

# Asset and Service Management

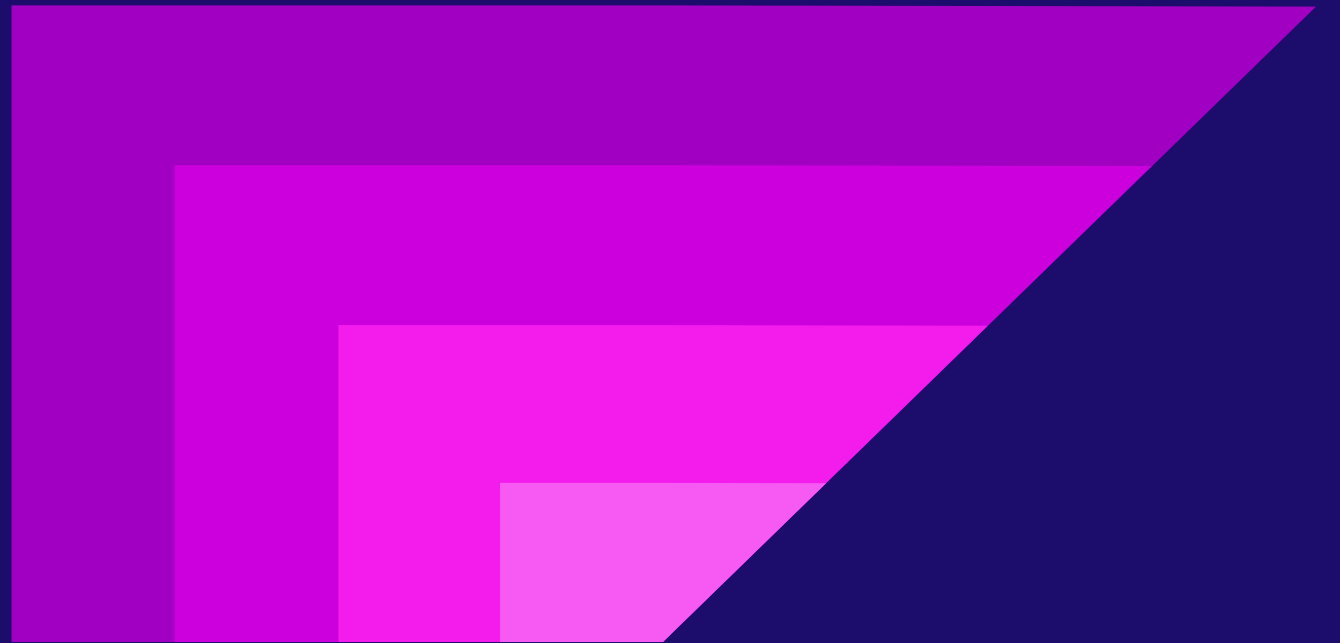
Maximize asset performance and deliver maintenance and service excellence

Jason Enti



# Trends

In Asset & Service Management



# Digitally enhanced enterprises need **next-level Enterprise Asset Management** to survive the future



## SaaS and cloud migration

38% of asset-intensive industries steadily converting legacy systems to cloud-based Enterprise Asset Management.



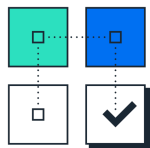
## Data and digital technology

95% of executives agree that an asset manager's technology, data and digital capabilities will be differentiators in 2025.



## Workforce transformation

Millennials are now the largest demographic in the workforce and require user grade digital applications and knowledge handover.



## Emergence of AI

AI transforms Asset Management, enhancing decision-making with predictive analytics, automation, and efficiency.



## Innovation accelerators

Enterprise Asset Management applications are increasingly integrated with AI, IoT, digital twin, augmented reality, and location-based service.

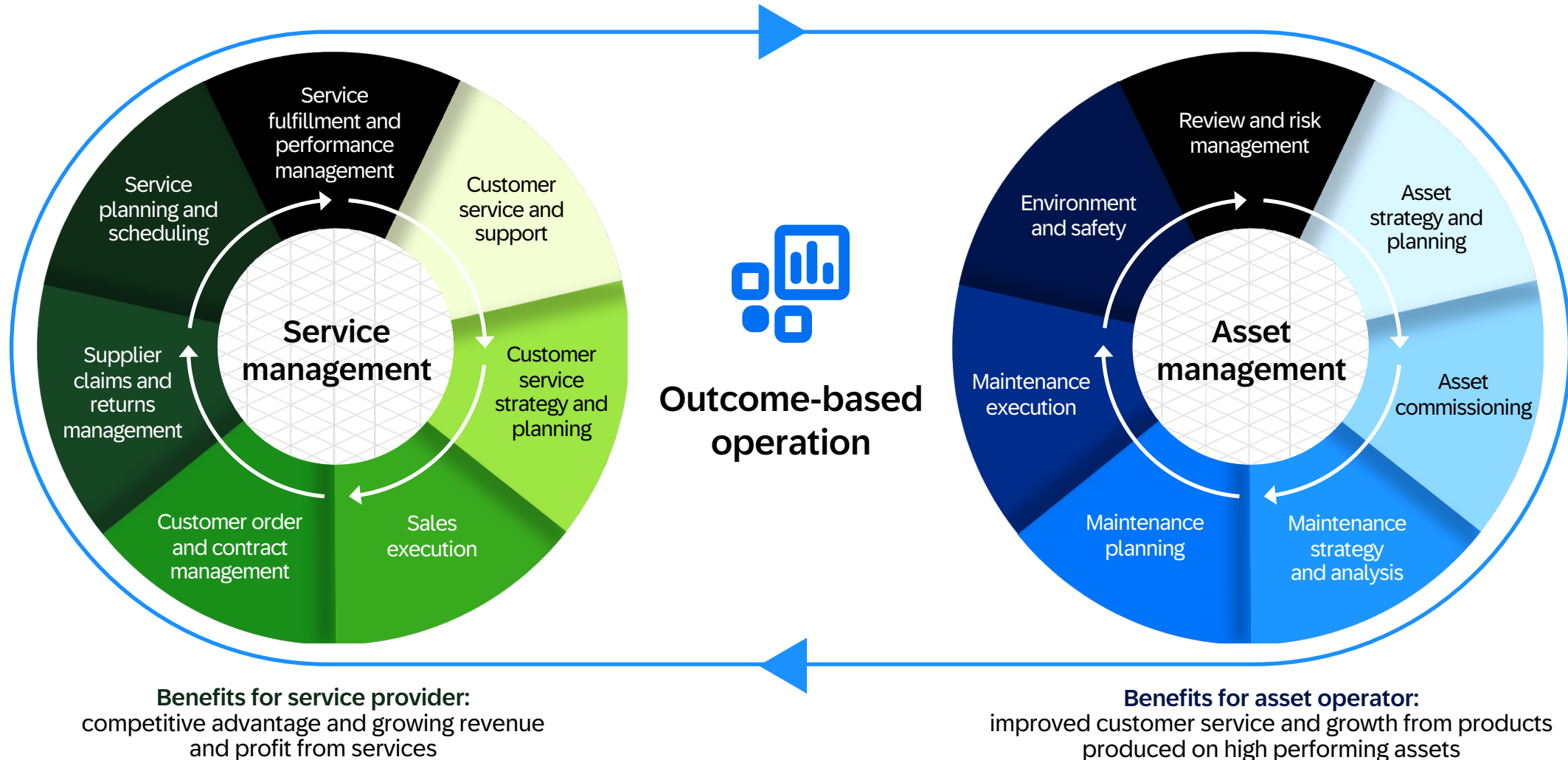


## Sustainability & ESG

Sustainability is driving companies to adopt green technologies, reduce carbon footprints, and comply with stricter regulations.

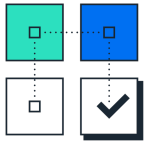
## New Market Dynamics

# Convergence of Asset Maintenance and Equipment Service Processes



# Business Drivers towards Excellence in Asset Maintenance and Service

Connected processes across enterprise to maximize asset operational efficiency



Objective

Maximize OEE

Drive Safe Operations

Reduce Cost



Essential attributes

Resource **Availability**  
Operational **Performance**  
Right **Quality**

Attention to **safety procedures**  
Protective equipment **availability**  
Workforce **safety training**

Annual service and maintenance **cost**  
Spare parts **cost**  
Energy **cost**



Business value

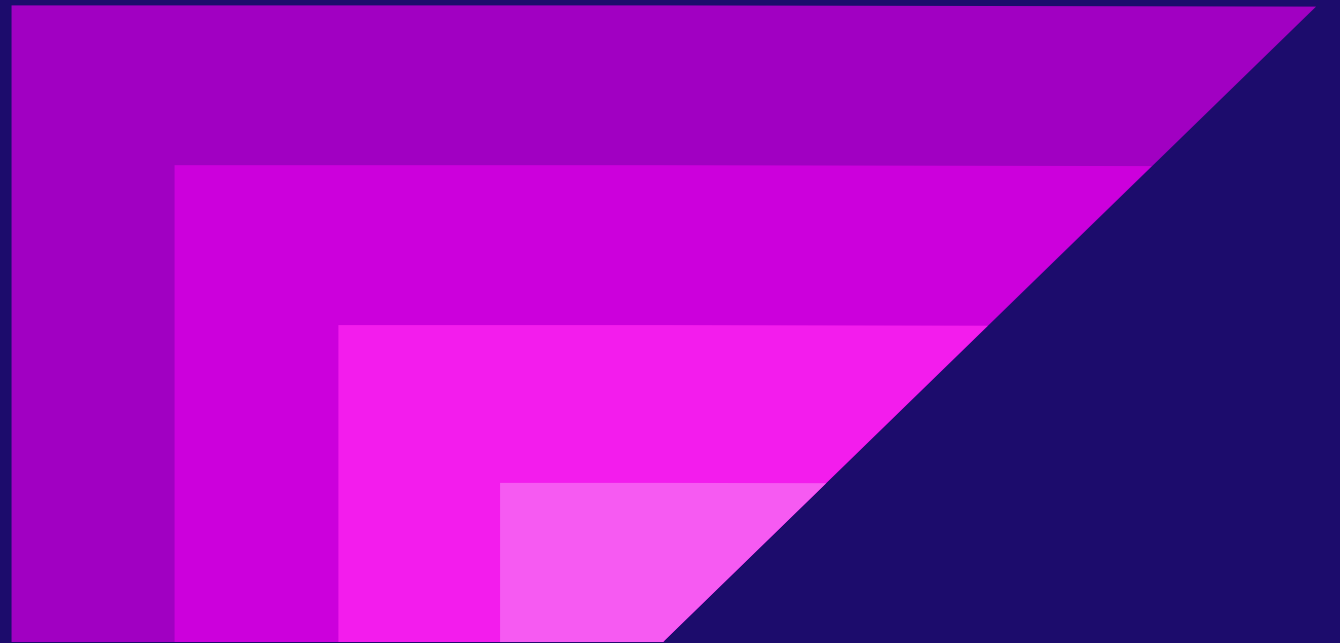
Increase Revenue

Sustainable and compliant Enterprise

Increase Operating Profit

# The Asset Lifecycle

Of a Chocolate Factory?

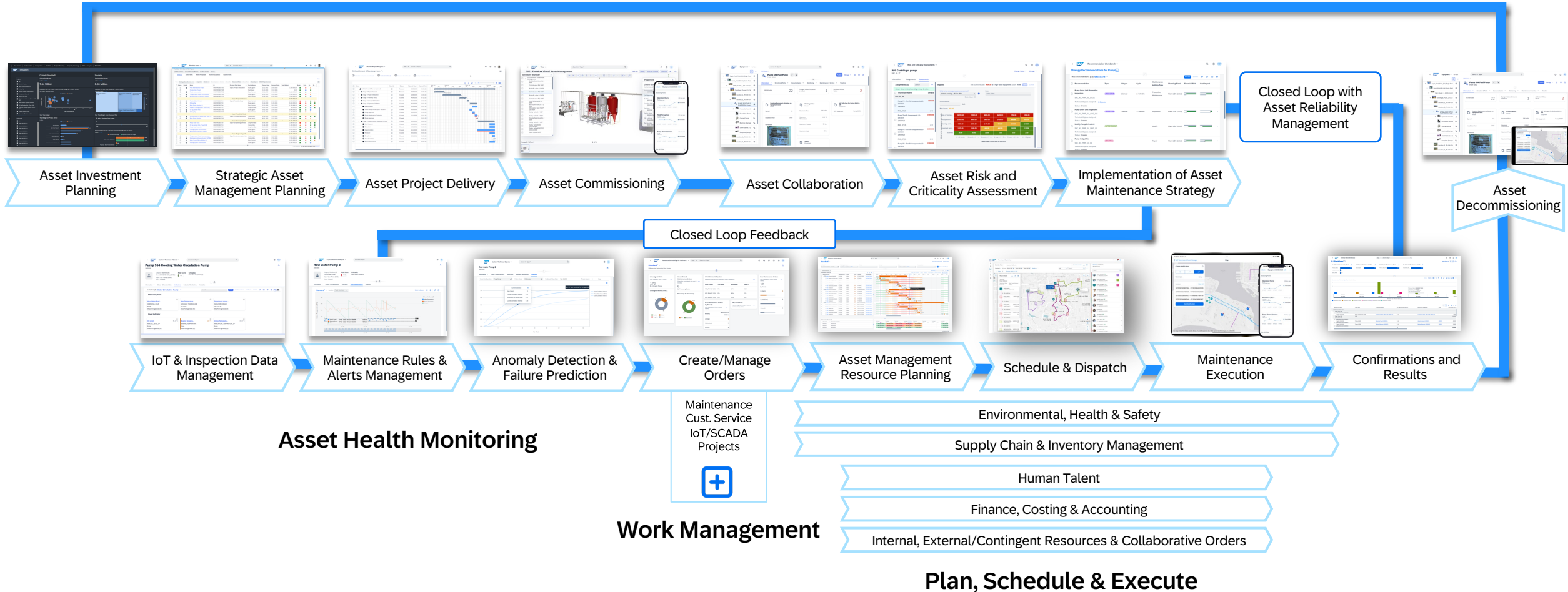




# Closed Loop Asset Life-Cycle Enabled by SAP S/4HANA Cloud

Investment to Commission

Reliability Assessment & Recommendation Management

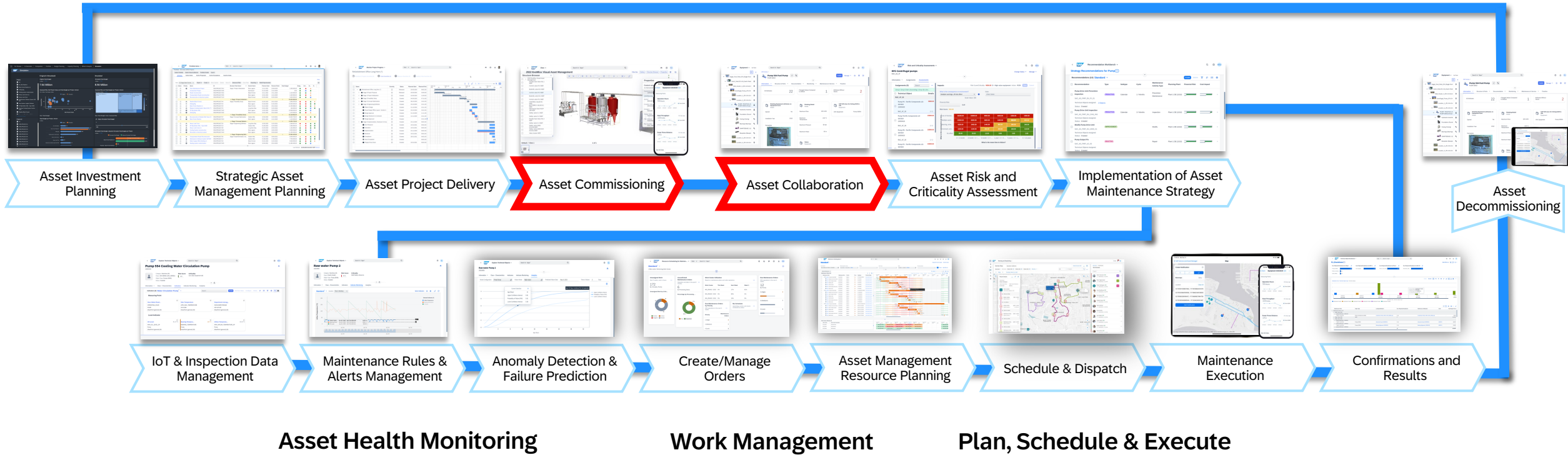




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# Share Asset Master Data (and Work Orders) with external parties

SAP Equipment

200 Series / **Pump 00554** ✓

PUMP 00554

Manufacturer: Pumps Ltd ID Link Shared By: 1 Partners Location: Location\_2\_(P1-C4-U3-A1-L2) External IDs Status: Published Languages: EN

Information Structure & Parts Documentation Monitoring Maintenance & Service Analytics ERP Information Timeline

### Highlights

Attribute Changes  
November 2022 - November 2024

By Month Highest: 4

Phase  
**Fully Operational**  
Dec 4, 2019

Previous Phase: Partially Operational  
Planned Next Phase: Sold  
Oct 24, 2021

Firmware Announcements  
Last Year

1 Mandatory  
Total: 19

### Data Sheet

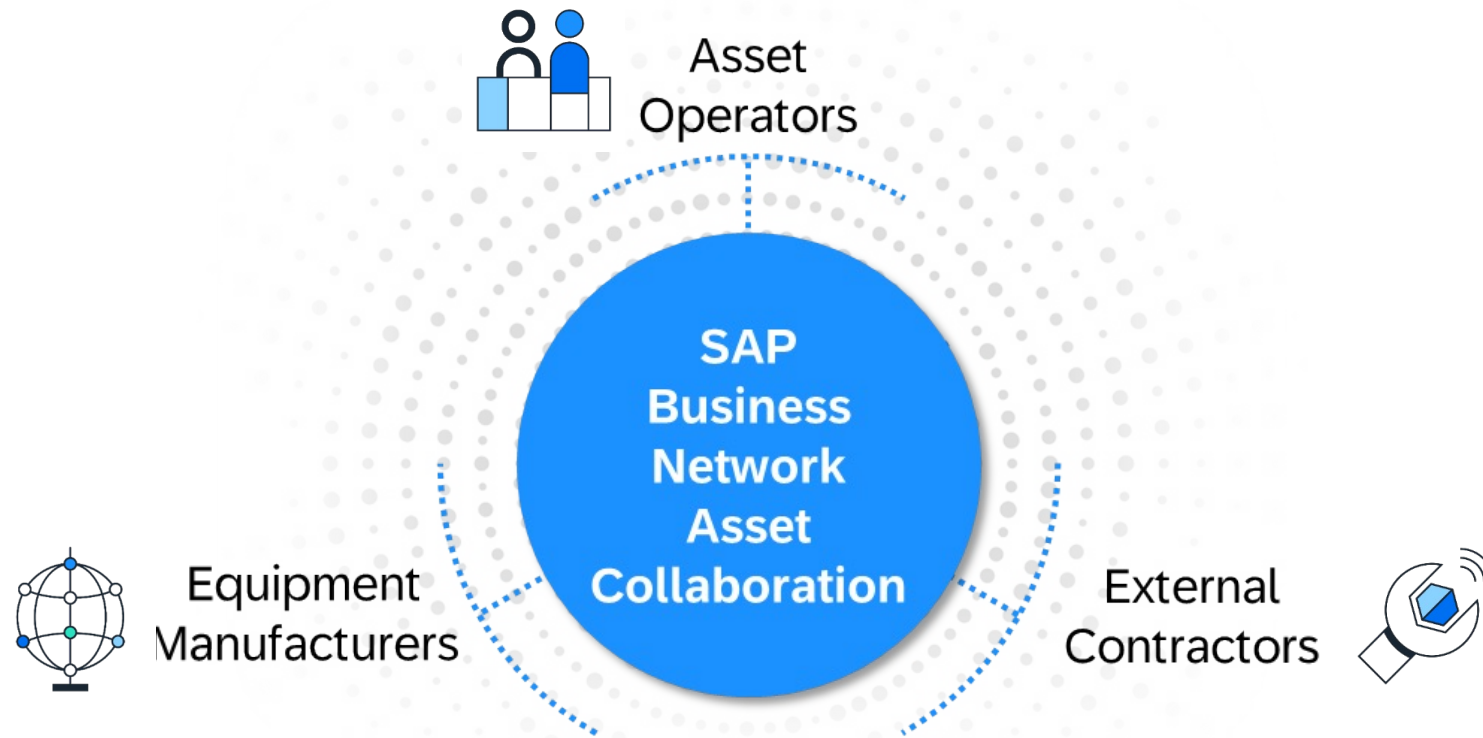
Show Details

All Attributes	30	Changed Values Compared to Default	1	Attributes Without Values	4
<b>Status</b> Equipment	Status: True	<b>MH0110_EQUI_1</b> Equipment	Date till reservation: Dec 23, 2021	<b>Pumps</b> Equipment	Next Inspection Date: Dec 11, 2023

# SAP Business Network Asset Collaboration

## Mission

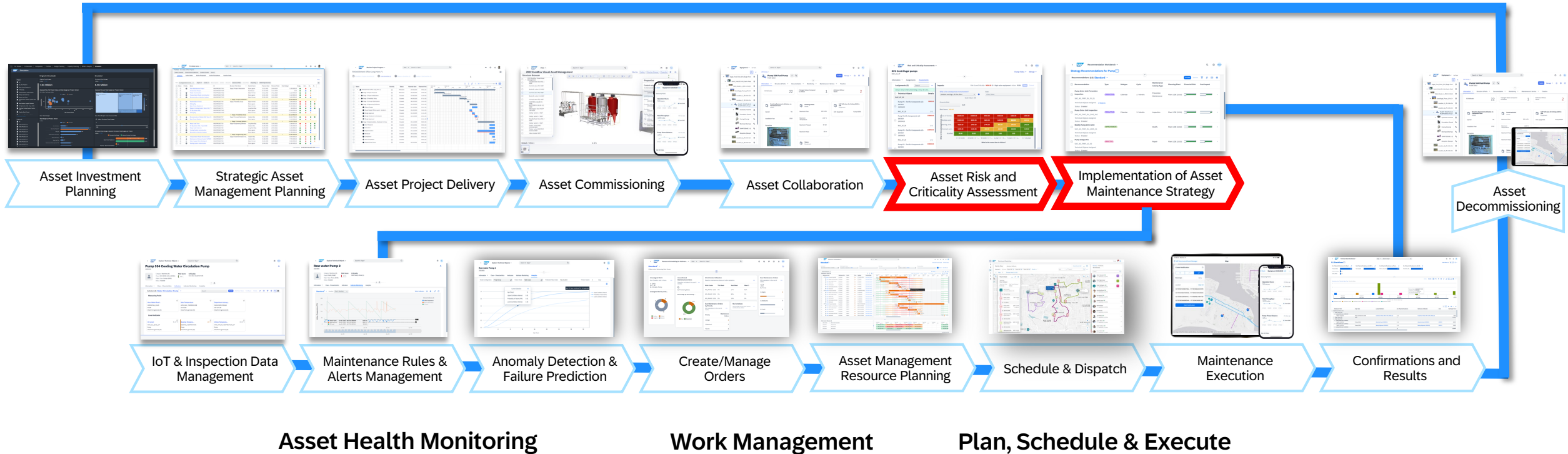
Connect trading partners to transform highly fragmented asset management practices into **unified and intelligent collaborative processes** breaking internal and external organizational silos




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# Re-using your SAP S/4HANA Master Data

 Explore Technical Objects ▼ 🔍 🗨️ 🔗 At

## Raw water Pump 2

20024005 🏠



Category: Machines (M)  
Class: PUMP (PUMP)  
Object Type: Pump (8038)

**Risk Score** 27.0 **Criticality** O&M Safety critical (A) **Status** Installed

⬆️ 🌟

**Information** ▼ **Class – Characteristics** **Indicators** **Indicator Monitoring** **Analytics**

### General Data

Category: Machines (M)	Material:	Acquisition Date:
Equipment: Raw water Pump 2 (20024005)	Serial Number:	Start-Up Date: Oct 18, 2022
Object Type: Pump (8038)		

### Structure

Superior Functional Location: Pump House (1111-PUP)	Technical Identification Number:
Superordinate Equipment:	Construction Type: ZS_100

### Manufacturer Data

# Performing a Risk & Criticality Assessment

< Manage Risk & Criticality Assessments ▾





 At

## R&C Assessment for Raw Water Pump

RAC\_AS\_58 Change Status ▾

Risk Type: Current Risk

Currency: United States Dollar (USD)

Valid To

Dec 30, 2024

Status

Released

⬆ ⬇ ⬆

Information ▾
Assignments
Assessments

**Assignments (1)**

Group: Group Order (Ascending), Group ... ✕

Technical Object	Details
<b>Risk_Criticality_Pump</b>	
Raw water Pump 2 20024005	<b>41.00</b>
<input checked="" type="radio"/> Risk_Criticality_Pump	2 / 2
Template Version: 1	

**Impacts** Risk Score/Criticality: **41.00** A - O&M Safety critical Action: RCM

Risk Details		
Impacts	Risk	Financial Risk
Health Safety	<b>9.00</b>	1,000.00 USD
Production	<b>32.00</b>	3,000.00 USD
<b>Overall</b>	<b>41.00</b>	<b>4,000.00 USD</b>

**Health Safety:** Health ⌵

**1. Severity**  
What would be the severity of a failure of this equipment

Description	Value	Long Text
<input type="radio"/> Violation	1	Violation
<input type="radio"/> Minor Injury	2	Minor Injury
<input checked="" type="radio"/> Serious Disability	3	Serious Disability

# Performing a Risk & Criticality Assessment

< Manage Risk & Criticality Assessments v

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❓
At

## R&C Assessment for Raw Water Pump

RAC\_AS\_58 Change Status v 📄

Risk Type: Current Risk

Currency: United States Dollar (USD)

**Valid To**

⚠️ Dec 30, 2024

**Status**

Released

^
★

Information v
Assignments
Assessments

**Assignments (1)**  🔍 ⋮

Group: Group Order (Ascending), Group ... ✕

Technical Object	Details
<b>Risk_Criticality_Pump</b>	
Raw water Pump 2 20024005	41.00
<input checked="" type="radio"/> Risk_Criticality_Pump Template Version: 1	2 / 2

**Impacts** Risk Score/Criticality: 41.00 A - O&M Safety critical Action: RCM

Note:

0/5000

	Frequent	4.00	8.00	12.00	16.00
	Probable	3.00	6.00	9.00	12.00
	Potential	2.00	4.00	6.00	8.00
	Unlikely	1.00	2.00	3.00	4.00
		Violation	Minor Injury	Serious Disability	Fatal

Severity

# Reliability Engineering – FMEA/RCM

< Manage FMEA Assessments v

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At

## Raw\_Water\_Pump\_FMEA

Raw\_Water\_Pump\_FMEA

↑
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Assessment v

### Hierarchy

- v Raw water Pump (20024005)
- v Case (1000)
- v Provide water flow (WFLW)
  - v Pump output less than 850 l/min (FF01)
    - v Failure to start on demand (FTS)
      - Breakdown (BRD)
      - Plugged/choked (PLU)
- v Impeller (1004)
  - v Failure to start on demand (FTS)

## Breakdown 🔗 ×

Code ID: BRD      Code Group Short Description: Max RPN  
 Code Group ID: ZSROPU2      Type 2 Failure mode for Pump

448

Maintenance (UT-PUMP)      6      5      240

1007

### Severity

Severity Details

Scale:

8 - Very High ❓

### Recommendations (1) ⚙️

	Recommendation	Type	Subtype	Cycle / UOM	MAT
<input type="checkbox"/>	Create a new PM	Proactive	Calendar	1 / Year	Preventive Maintenance (YB4) <span style="float: right;">&gt;</span>
	RCMD_AS56				
	Status: Created				

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# Creating and implementing recommendations

< **SAP** Manage Recommendations ▾


Search, Chat, Help, At

## Create a new PM

RCMD\_AS56


Type: Proactive  
Subtype: Calendar  
Technical Objects Assigned: [1 Object](#)  
Assessment: [Raw\\_Water\\_Pump\\_FMEA](#)  
Source Recommendation:  
Failure Data Profile: Failure Data for Pumps (IS-AD-PUP)

### Financial Risk

Current Risk	5000
 4700	
Remaining Risk	300

USD

### Cost Impact

Estimated Maintenance Savin...	1000
 500	
Estimated Cost	500

USD

Status: Created

Change Status ▾ Manage ▾

Information ▾ Failure Data Technical Objects

### General Data

[Edit](#)

Description: Create a new PM	Type: Proactive	Maintenance Activity Type: Preventive Maintenance (YB4)
Long Description: Create a new PM	Subtype: Calendar	Priority: 2-High (2) / PM
	Cycle: 1 Year	Discipline: Mechanical
		Impact On Business: Unit Shutdown

<b>Classification</b>	<b>Organizational Data</b>
Failure Data Profile:	Planning Plant:

# From Maintenance Strategy to Execution

## Core Pillar in SAP's IAM Suite – Business Capability orchestrated via Business Activity

### Strategy for Maintenance Strategy to Execution

Transform Asset Management by seamlessly extending Enterprise Asset Management with Asset Performance Management along end-to-end processes to close the loop between maintenance strategy and execution to define, implement, execute and monitor the optimal asset maintenance.

#### 4 – Plan Asset Maintenance Task and Resources

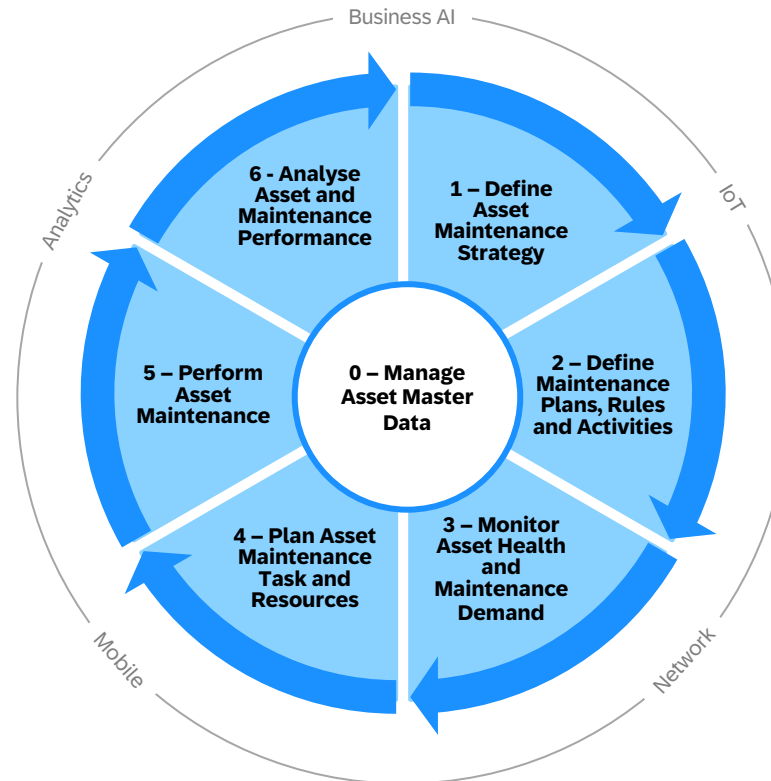
- Asset Management Resource Planning (operational) *connected:*
- Tactical Asset Management Planning
- Strategic Asset Management Planning

#### 5 – Perform Asset Maintenance

- Maintenance Execution
- Asset Fault and Incident Response Management

#### 6 – Analyze Asset and Maintenance Performance

- Asset Performance Analysis
- Asset Costing and Valuation



#### 0 – Manage Asset Master Data

- Asset Data and Information Management
- Asset Information Standards Definition

#### 1 – Define Asset Maintenance Strategy

- Asset Risk Assessment
- Asset Reliability Engineering

#### 2 – Define Maintenance Plans, Rules and Activities

- Tactical Asset Management Planning

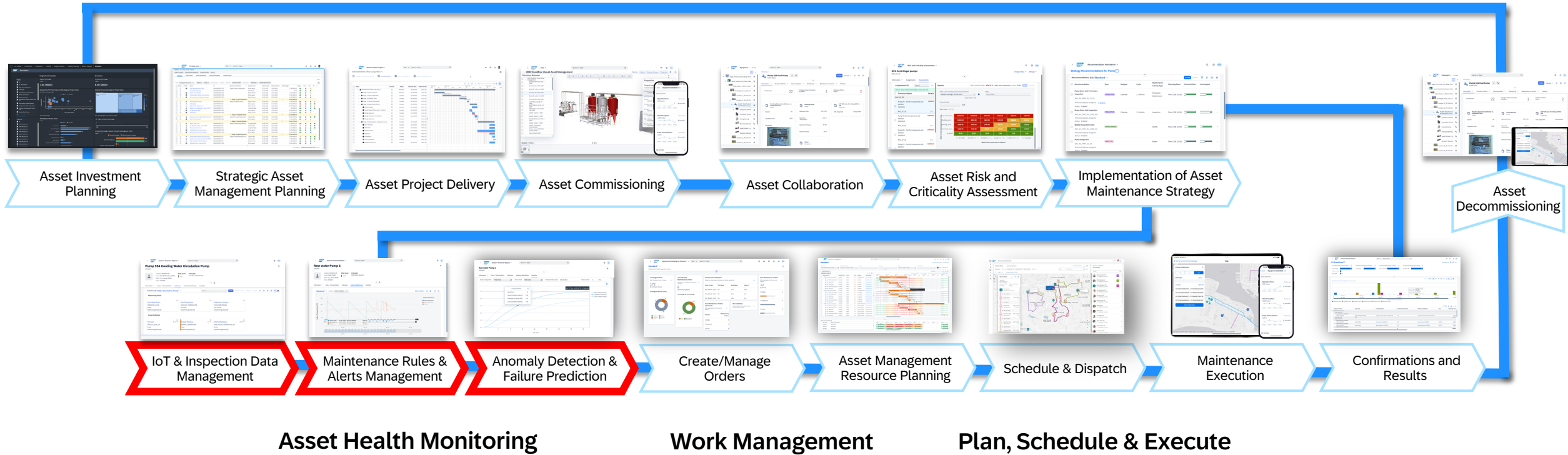
#### 3 – Monitor Asset Health and Maintenance Demand

- Asset Health Monitoring
- Asset Fault and Incident Response Management

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# IoT Data Management

The screenshot displays the SAP IoT Data Management interface for a technical object. At the top, the SAP logo and 'Explore Technical Objects' are visible. The main title is 'Raw water Pump 2' with ID '20024005'. Below this, a card shows the object's classification: 'Category: Machines (M)', 'Class: PUMP (PUMP)', and 'Object Type: Pump (8038)'. To the right, key metrics are shown: 'Risk Score' (27.0), 'Criticality' (O&M Safety critical (A)), and 'Status' (Installed). A navigation bar includes 'Information', 'Class - Characteristics', 'Indicators' (selected), 'Indicator Monitoring', and 'Analytics'. The 'Indicators' section shows a list of 5 indicators, with 'Standard' selected. A search bar and action buttons like 'Create', 'Add New Value', 'Configure', and 'Delete' are present. The indicators listed are: 'Bearing Temp...' (120.01 °C), 'OUTLET PRE...' (OUTLET PRESSURE), 'Oil Level' (91.17 %), 'Inflow Temp...' (33.33 °C), and 'Hour Meter ...' (OPERATING\_HOUR). Each indicator card includes its technical ID and 'MeasPoint (general) (M)'.

**Raw water Pump 2**  
20024005

Category: Machines (M)  
Class: PUMP (PUMP)  
Object Type: Pump (8038)

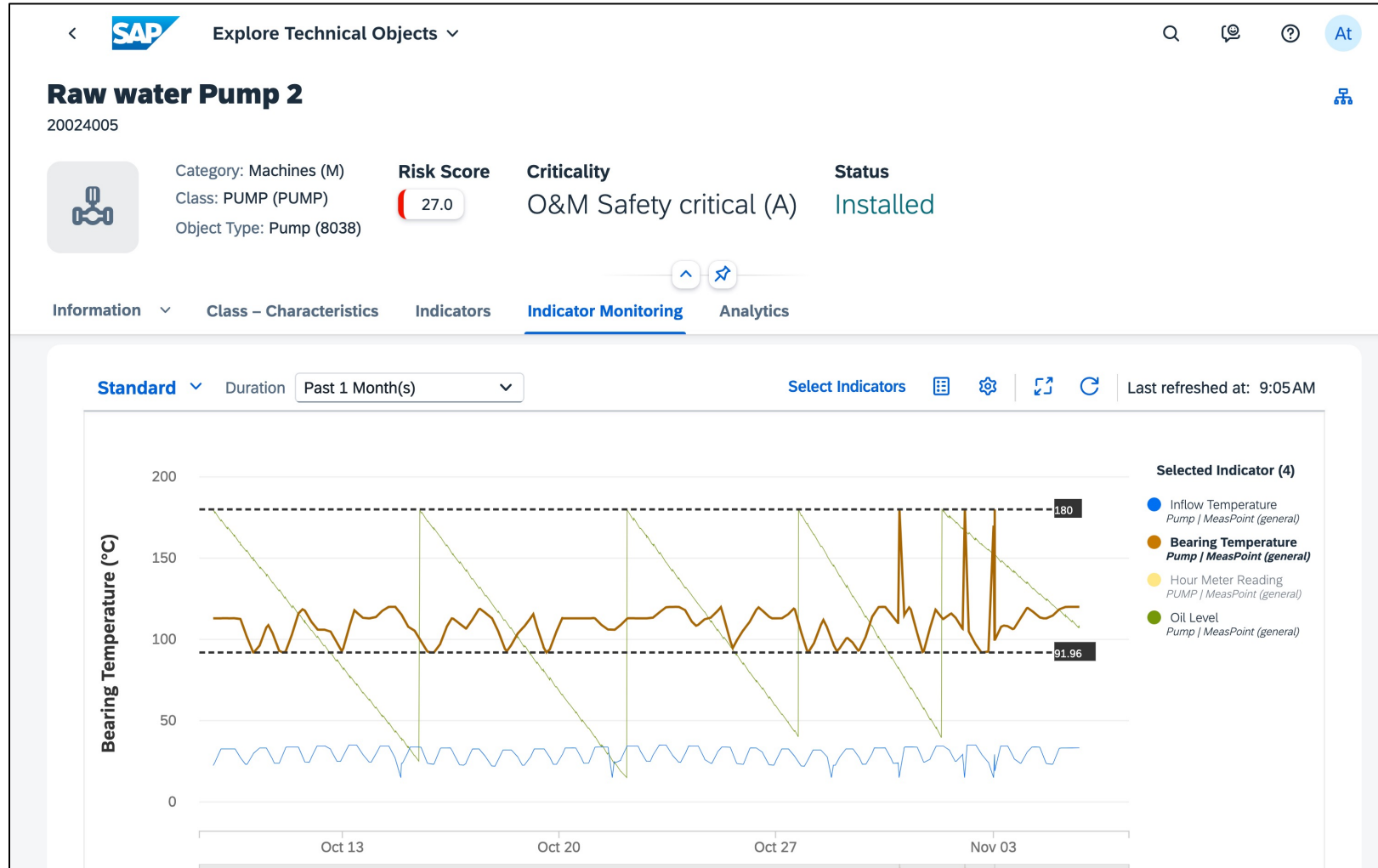
**Risk Score** 27.0  
**Criticality** O&M Safety critical (A)  
**Status** Installed

Information ▾ Class – Characteristics **Indicators** Indicator Monitoring Analytics

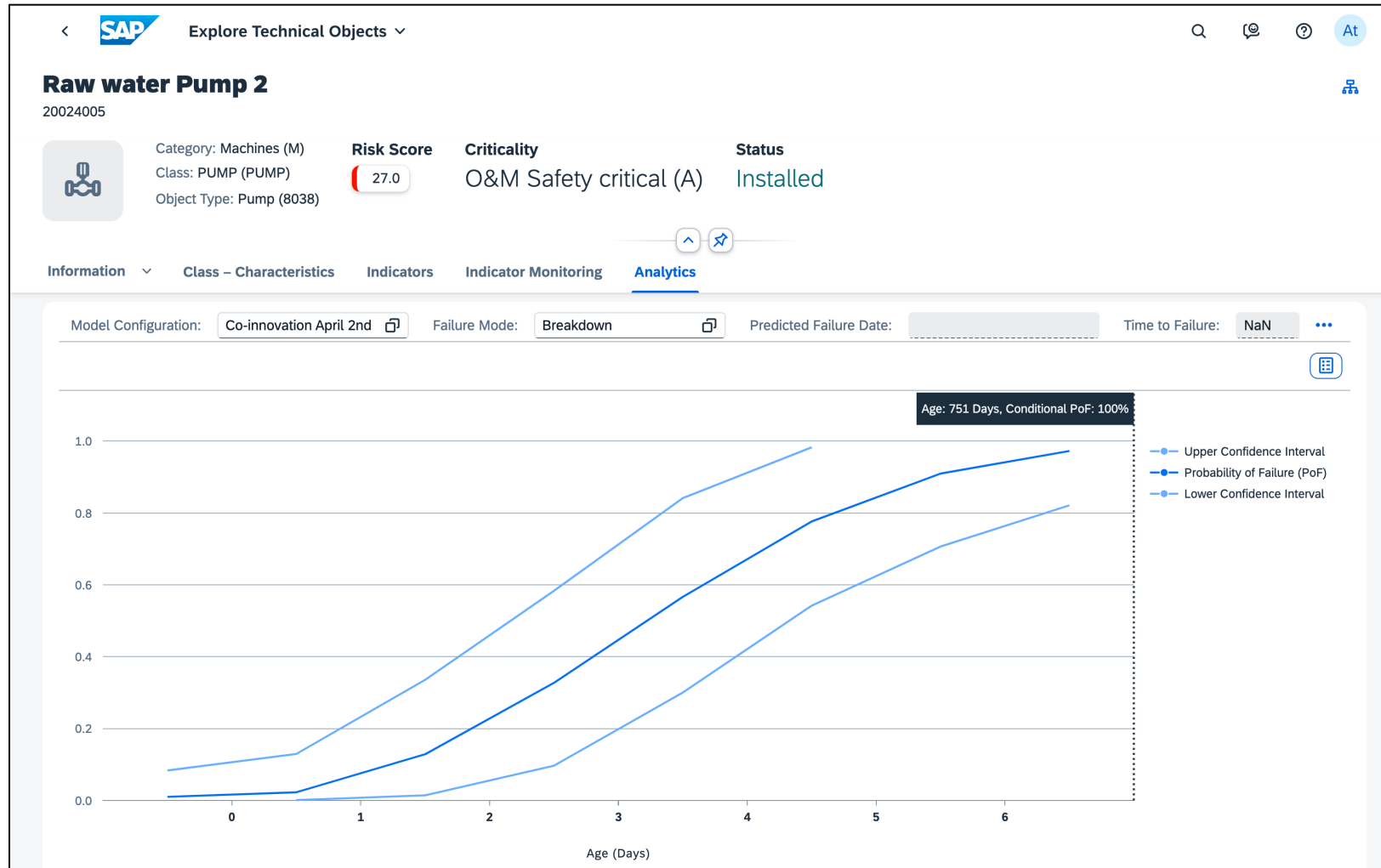
Indicators (5) Standard ▾ Search [Q] Create Add New Value Configure Delete ↓↑ [≡] Last refreshed at: 9:05 AM ⋮

- Bearing Temp...** 120.01 °C  
APM\_BEARING\_TEMPERATURE\_SP  
Pump  
MeasPoint (general) (M)
- OUTLET PRE...** ☆  
AM\_OUTLET\_PRESSURE  
OUTLET PRESSURE  
MeasPoint (general) (M)
- Oil Level** 91.17 % ☆  
APM\_OIL\_LEVEL\_SP  
Pump  
MeasPoint (general) (M)
- Inflow Temp...** 33.33 °C ☆  
APM\_INFLOW\_TEMPERATURE\_SP  
Pump  
MeasPoint (general) (M)
- Hour Meter ...** ☆  
OPERATING\_HOUR  
PUMP  
MeasPoint (general) (M)

# Maintenance Rules & Alerts Management, Anomaly Detection



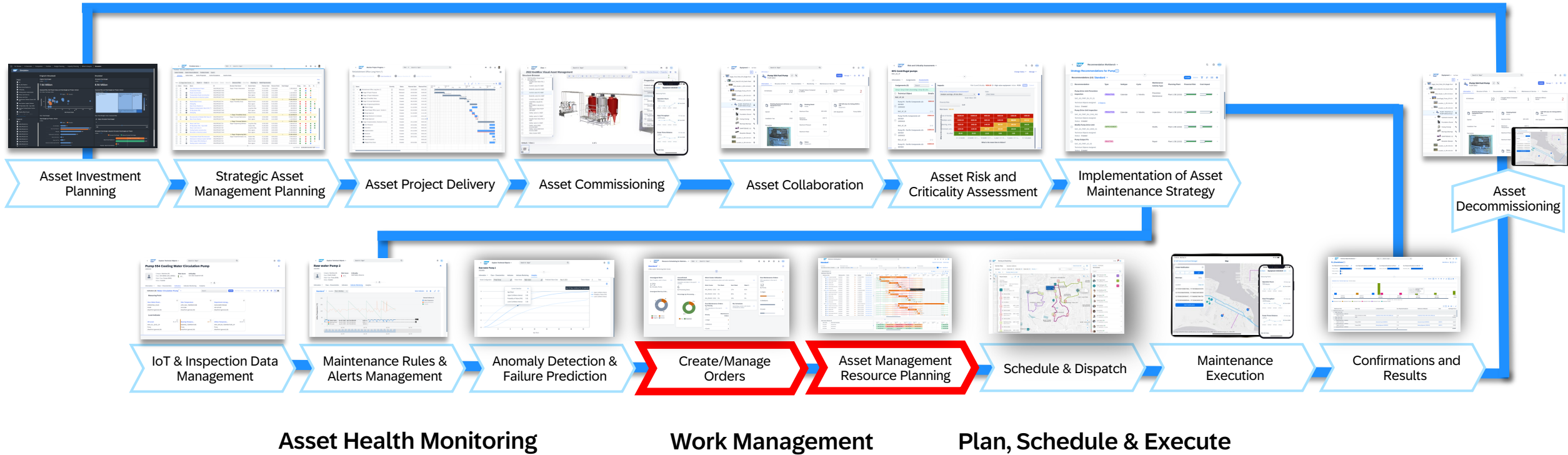
# Failure Curve Analytics & Anomaly Detection



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# Balancing Maintenance Demand & Capacity

<
Manage Work Center Utilization v

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🔊
❓
🔔
1
JE

**Standard** v
Change Work Center Capacity My Work Centers

3 filters active: Time Period, Performing Work Center, Performing Work Center Plant

Maintenance Orders (16)
Maintenance Order Operations (42)

Add to Schedule
Change
Dispatch
Cancel Dispatch
Show Corresponding Orders
📄
☰
☰
⋮

Order	Operation
<input type="checkbox"/> <b>4000498</b> demo E2E reactive 0110 Suboperation: Operation Planned Start: 11/24/2024, 10:00:00 PM Operation Planned End: 11/25/2024, 12:07:30 AM Processing Status: <span style="color: #c00000;">Due</span> Work: 4.000 H Performing Work Center: RES-0100	Check the pump (0010)
<input type="checkbox"/> <b>4000498</b> demo E2E reactive 0110 Suboperation: Operation Planned Start: 11/25/2024, 12:07:30 AM Operation Planned End: 11/25/2024, 05:26:15 AM Processing Status: <span style="color: #c00000;">Due</span> Work: 5.000 H Performing Work Center: RES-0100	Check the Bearings (0020)

Work Center v
2 Items v
⏪
⋮

### 2 Work Centers (11/07/2024 - 12/01/2...

Calendar Week	AMS-100 (%)	RES-0100 (%)	Target (%)
45	50	10	75
46	25	55	75
47	20	10	75
48	15	25	75

Open My Schedules



# Refining & releasing a detailed schedule

SAP Manage Schedules

## CW\_46\_47\_Mechanics

Show Activity Log | Open My Schedules

Details  
 Time Period: 11/11/2024 - 11/22/2024  
 Reviewers: Jason Enti

Status Scoping  Use Optimized Data Access

List View Graphical View

Maintenance Order	Mainte...	Priority	Proces...	November 2024
4000781 Ins	RES-0...	2-High	Dispatched	04:00:00 PM - 4000781 Install Kit
0010 Shu	RES-0...	2-High	Dispatched	RES-0100 11/15/2024, 12:07:30 AM
0020 Cle	RES-0...	2-High	Dispatched	RES-0100 11/15/2024, 03:18:45 AM
0030 Inst	RES-0...	2-High	Dispatched	RES-0100 11/15/2024, 06:30:00 AM
0040 Star	RES-0...	2-High	Dispatched	RES-0100 11/17/2024, 11:03:45 PM
4000784 Oil	RES-0...	2-High	Dispatched	04:00:00 PM - 4000784 Oil pooling under pump
0010 Che	RES-0...	2-High	Dispatched	RES-0100 11/14/2024, 02:15:00 AM
0020 Rep	RES-0...	2-High	Dispatched	RES-0100 11/14/2024, 11:03:45 PM
0030 Insp	RES-0...	2-High	Dispatched	RES-0100 11/15/2024, 05:26:15 AM
4000790 Qu	RES-0...	3-Medi...	Dispatched	4000790 Quarterly Inspection
0010 Che	RES-0...	3-Medi...	Dispatched	100 11/12/2024, 12:39:22 AM
0020 Che	RES-0...	3-Medi...	Dispatched	RES-0100 11/15/2024, 02:48:45 AM
4000803 Ve	RES-0...	2-High	Dispatched	4000803 Vessel Inspection 2
0010 Shu	RES-0...	2-High	Dispatched	RES-0100 11/14/2024, 11:03:45 PM
0020 Cle	RES-0...	2-High	Dispatched	RES-0100 11/15/2024, 04:22:30 AM
4000845 Oil	RES-0...	2-High	Scheduled	10:00:00 PM - 4000845 Oil pooling under pump
0010 Ider	RES-0...	2-High	Scheduled	11/11/2024, 04:15:00 AM

# Closed Loop Asset Life-Cycle Enabled by SAP S/4HANA Cloud

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# The Chocolate Factory is expanding to your local supermarkets...



# Scheduling & Dispatching of Technician

The screenshot displays the SAP Planning and Dispatching interface. The main window is titled "Service Map" and shows a map of a region with a yellow highlighted area. A route is plotted on the map, starting from a home icon and passing through several locations. A pop-up box on the map indicates a total travel time of 0 h 22 min and a total travel distance of 10.14 km. The interface includes a sidebar on the left with navigation icons, a top navigation bar with the SAP logo and "Planning and Dispatching" dropdown, and a right sidebar with "Overview / Regions" and a list of regions.

**Service Map**

Service Call Priority (1) x Equipment Name (1) x Status (1) x Filter By Location Search

Today Tuesday, July 16, 2024

**Route Details**

Technician:  
Raul Johns

Total Travel Time: 0 h 22 min  
Total Travel Distance: 10.14 km

Start Location  
175, Eastwood Ave, Westervill...

0 h 2 min, 0.69 km

8:05 AM - 10:05 AM  
Smart Solutio... 2 h

0 h 10 min, 4.76 km

10:50 AM - 11:35 AM  
Smart Solutio... 45 min

0 h 2 min, 1.16 km

12:30 PM - 2:30 PM

**Regions**

Search

- North America
- Mechanical
- Electrical
- USA
  - Ohio
    - Columbus
    - Westerville
    - Cleveland
  - 1010

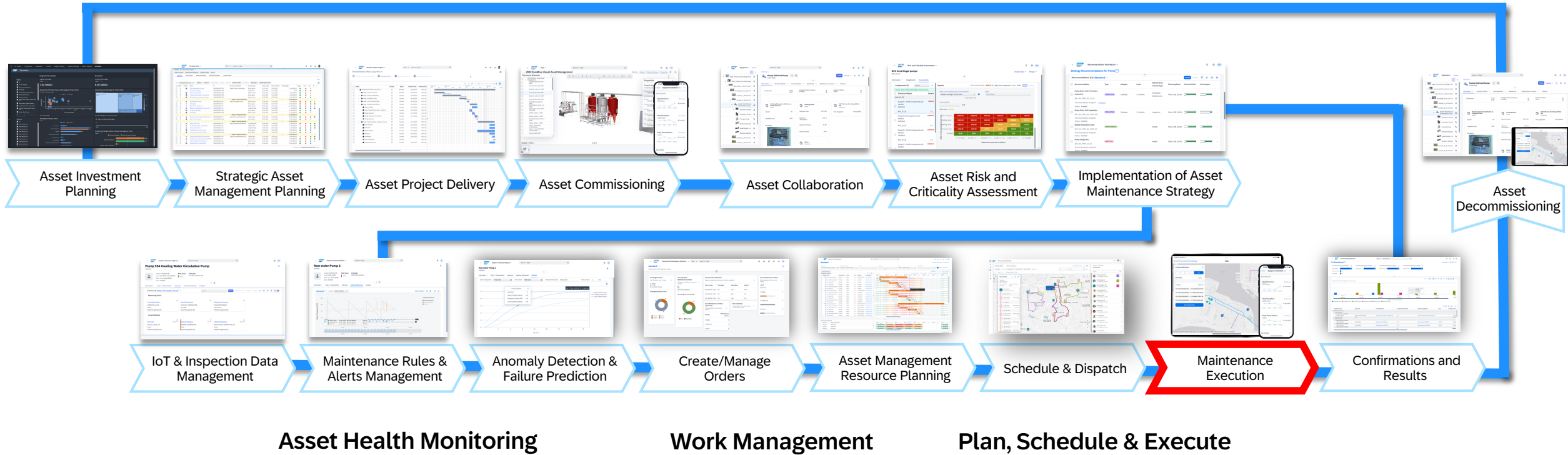
# Service Management from SAP Delivering a **Unified Service Resolution**



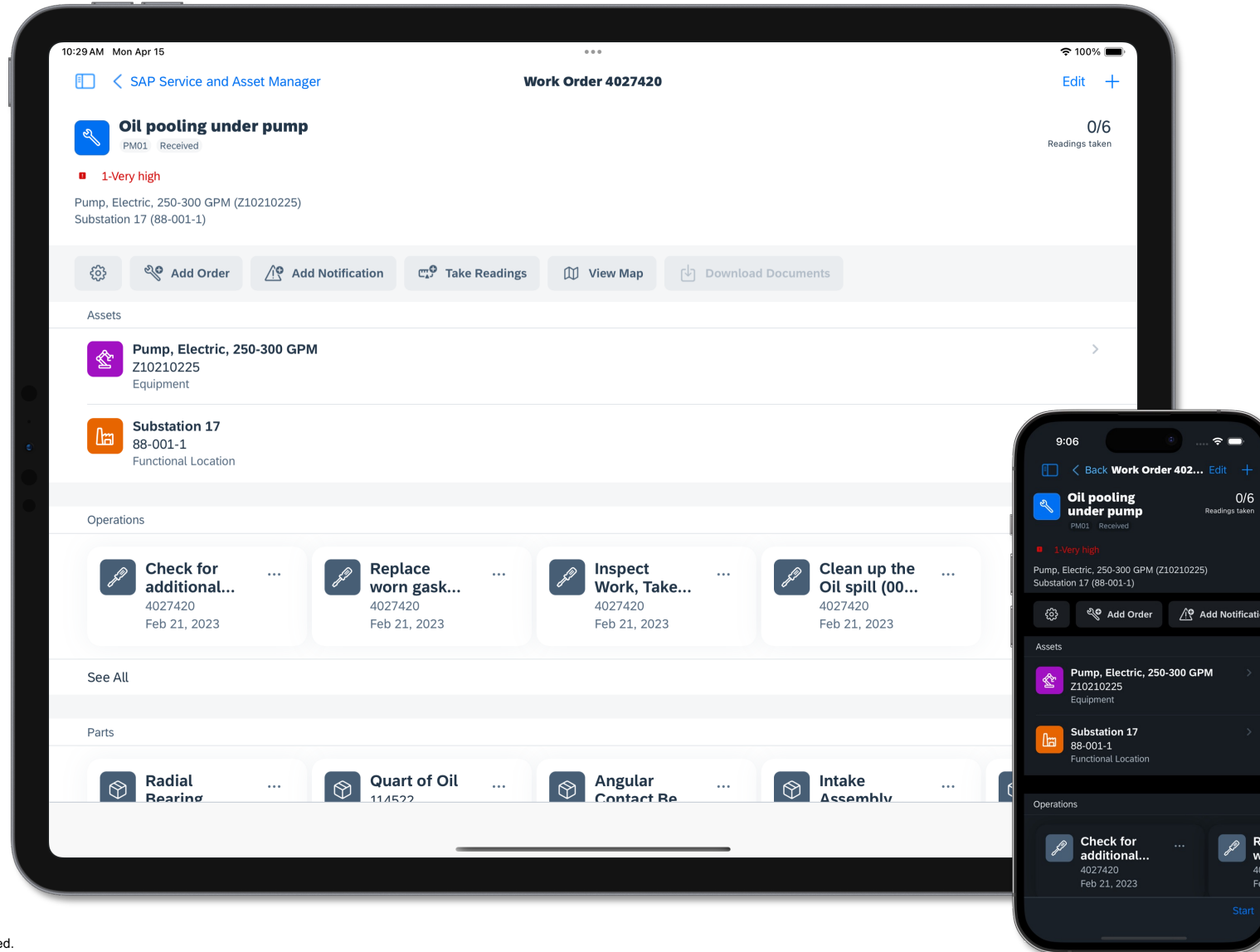
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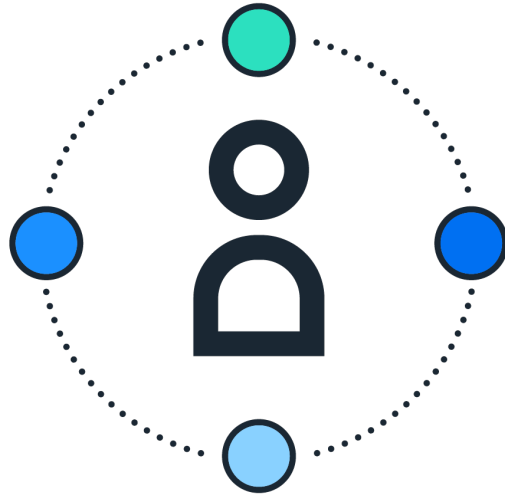
Reliability Assessment & Recommendation Management



# Mobile Execution of Maintenance

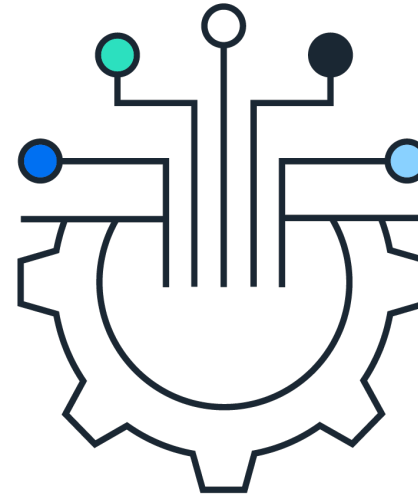


## SAP S/4HANA in your technician's pocket



### Harmonized person-centric approach

Leverage SAP Service and Asset Manager as mobile platform enabling ERP business processes. Mobile personas unlock a set of mobile features and capabilities to drive workforce productivity



### Seamlessly integrated mobile processes

Native integration with SAP enterprise systems (SAP ERP and S/4HANA) facilitating an efficient task execution and communication between the field and back-office



### Easy configuration

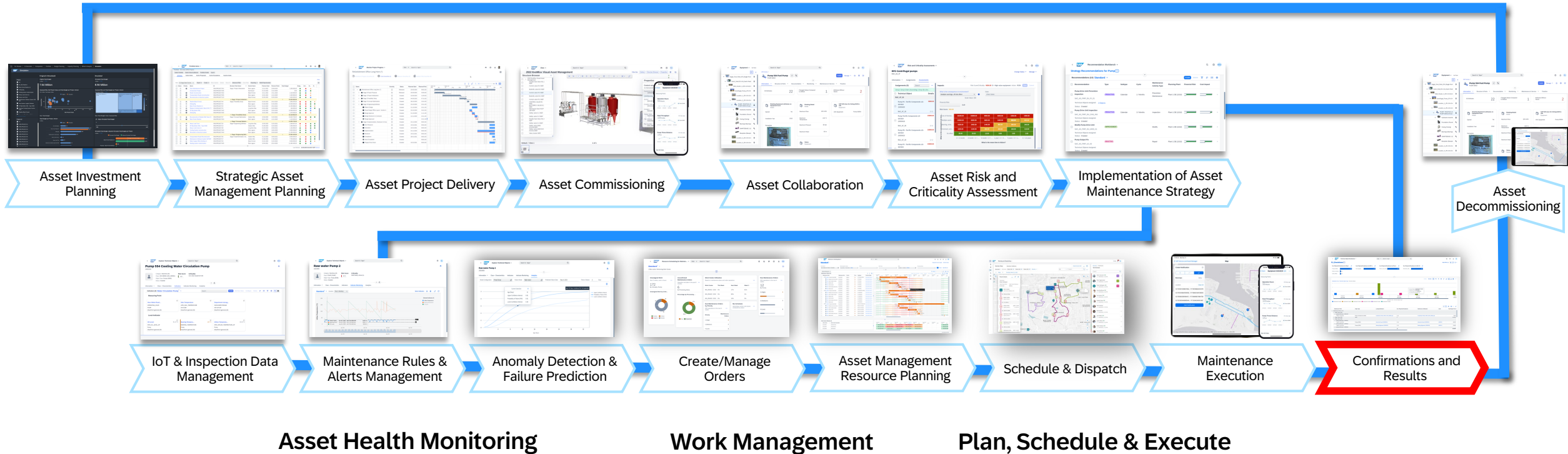
In a cloud-based editor leveraging SAP Business Technology Platform Mobile Services and Mobile Development Kit. Ready-to-use and extensible application available on iOS, Android and Windows



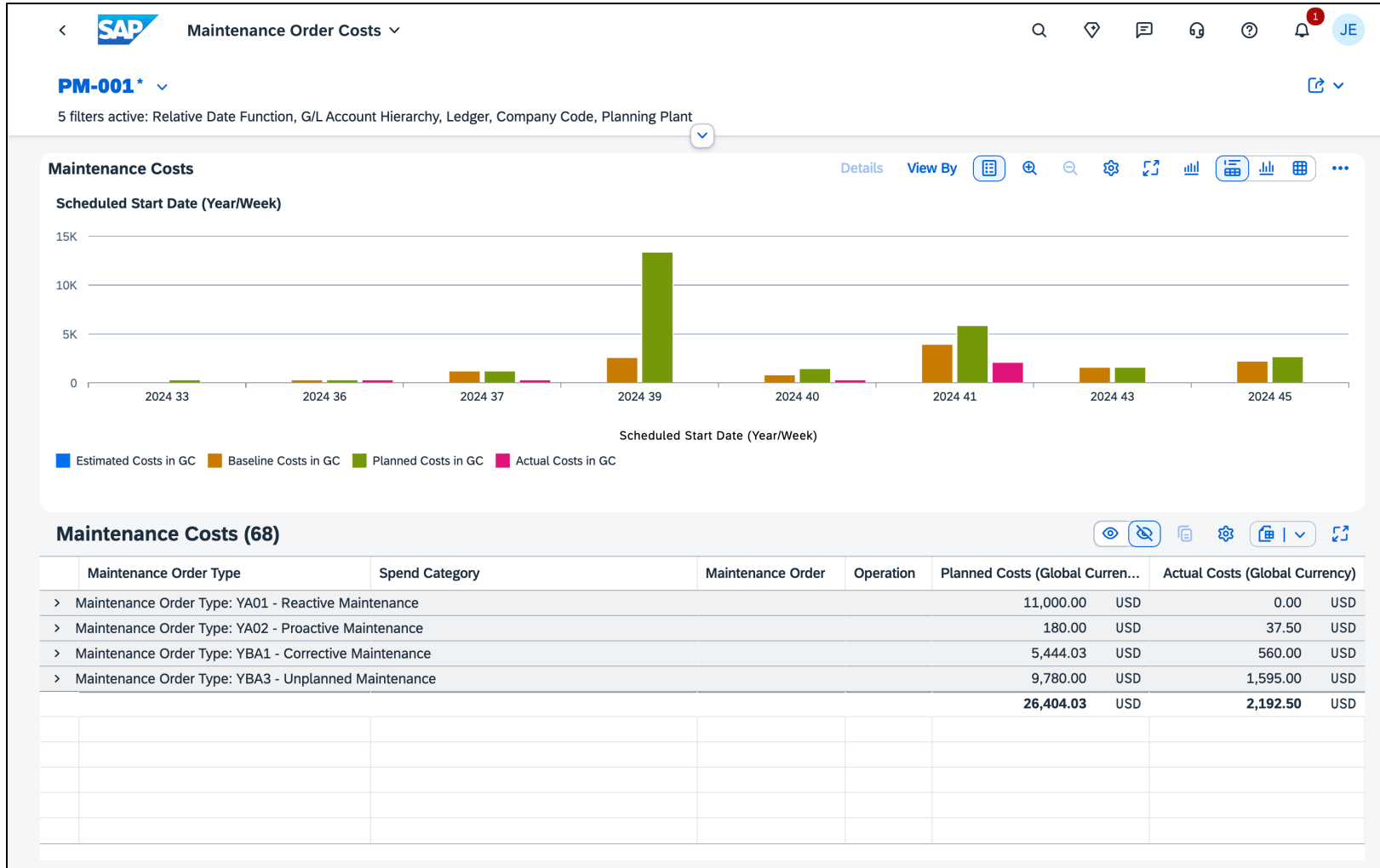
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# Embedded, out-of-the-box analytics in SAP S/4HANA



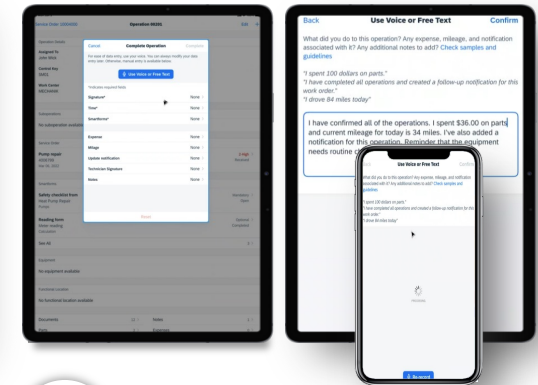
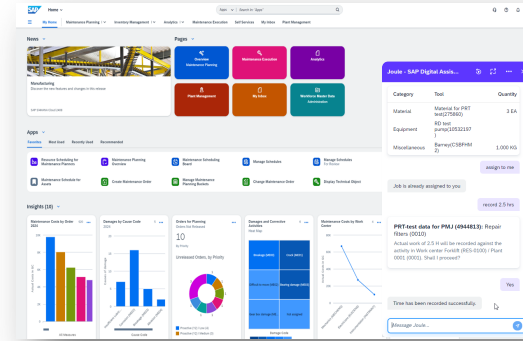
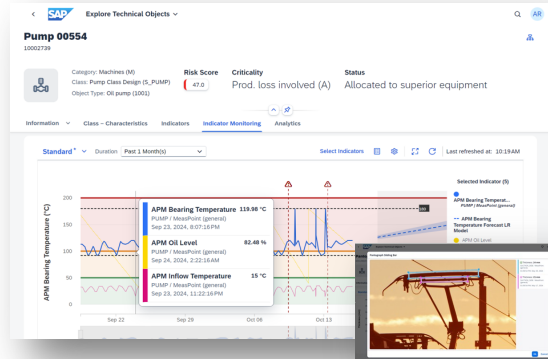
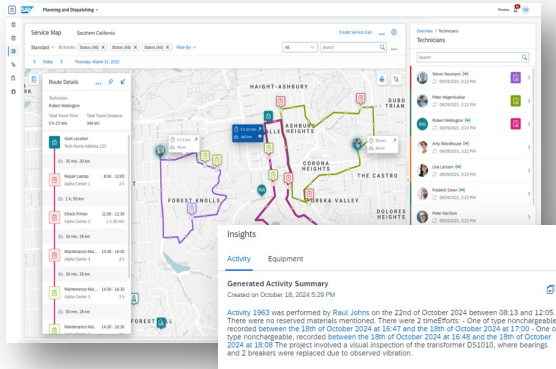
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# Artificial Intelligence in DSC Operate – Current and Planned Scenarios



## SAP Field Service Management

- AI-based scheduling
- Predictive routing
- Intelligent filtering and natural language search
- Job prediction duration
- Equipment insights
- Activity summary
- AI based assistance for screen configurations\*
- Generative AI for Admin\*
- Simulate and compare changes in scheduling policies\*

## SAP Asset Performance Management

- Estimate time to failure and probability of failure based on Weibull analysis
- Detect anomalies and create alerts
- AI enabled visual inspection for condition monitoring (beta)
- Custom AI models and algorithms\*
- Intelligent support for assessments and smart recommendations\*

## SAP S/4HANA Cloud Asset Management

- Schedule orders/operations automatically
- Intelligent maintenance order recommendation\*
- Smart work order completion using text mining to propose object part and damage codes\*
- Predict schedule attainment\*

## SAP Mobile Execution & Dynamic Forms

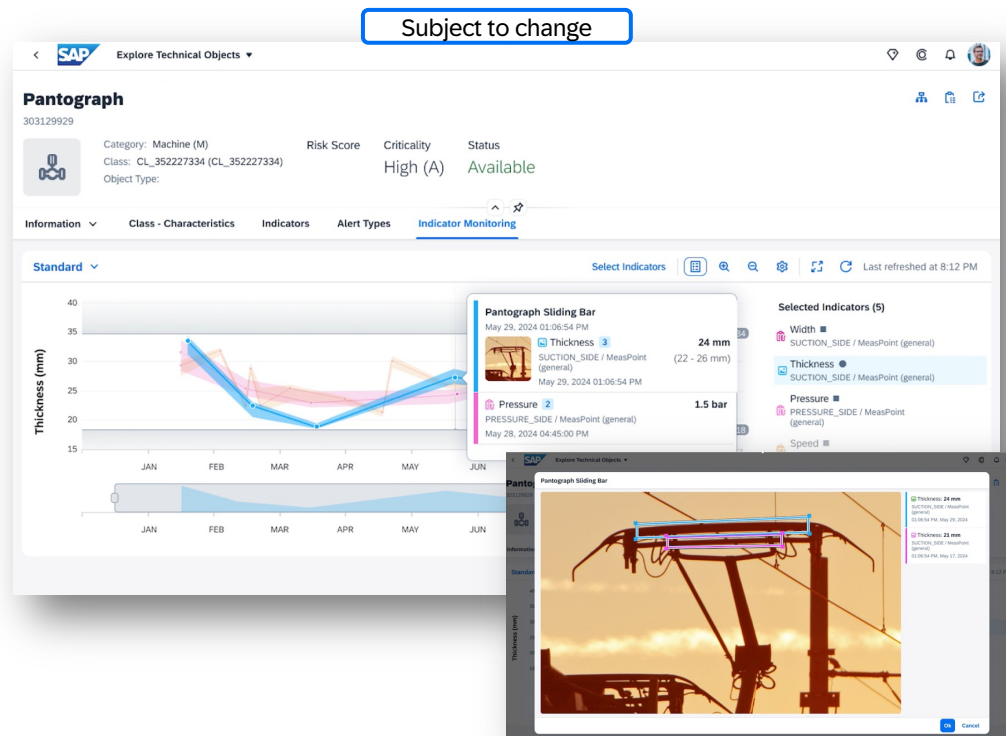
- AI driven maintenance execution: \*
  - Voice recognition and voice to text functionality\*
  - Completion work screen\*
- Incorporating Joule Assistant\*(FSM)
- AI-assisted browsing of knowledge bases\*(FSM)
- Voice recognition and voice to text functionality\*(FSM)
- Equipment & activity summary report\*(FSM)
- Incorporating Joule Assistant\*(FSM)
- AI generated report indicating state of equipment (FSM)

## Joule Assistant

# AI enabled visual inspection for condition monitoring

## Roadmap Highlights for SAP Asset Performance Management

Increased equipment health through computer vision and machine learning optimizes maintenance processes.



### CHALLENGE

Many organizations rely on planned maintenance and lack the ability to predict when equipment issues occur which leads to costly equipment downtime and higher maintenance costs.

### SOLUTION

#### SAP Asset Performance Management

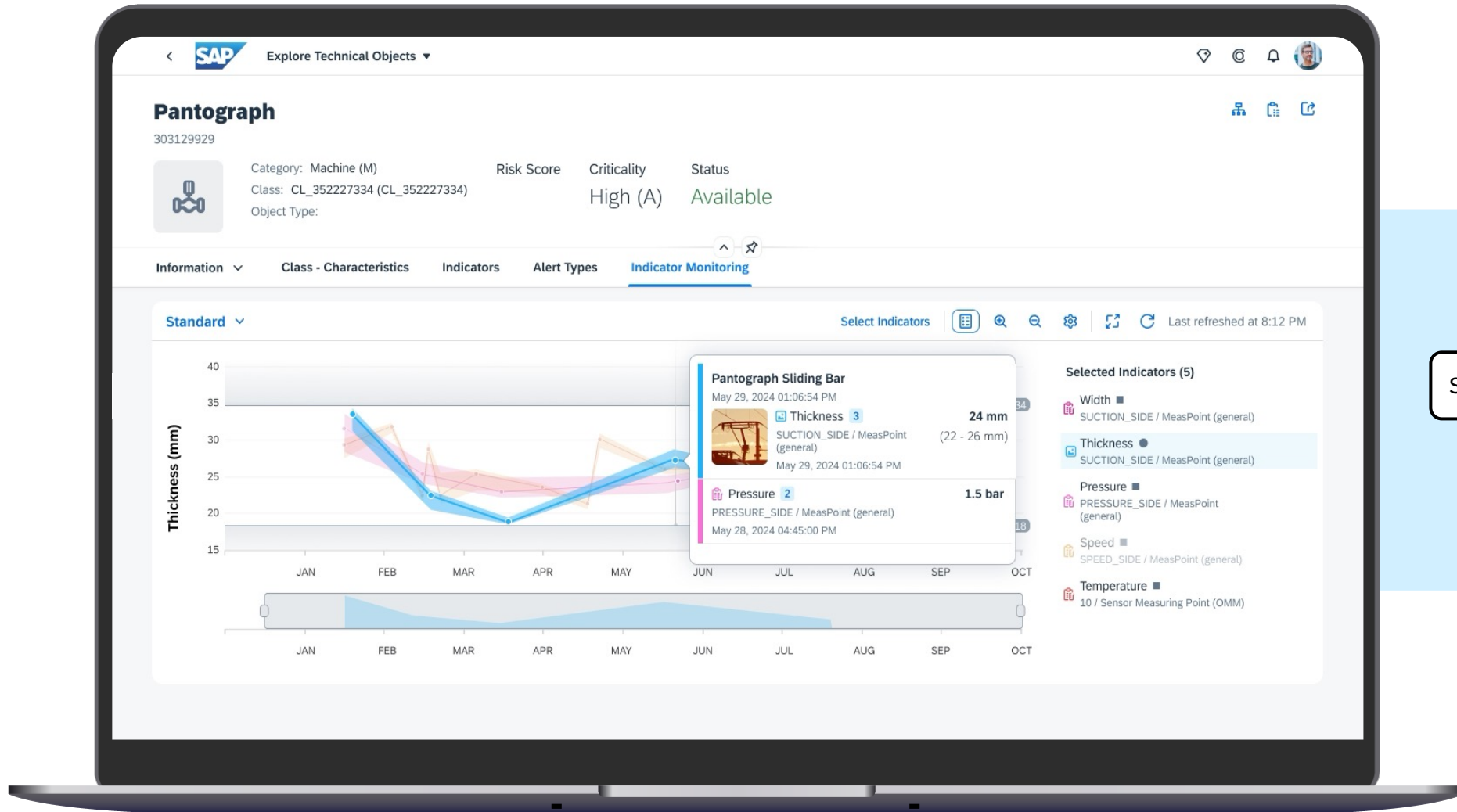
- Use of fixed installed cameras to capture images from component.
- Computer vision automates processing of images and estimates remaining useful life and detects anomalies.
- Use qualified ML models for condition-based maintenance to trigger needed maintenance activities.

### OUTCOMES

- Transform from time-based maintenance to condition-based maintenance strategies to safeguard operations of critical equipment with less out of service times.
- Efficiency and effective gains in overall maintenance program.

This presentation and SAP's strategy and possible future developments are subject to change and may be changed by SAP at any time for any reason without notice.

# AI enabled visual inspection for condition monitoring



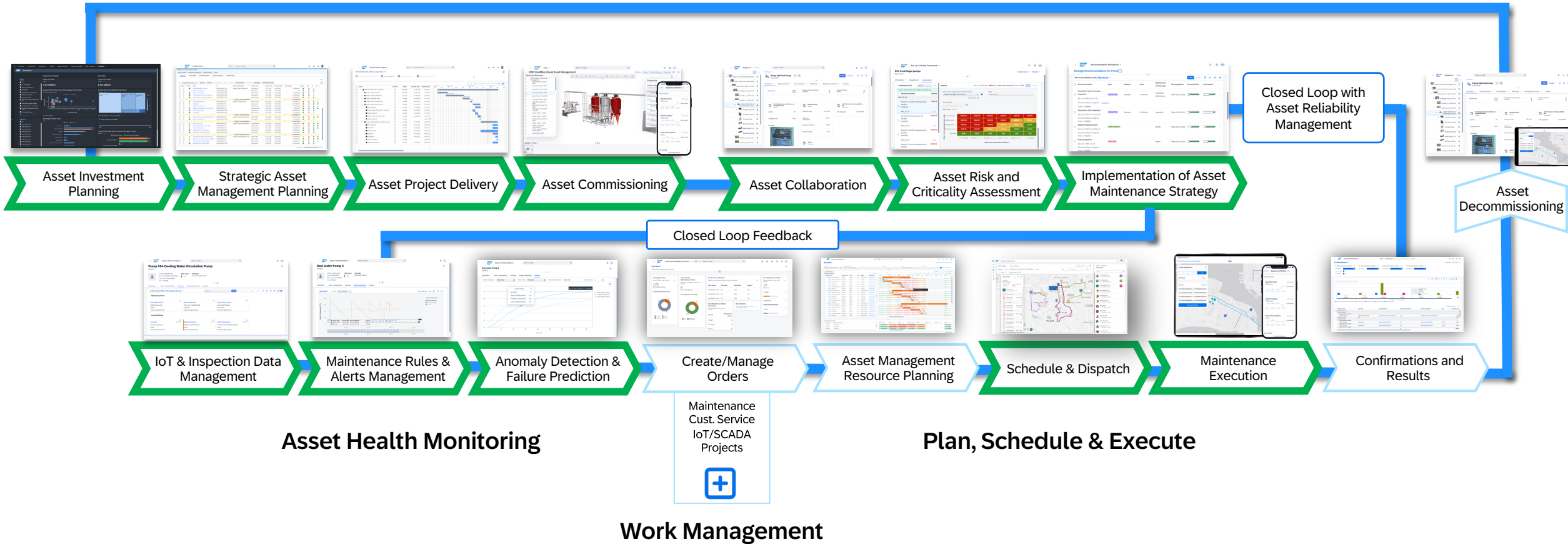
Subject to change

[\(Link to video\)](#)

# Closed Loop Asset Life-Cycle Enabled by SAP S/4HANA Cloud

Investment to Commission

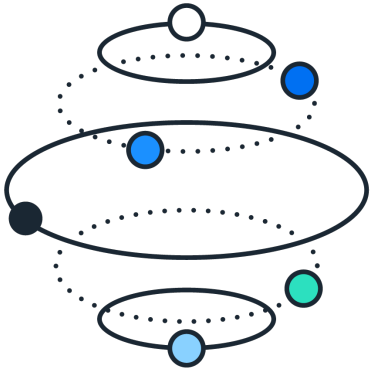
Reliability Assessment & Recommendation Management



# Key takeaways and call to action

Bring out your best in Asset & Service Management

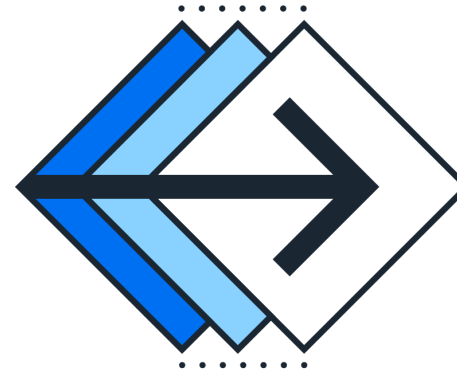
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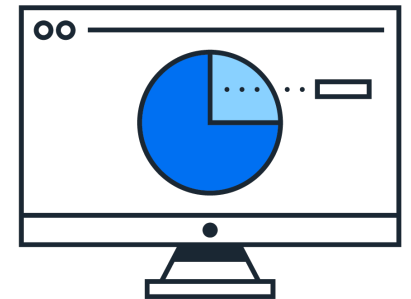
SAP Asset & Service Management has the **perfect domain for AI capabilities** – take advantage of infused AI now!



We **close the loop between maintenance strategy & execution** so you can continuously improve your maintenance & service programs.



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# Thank You!

Q&A

Feel free to reach out!

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