Data Hub anstatt Data Lake
Digital Twin in OPs-TIMAL

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Aerospace & Defense: Analytics Enabled Airline - Co-Innovation & Research

Use Case

Holistic optimization of airline operation by connection all relevant stakeholders

- with SAP Data Hub
- and predict maintenance issues using
- SAP Predictive Maintenance and Service

Optimizing data orchestration for MRO
(Co-Innovation & Research Programme)

Background:
Since 1995, the German Federal Government has promoted the research and technology development in the "LuFo" aviation research programme. The main focus of the current, fifth, edition of the programme includes strengthening the sector as a lead market for Industrie 4.0, and developing new digital products.

Objective:
The goal is to enable aircraft manufacturers, operators and suppliers to operate more efficiently, thereby increasing the efficiency of global aviation.

Status:
• Prototype of data orchestration platform: Partner systems connected to SAP Data Hub & 1st data orchestration realized
• Prototype of decision making system for maintenance scenario
• Presentations at external industry events
Challenge statement

Question of data sovereignty

- Today’s situation: OEMs create their own data platform try to get all other stakeholders on their platform to get more insights and to realize the digital twin and digital thread.

- Challenge: collaboration versus competition and getting the most value out of the available data.

- This challenge is also part of the OPs-TIMAL project.
The story behind: **Digital Twin**

The more data is available on an entity or a thing, the more complete and powerful the Digital Twin gets.
The **digital twin** needs to cover the entire life-cycle

**Closed loop engineering**

- Cost
- Stress simulations
- Geometries
- Designs
- Ideas
- Quality fingerprint
- Production data
- Ramp Up
- Profitability
- Cost
- Issues
- Performance
- . . .

**The digital world**

- Engineering

**The physical world**

- Production
- Installation
- Operation
- Decommission

- As Designed
- As Built
- As Delivered
- As Maintained
The digital twin in aerospace challenges
The digital twin in aerospace challenges

There are a lot of different stakeholders and parties involved:

- Airports
- Airlines
- Aerospace control
- Limited resources like
  - Time
  - Kerosin
  - money
The **digital twin**

Centralized data lake

Replicate data
The digital twin
Distributed data landscape

Access on demand

Access on demand
How do we get there? Data Lake or Data Orchestration?

Centralized Data Lake + Distributed Data Landscape
Building Data-Driven Applications
Operator behavior at runtime

Visual Design via SAP Data Hub Modeler
- Intuitive design of complex data streams and transformations
- Execution and monitoring

Model Repository
- Re-usable graphs, operators
- Tag-based runtime specification
- Contains container descriptions

Image Composer
- Chooses containers based on operator tags
- Builds images on demand
- Deploy it on Kubernetes cluster
OPs-TIMAL Repair and Maintenance PoC

Data Orchestration & Decision Making Unit

SAP Data Hub

Holistic Optimization
Final Processing & Provisioning
Visualization

Engine Error
Cabin Error
Predictive Maintenance Module
Cabin Management System
Airplane Health Management System
Tail Assignment
LRU Tracking System
Solution

Next Stops
Criticality

DIEHL Aerospace
JEPPesen
Rolls-Royce

MTU Aero Engines
TWT
OPs-TIMAL PoC specific architecture for a Distributed Data Landscape with SAP Data Hub
OPs-TIMAL data hub pipelines

Tail Assignment

Criticality Conversion

Message Cleansing

Criticality Calculation
Creating the **Digital Twin** in OPs-TIMAL with SAP Data Hub

**SAP Data Hub**

- Partner A
- Partner B
- Partner C

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Thank you. Questions?
#Together, we make it happen.

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