IBM/SAP Evolution

Defence Workstream
Cognitive Equipment Advisor

Imagine Defense organizations that offer...

outstanding Mission Outcomes across critical domains

Performance Based Logistics

Integrated Supply Chains

Resilient Cyber Security

"Open" Source Intelligence

Command, Control and Communications

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Potential customers

Military Organizations

Military Organizations around the globe that need to increase mission readiness.

An inclusion of dedicated MRO companies that service military assets is possible.

Defense Industry

Defense Suppliers and constructions services for maintenance, repair and overhaul services need new planning platforms.

Connection in a supplier ecosystem with **digital twins**.

Performance Based Logistics

Up to 25% improvement in overall Fleet Readiness

Up to 37% potential increase in Stockage Effectiveness Rate

Up to 33% reduction in costly unscheduled repairs

References/ Use Cases

USMC 2nd Marine Aircraft Wing

Improvements of the maintenance planning:

Condition based: Detection of actually defective components

Predictive: ”Early Fail” in System Lifecyle

Outcome:

$1.8M Return on Investment in the first year
76k working hours saved per year on 16 aircraft

to be continued for Bell V-280 Valor...

https://www.ibm.com/blogs/client-voices/bell-redefines-aircraft-maintenance-with-ai-iot/

U.S. Army with approx. 350 Stryker

Natural Language Processing analysis

1. prescriptions how to fix

- 53,000 maintenance orders
- 3,000 technical documents
- 286,560 material requirements

2. actual material demand

$$\textit{Stockage Effectiveness Rate} = \frac{Issues}{Issues + All\ Back\ Orders}$$

US Air Force F-16

Predictive maintenance solution to analyse engine sensor data and mission status via dashboard.

Analysis of engine behaviour

Prediction of time until engine will fail (run time to failure)

Cognitive Equipment Advisor

Architecture

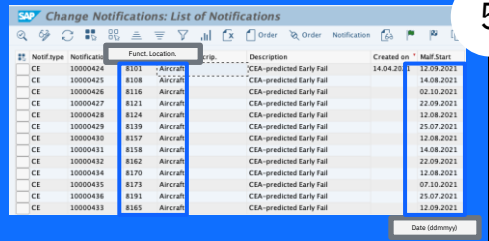
SAP outbound

SAP inbound

SAP

Master Data

- Functional Location
- Equipments
- Measurement Documents / Maintenance Notifications
- Maintenance Plans



Maintenance Notification

CEA-platform

1

OData

2

4

Early Fail (Classifier)

Runtime-to-failure (Interval)

5

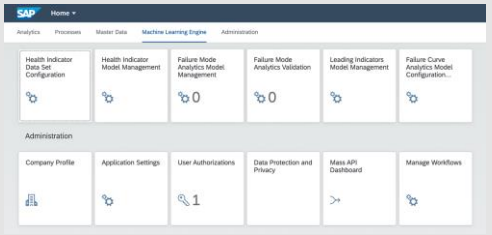
SAP BTP

Transaction Data

- Unit code / Tail / Y-Nr.
- System / Device
- Cycles, Measurement Documents, Maintenance Plans

Sensor Data
Text Data (Diagnositic Reports, Technical Documents)

3



Dashboard

Architecture

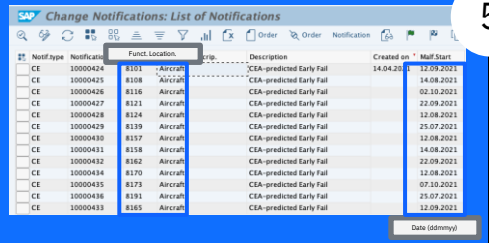
SAP outbound

SAP inbound

SAP

Master Data

- Functional Location
- Equipments
- Measurement Documents / Maintenance Notifications
- Maintenance Plans



Maintenance Notification

CEA-platform

1

OData

2

Early Fail (Classifier)

Runtime-to-failure (Interval)

4

5

Cloud Pak for Data

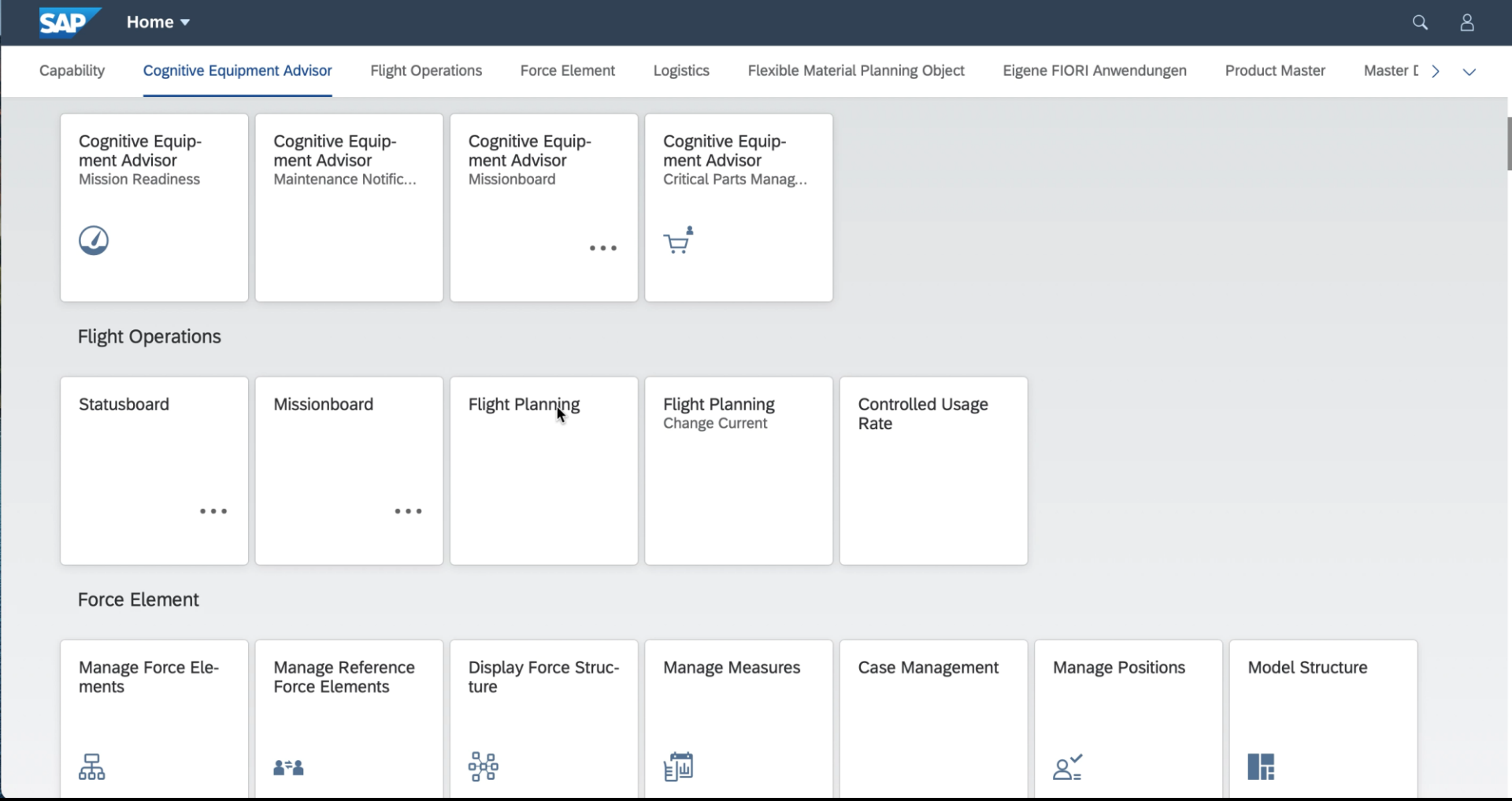
Transaction Data

- Unit code / Tail / Y-Nr.
- System / Device
- Cycles, Measurement Documents, Maintenance Plans

Sensor Data
Text Data (Diagnositic Reports, Technical Documents)

3

Dashboard


Home
Capability
Cognitive Equipment Advisor
Flight Operations
Force Element
Logistics
Flexible Material Planning Object
Eigene FIORI Anwendungen
Product Master
Master D
Cognitive Equip-ment Advisor
Mission Readiness
Cognitive Equip-ment Advisor
Maintenance Notific...
Cognitive Equip-ment Advisor
Missionboard
Cognitive Equip-ment Advisor
Critical Parts Manag...
Flight Operations
Statusboard
Missionboard
Flight Planning
Flight Planning
Change Current
Controlled Usage Rate
Force Element
Manage Force Ele-ments
Manage Reference Force Elements
Display Force Struc-ture
Manage Measures
Case Management
Manage Positions
Model Structure

Change Notifications: List of Notifications

Display object | Put in process | Postpone | Complete... | Partners | Partner | Address... | Document flow | Action log | More

Notification: 10000424 CE CEA-predicted Early Fail

Notific. Status: MEBS OSNO

Order: TechSt: KEIN

Cognitive Equipment Advisor

Predicted Downtime

CEA advices you to start maintenance BEFORE: 12.09.2021

Responsibilities

Planner Group: 020 / MAIN F16

Main WorkCtr: F16ENGIN / 1200 Work Center F-16 ENGINE

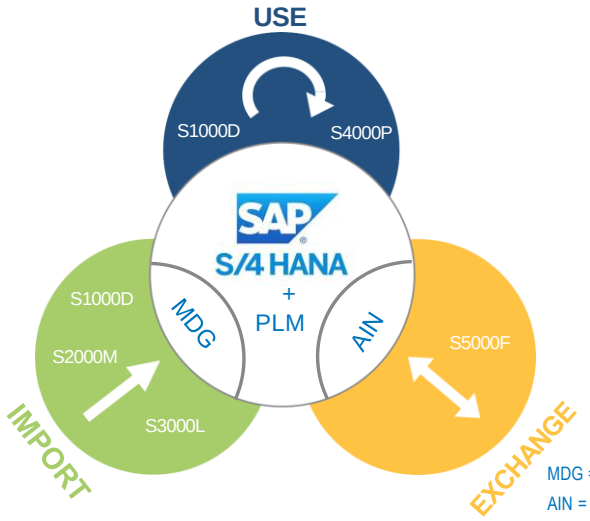
Reported By: CEA-PREDICT Notif. Date: 14.04.2021 17:06:39

shift left

Cognitive Equipment Advisor

Defense related Master-Data interface via SAP MDG

- Integration of S1000D/S2000M/S3000L-Data
- Industry leading ASD suite of specification
- First of its kind solution



MDG = SAP Master Data Governance

AIN = SAP Asset Intelligence Network

PLM = SAP Product Lifecycle Management Platform

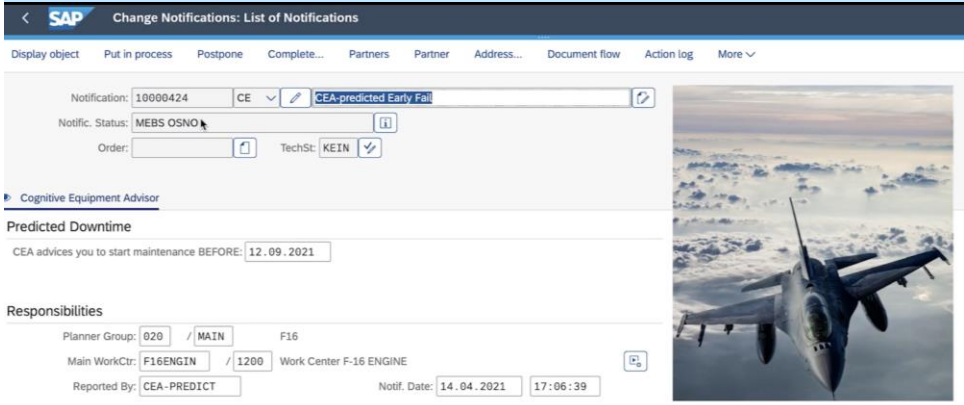
Master Data Relevance

Up to 25% improvement in overall fleet readiness

Up to 37% potential increase in Stockage effectiveness rate

Up to 33% reduction in costly unscheduled repairs

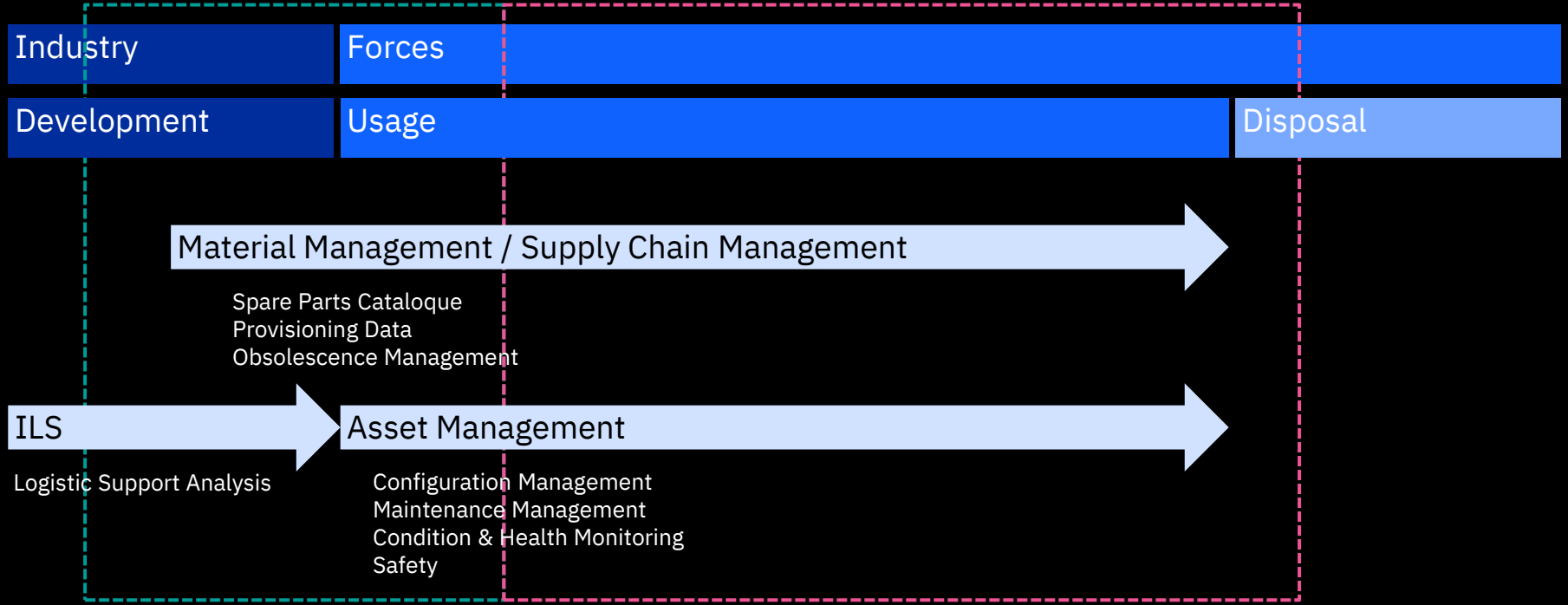
https://mediacenter.ibm.com/media/1_0peozr48



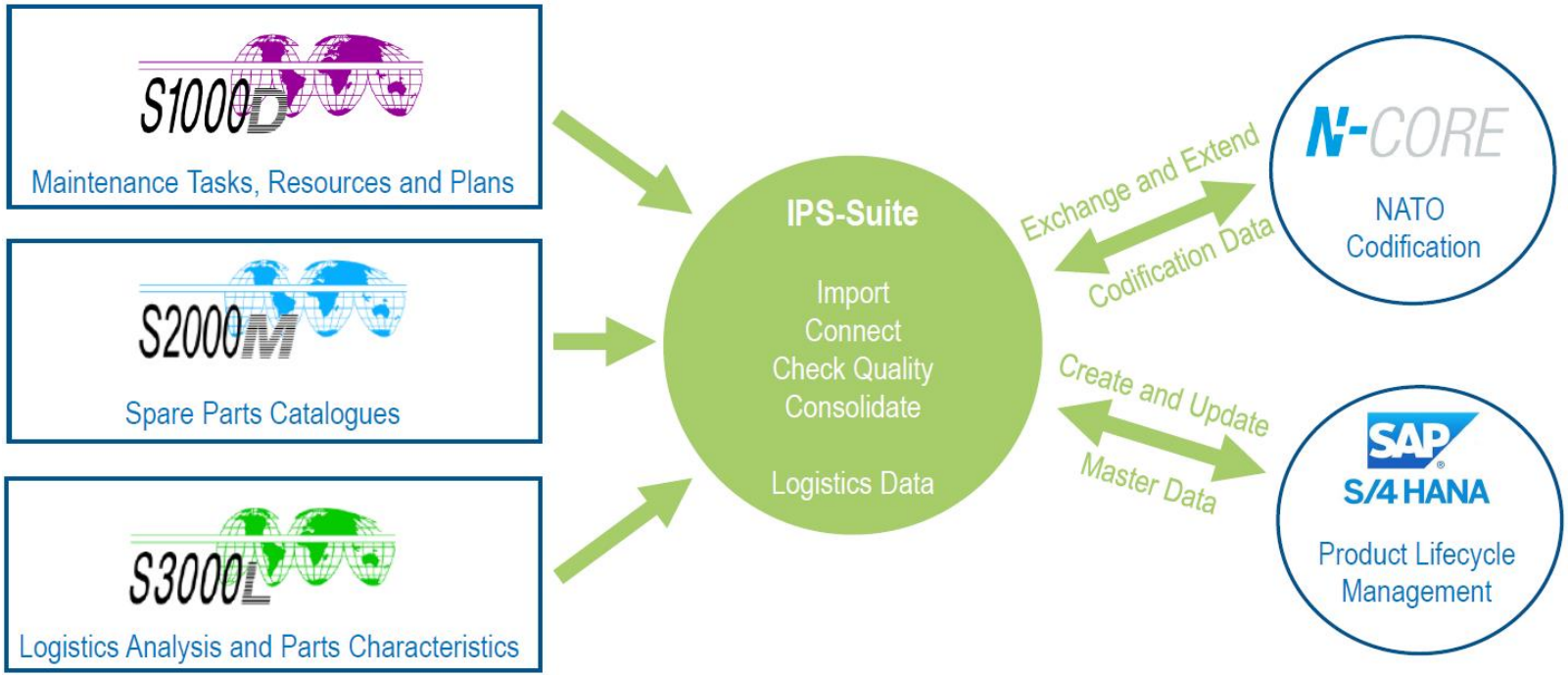
Shift left
Master Data Governance

adressing data driven issues at the source

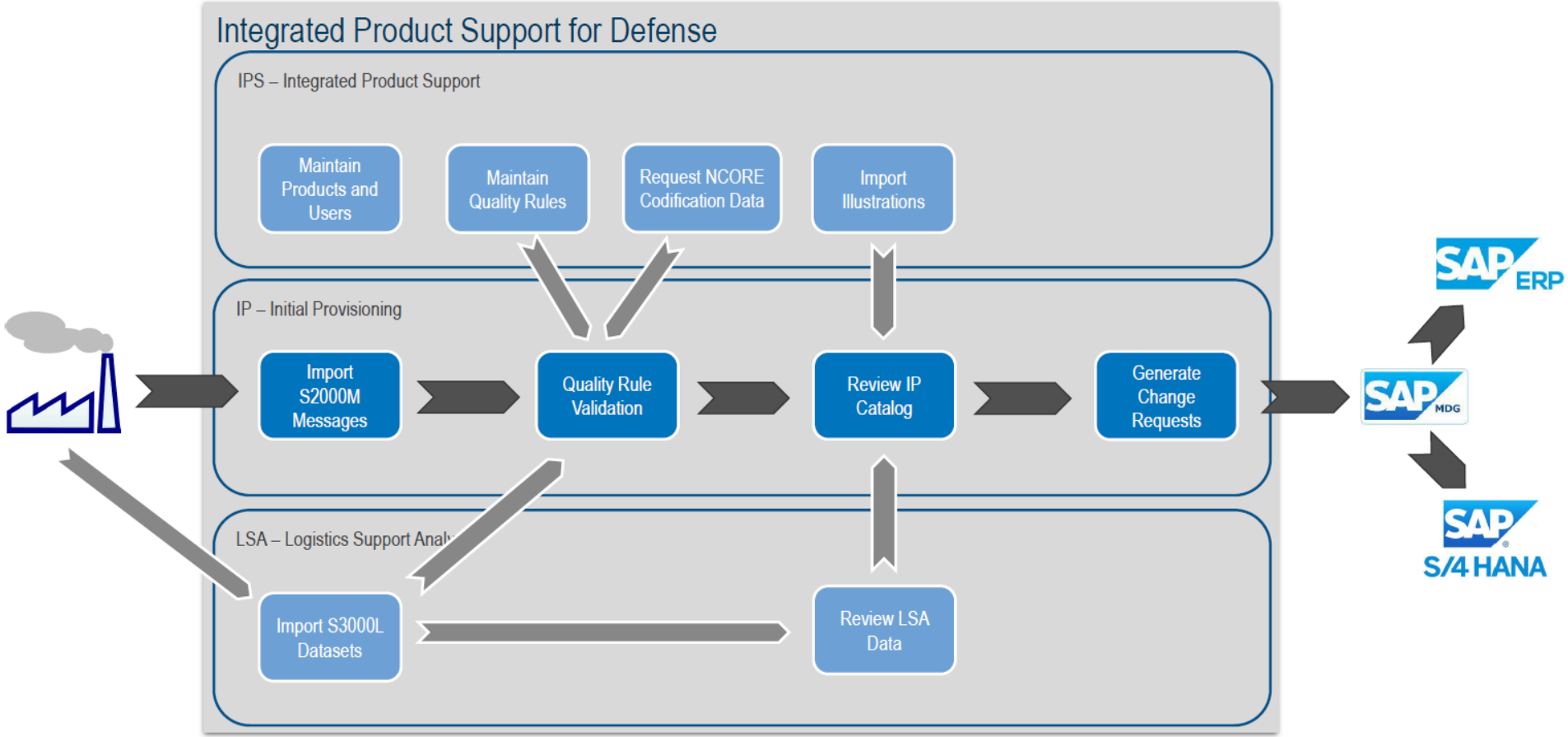
current focus of data-business

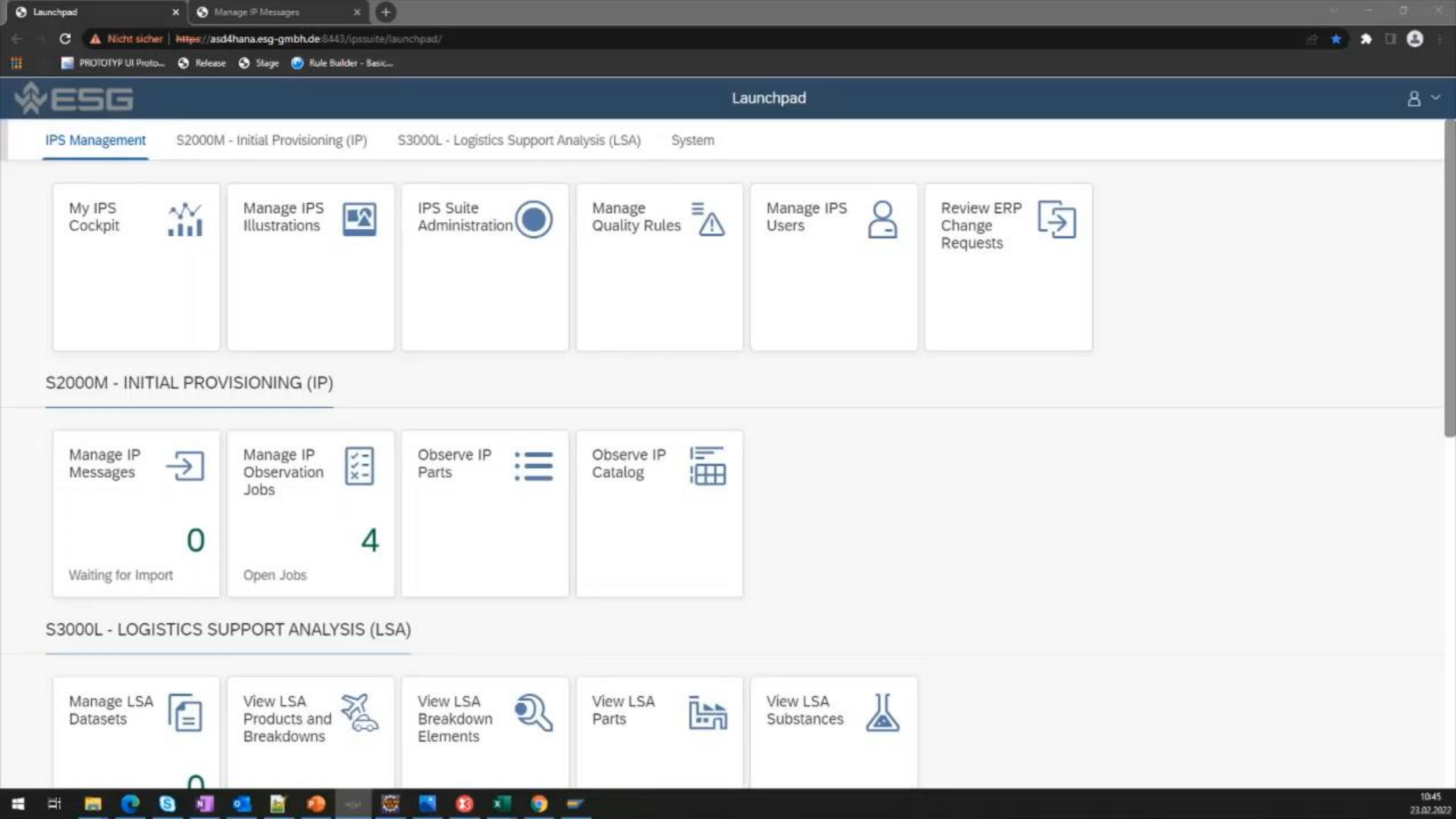


IPSD – Integrated Product Support for Defense



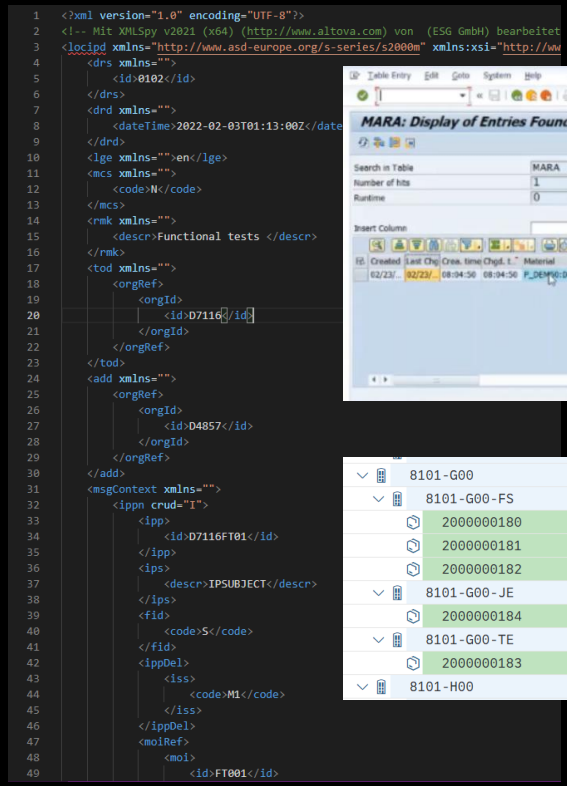
IPSD – Use Case Diagram




Launchpad
Manage IP Messages
Nicht sicher | https://asd4hana.esg-gmbh.de:8443/ipssuite/launchpad/
PROTOTYP UI Proto...
Release
Stage
Rule Builder - Basic...
ESG
Launchpad
IPS Management
S2000M - Initial Provisioning (IP)
S3000L - Logistics Support Analysis (LSA)
System
My IPS Cockpit
Manage IPS Illustrations
IPS Suite Administration
Manage Quality Rules
Manage IPS Users
Review ERP Change Requests
S2000M - INITIAL PROVISIONING (IP)
Manage IP Messages
0
Waiting for Import
Manage IP Observation Jobs
4
Open Jobs
Observe IP Parts
Observe IP Catalog
S3000L - LOGISTICS SUPPORT ANALYSIS (LSA)
Manage LSA Datasets
View LSA Products and Breakdowns
View LSA Breakdown Elements
View LSA Parts
View LSA Substances

IPSD – Integrated Product Support for Defense

1. Manage complex products
2. Integration of ASD specified data in one application
3. Simplification, facilitation of processes
4. E2E integrated process
5. Increased data quality
6. Reduce expense



Cognitive Equipment Advisor

1. Increase Mission Readiness
   Performance and Condition Based

2. Integrated Supply Chain Management
   Natural Language Processing

3. Digital Twin
   SAP Asset Intelligence Network AIN

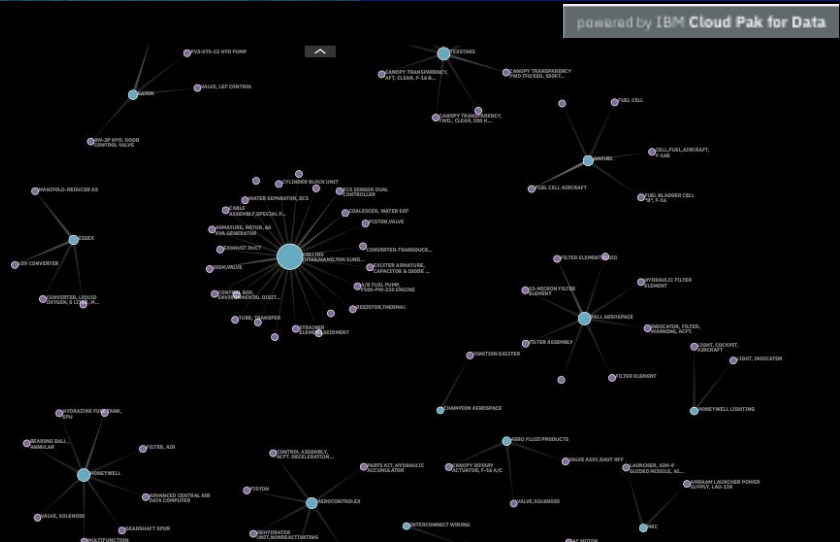
4. Shift Left
   Master Data S1000D / S2000M

Standardized Platforms in SAP S/4HANA Defense Solution

F-16 / F-35

Arleigh Burke Class

Stryker / Lynx



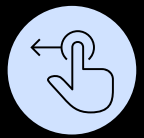
Value Proposition

Mission Readiness

CEA-Demo Video

SAP Intelligent Workflows

SAP IM&C



Shift left: **S1000D / S2000M**

IPS-Suite

SAP® for Defense & Security solution

S/4HANA Defense Solution (Demo21)

Advanced **AI-based predictive maintenance**

BTP

Secure and Hybrid Environement

CEA-Platform

IBM