysis
  - Asset health monitoring
  - Machine learning
  - Anomaly detection
  - Triggering of corrective actions

Action
- Maintenance activities
  - Prioritized maintenance and service activities
  - Optimized warranty and spare parts management
  - Prescriptive maintenance
  - Quality improvements

Outcome
- Business value
  - Customer experience
  - Increased quality
  - Lower costs
  - Operational efficiency
  - R&D effectiveness
  - Material procurement

Sensor Data Insight Action Outcome
How can information systems help?

Remote monitoring

Agile planning

Alerts and actions

SAP Leonardo IoT capabilities

Engineering rules

Life indicators

Distance scoring

Anomaly detection

Connected assets and sensors

OT systems (such as SCADA)

Other data sources (such as weather)

Digital core (SAP S/4HANA)
SAP Predictive Maintenance and Service solution

- Available through **cloud** or **on premise**
- Flexible **extension concept** to build industry- or customer-specific models and analytics
- A scalable **machine learning engine** that drives data science insights into our business processes
- **Flexible visualizations** across equipment structures
- End-to-end process integration … alert, discover, remedy
SAP Asset Strategy and Performance Management application (planned)

Classification of assets into groups → Asset criticality/risk assessment → Collaborative failure modes library → Perform FMEA

Analyze systems and functions → Perform RCM → Analyze/optimize maintenance strategy → PM review

Perform RCA, ETA → Bad actor management and spares optimization → Integrations/extension points to 3rd party systems → CAPEX/OPEX inputs to maintenance strategy

This is the current state of planning and may be changed by SAP at any time.
SAP Asset Strategy and Performance Management (planned)
Developing a maintenance strategy

- Functional analysis
- Criticality assessment
- Criticality
  - High
    - Reliability-centered maintenance
  - Medium
    - Failure modes and effects analysis
  - Low
    - Structured review

- Maintenance strategy
- Implement strategy in SAP ERP or SAP S/4HANA
- Collect work history
- Evaluate strategy and optimize
Line-of-business asset management solutions from SAP

Where to find more information about our road map and innovation

SAP road maps: http://www.sap.com/roadmaps
Innovation discovery: http://sapsupport.info/support-innovations/innovation-discovery/

Value maps: http://www.sap.com/solutionexplorer
Thank you.

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