Design-Driven Enterprise From Manufacturing to Service

Variantenreiches MTS oder CTO

08.04.2022

THE BEST RUN SAP

Our model company

Conveyor Solutions AG is a manufacturer of

- components
- equipments
- systems

for sorting and transporting of luggage or packages.

They

- configure to customers needs (CTO/MTS),
- design customer specific solutions (ETO, CTO+),
- manufacture in large quantities.

Conveyor’s Challenge

Senior management would like to

- Become more **customer centric** and **agile**
- Reduce **cost** and **workload**

So, they engage an external consulting company to propose **a new approach**.

25.5.2022

End-to-End Traceability for Discrete Manufacturers

https://events.sap.com/eur/sap-industry-4now-traceability/de/home

Inbound Traceability

at BOSCH

Standardization for purchase-to-pay (P2P) automatization for inbound materials in manufacturing

Traceability in Production and Outbound

at SAP Innovation Hub

Generating the digital twin of a valve in a Live-Demo using multi-stage assembly in SAPs valve-making Industry 4.0 factory

at Federal Mogul

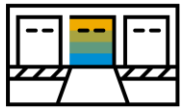
Insights from a reference customer applying SAP Digital Manufacturing Cloud as their Manufacturing Execution System to trace the manufacturing process of pistons

with Movilitas

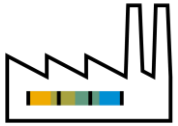
Generating and sharing the digital twin of batteries across a network of customers and suppliers in a Live-Demo

The Digital Thread 4.0 enables “automated” Traceability and Digital Twins

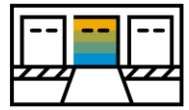
Materials from Supplier



Warehouses



Production sites



Warehouses

Customer

Digital Twins

Inbound Traceability

Production Traceability

Outbound Traceability

Supply Chain Traceability

Digital Thread 4.0 delivers **Integration** and **Automation**

Design-Driven Enterprise

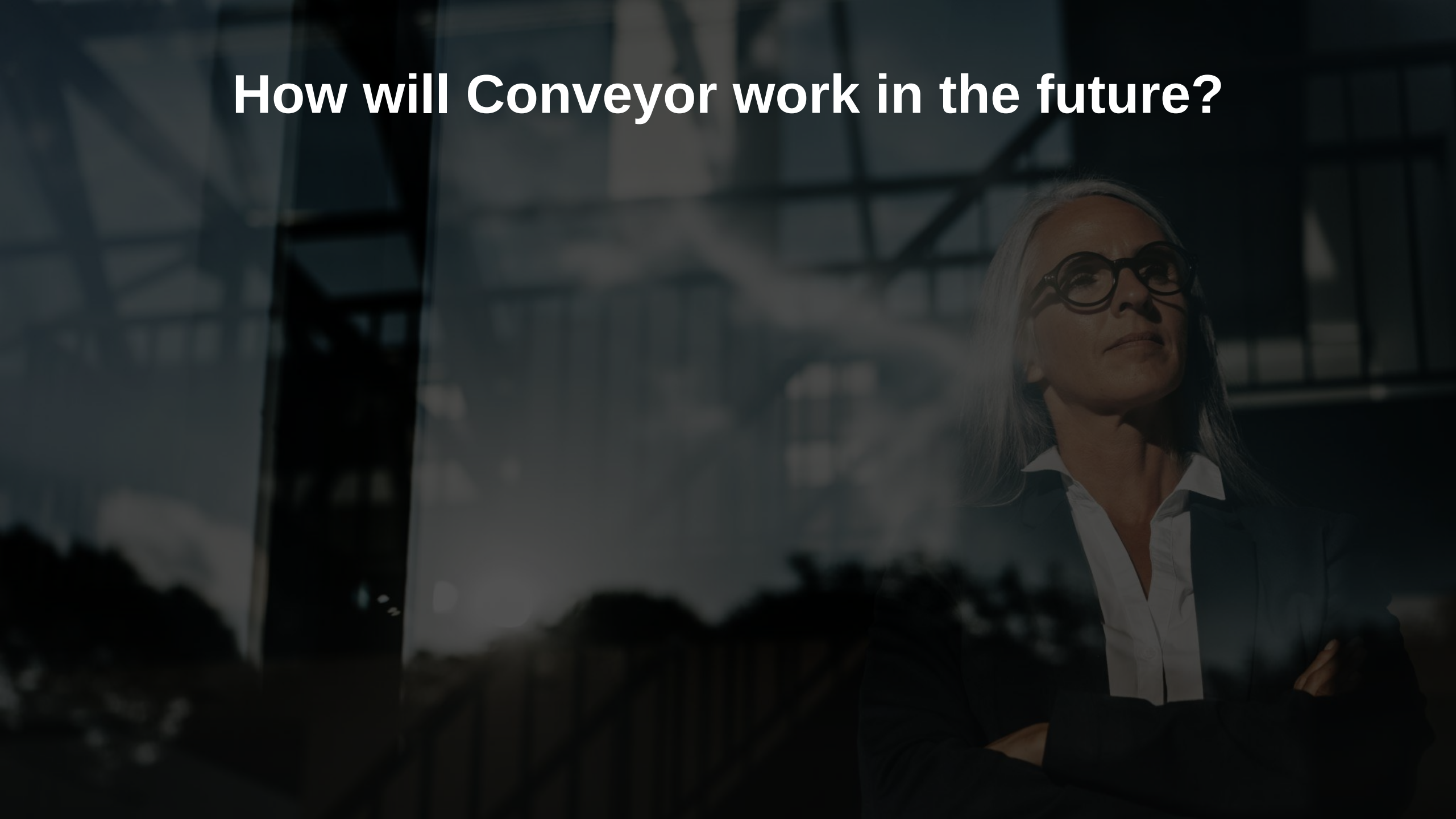
AGIL.EFFICIENT.CUSTOMER-CENTRIC

- **Increase the level of automation** in the process flow from engineering into sales, production, service with **model once configure anywhere.**

- Use a **smart product structure** as **single central solution** to achieve **high level of consistency, automation and accuracy** across all departments.

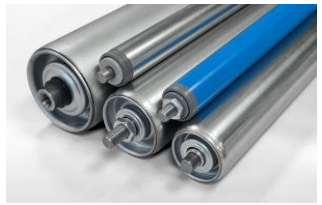
- Improve the leverage of their existing investment in the **SAP core**. **Reduce complexity** of applications outside of the core.

How will Conveyor work in the future?



Different Products – Different Value Chains – Different Processes

MTS
Make-to-Stock



Design

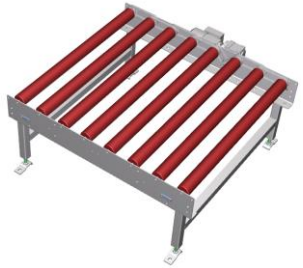
Supply Chain

Manufacturing

Sell

Aftermarket Service

CTO
Configure-to-Order
closed



Design

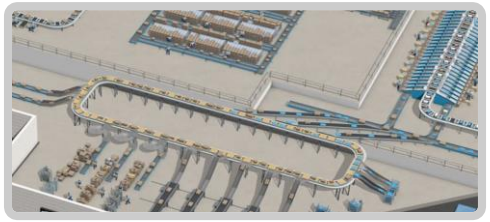
Sell

Supply Chain

Manufacturing

Aftermarket Service

ETO
Engineer-to-Order



Sell

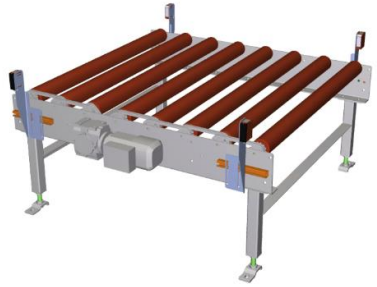
Engineering

Supply Chain

Manufacturing

Aftermarket Service

CTO+
Configure-to-Order
open



Design

Sell

Engineering

Supply Chain

Manufacturing

Aftermarket Service

Since sales, purchasing and planning are deeply embedded in ERP, an ERP-centric approach can provide full flexibility.

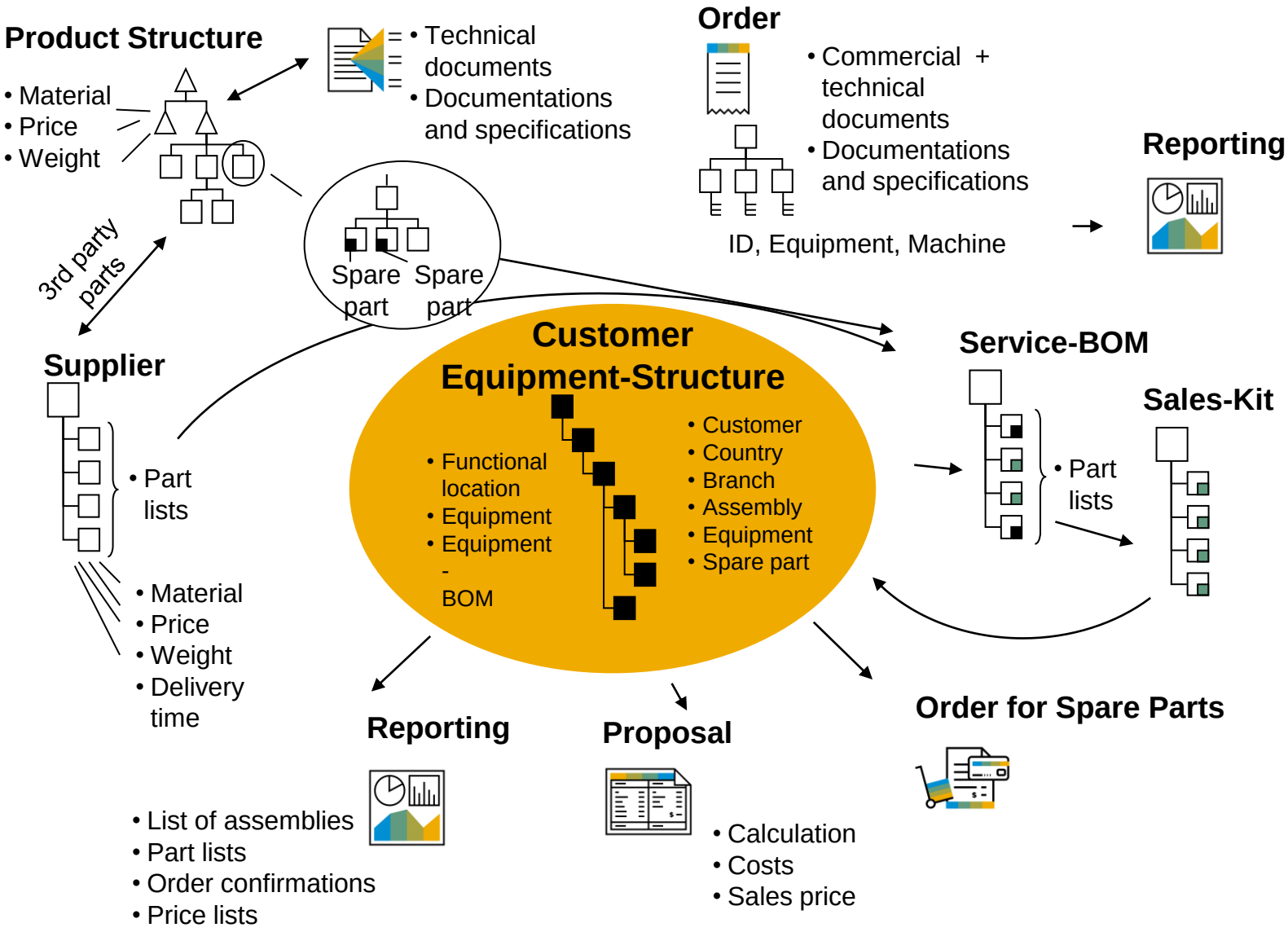
Creation of Service Data for each Configuration

Digital twins revolutionize product development and bring manufacturers, system operators, suppliers and service providers together and network them with one another.

Service Engineering for each Configuration:

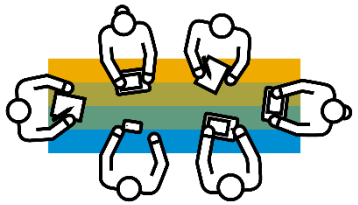
The Product Structure creates master data, documents and data to make it easy to manage the digital twin for configurable products and services.

The Product Structure enables the Digital Twin by **integrating customer, supplier, product & service engineering and manufacturing into a consistent data flow.**



Model once configure anywhere

Our Vision: Digital Thread 4.0 automates all business processes



Product Teams…

…feed the product model with new iterations and versions, aligned with customer requirements and compatibility

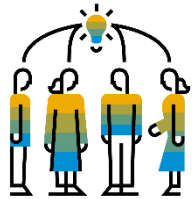
Feed

Consume

Digital Product Structure

Consume

Feed



Extended Enterprise…

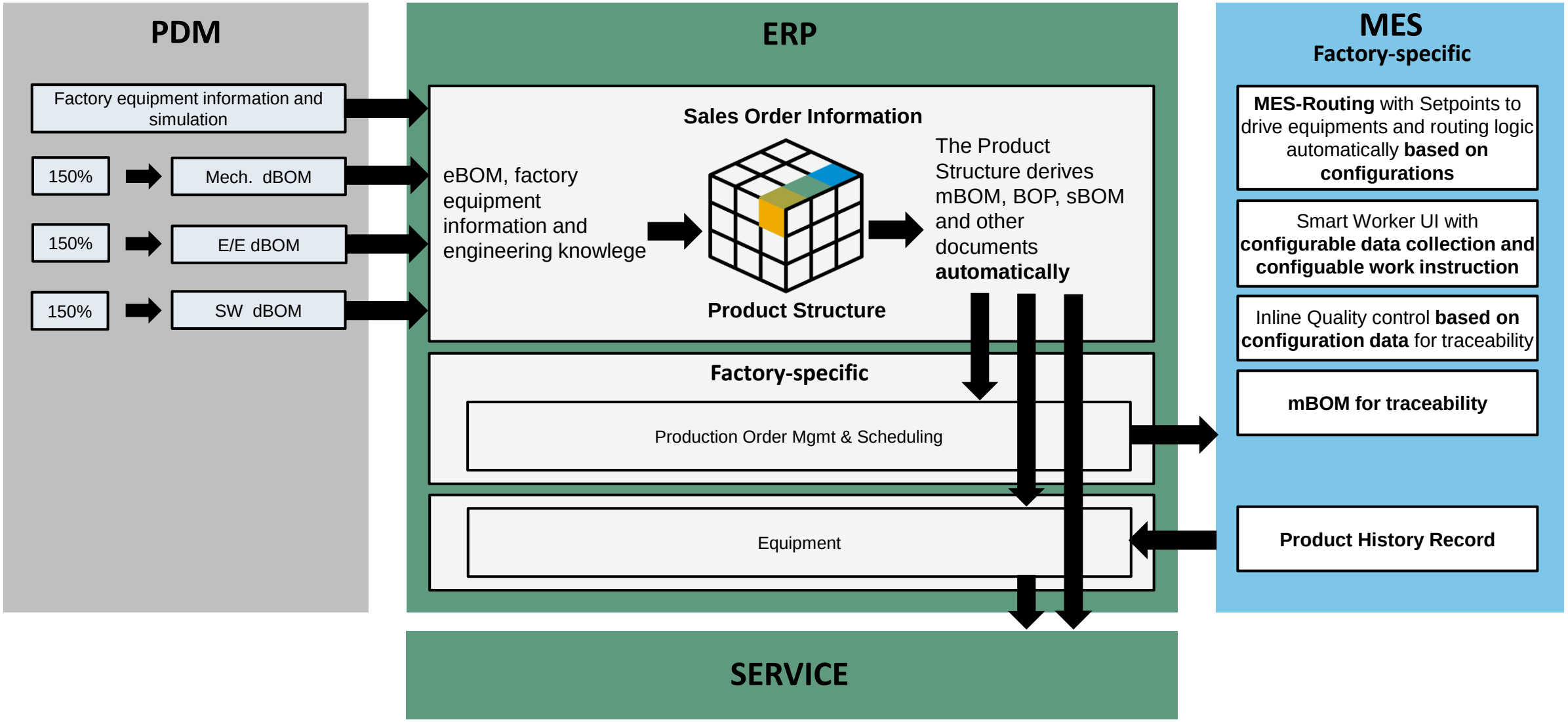
…consumes product model/information to buy, make, sell/configure, simulate or maintain a product.

Webinar 1 – Create Portfolio & Product Structure

Webinar 1 – Consume in Sales
Webinar 2 – Consume in Manufacturing (01.04.2022)
Webinar 3 – Consume in Service (08.04.2022)

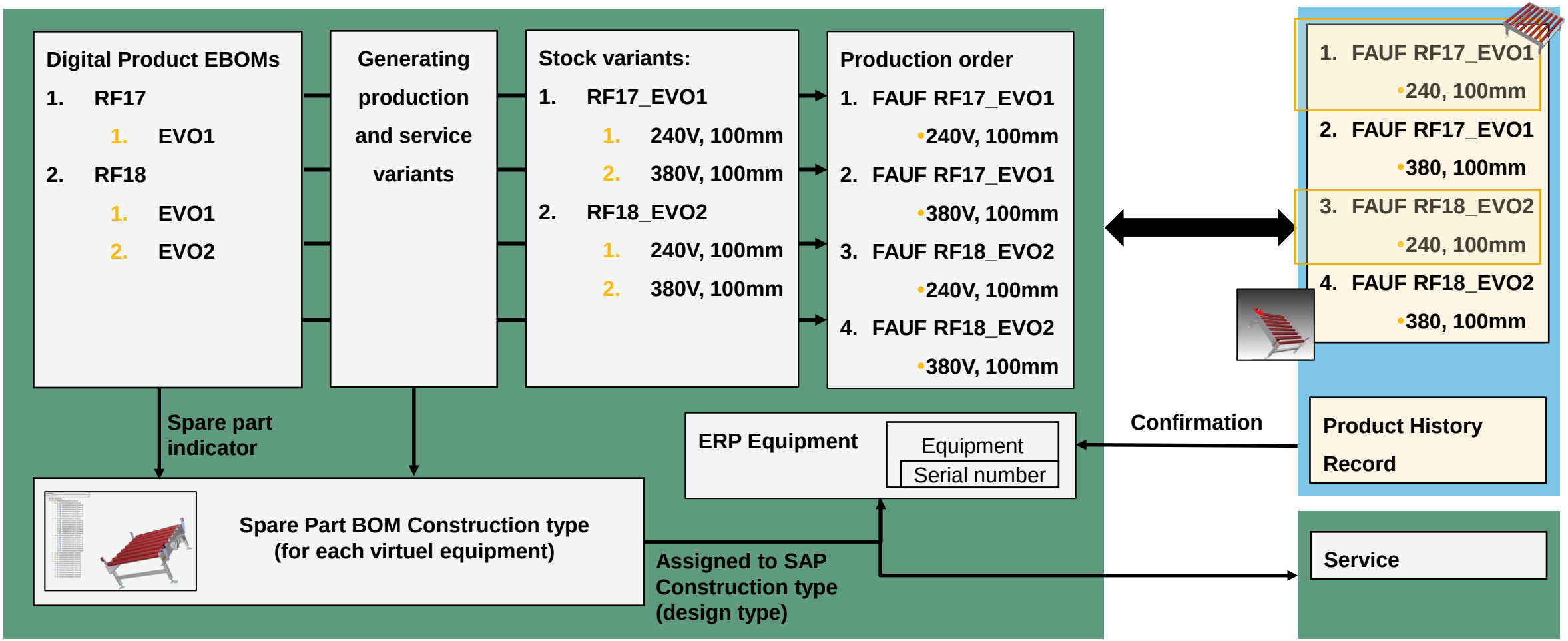
Automatically generated Engineering Data for Planning & Execution

Architecture

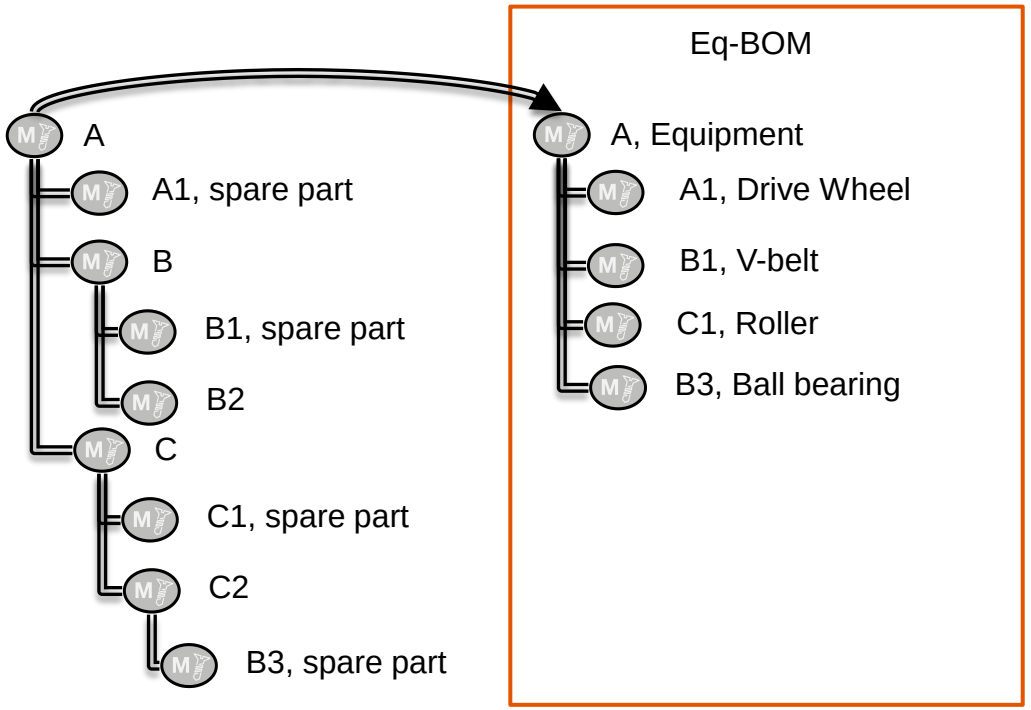


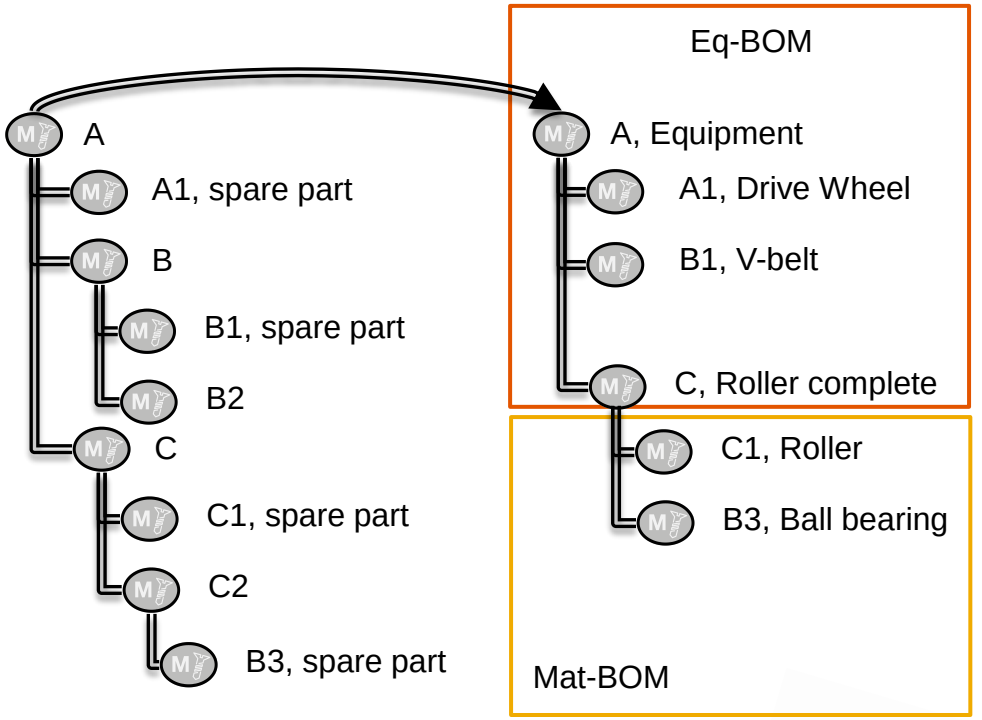
Hand over of Traceability Data to Service

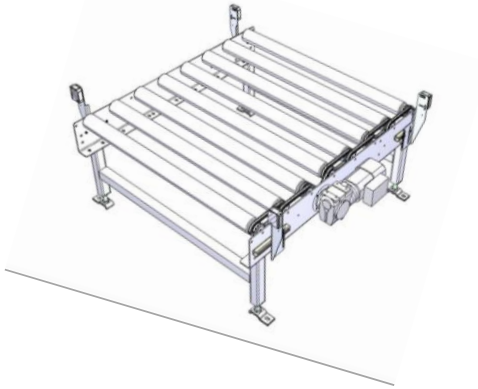
Data model



Product Structure Transformation in Service Engineering



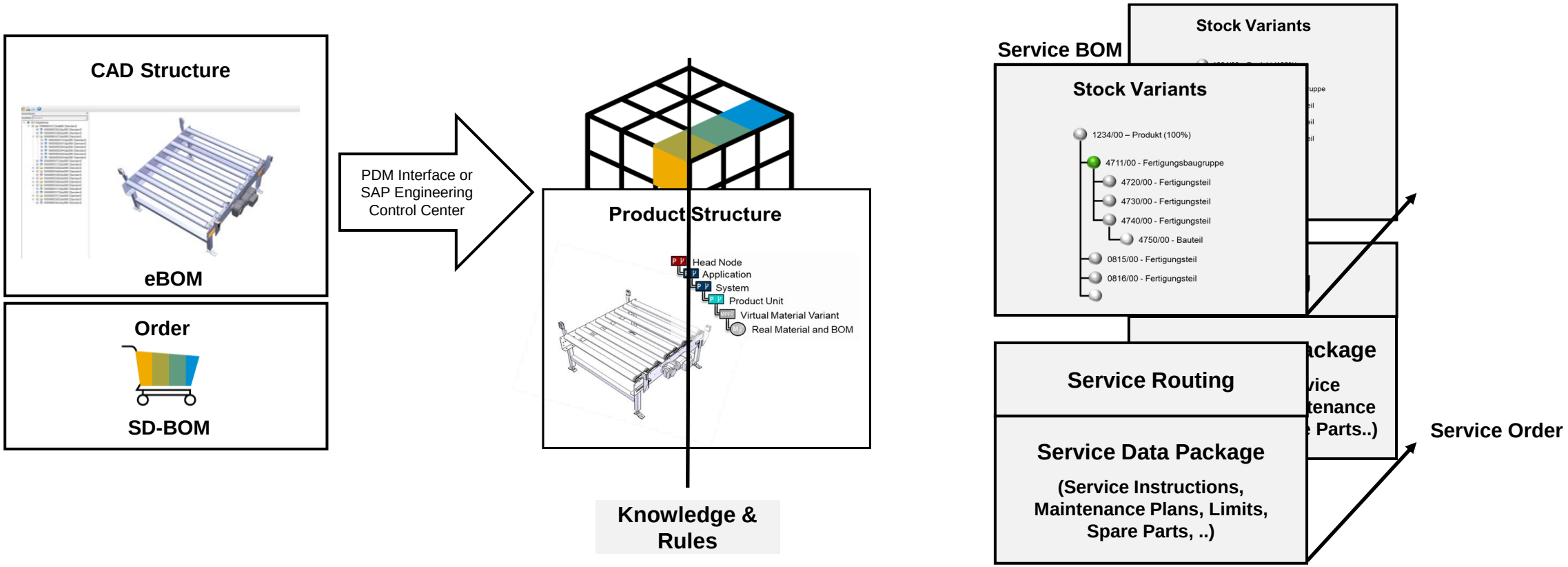




C is a spare part kit that is procured

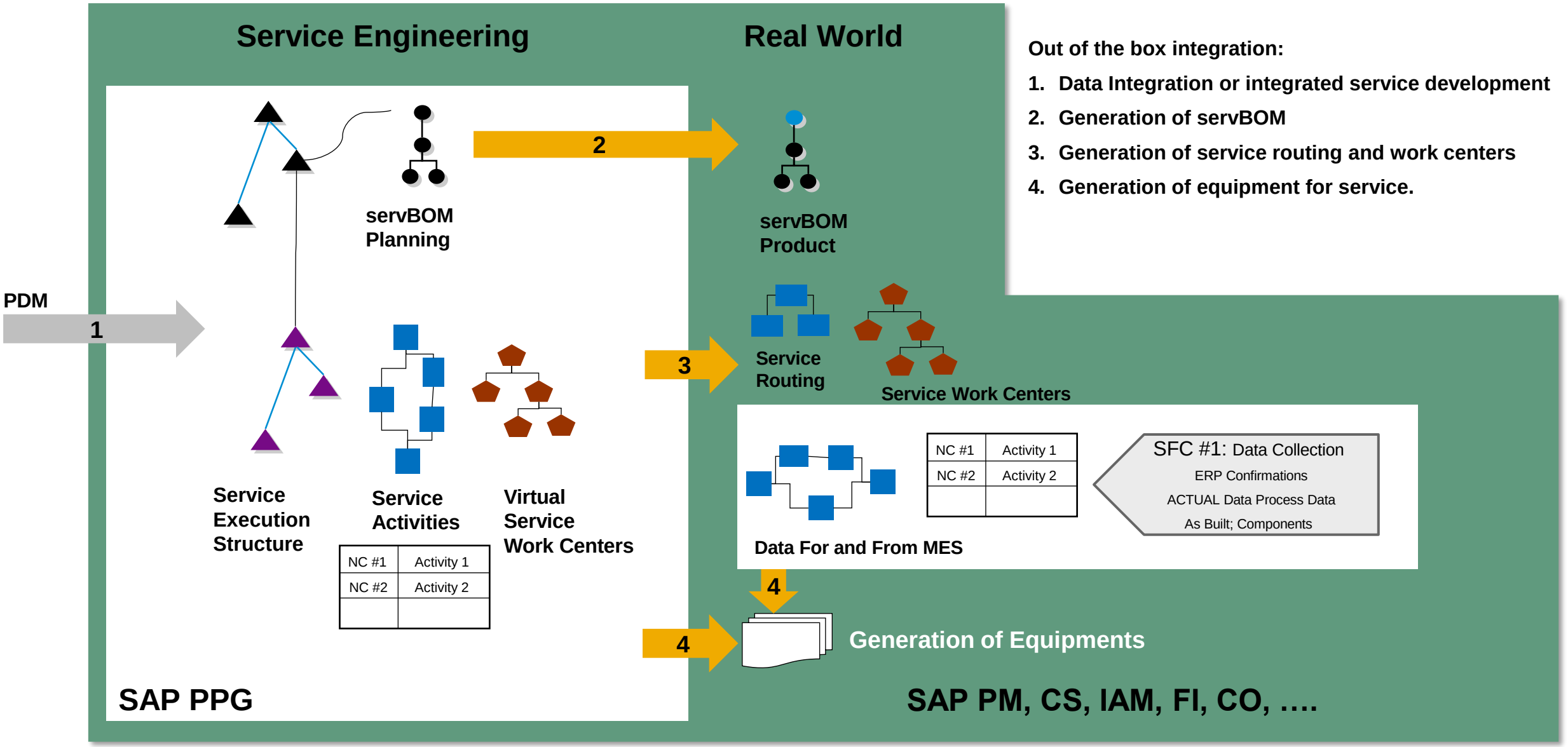
A1, B1, and B3 are spare parts that are listed in the equipment BOM.

Review released product structure for service



- The **Product Structure** contains different views for eBOM & service BOM.
- The **Product Structure** supports the service sales configuration (Webinar 1).
- In this webinar the **Product Structure** generates the **classic BOM models,** routings and other documents/settings for service.

“Virtual” Service Engineering and “Operational” Asset in a single solution

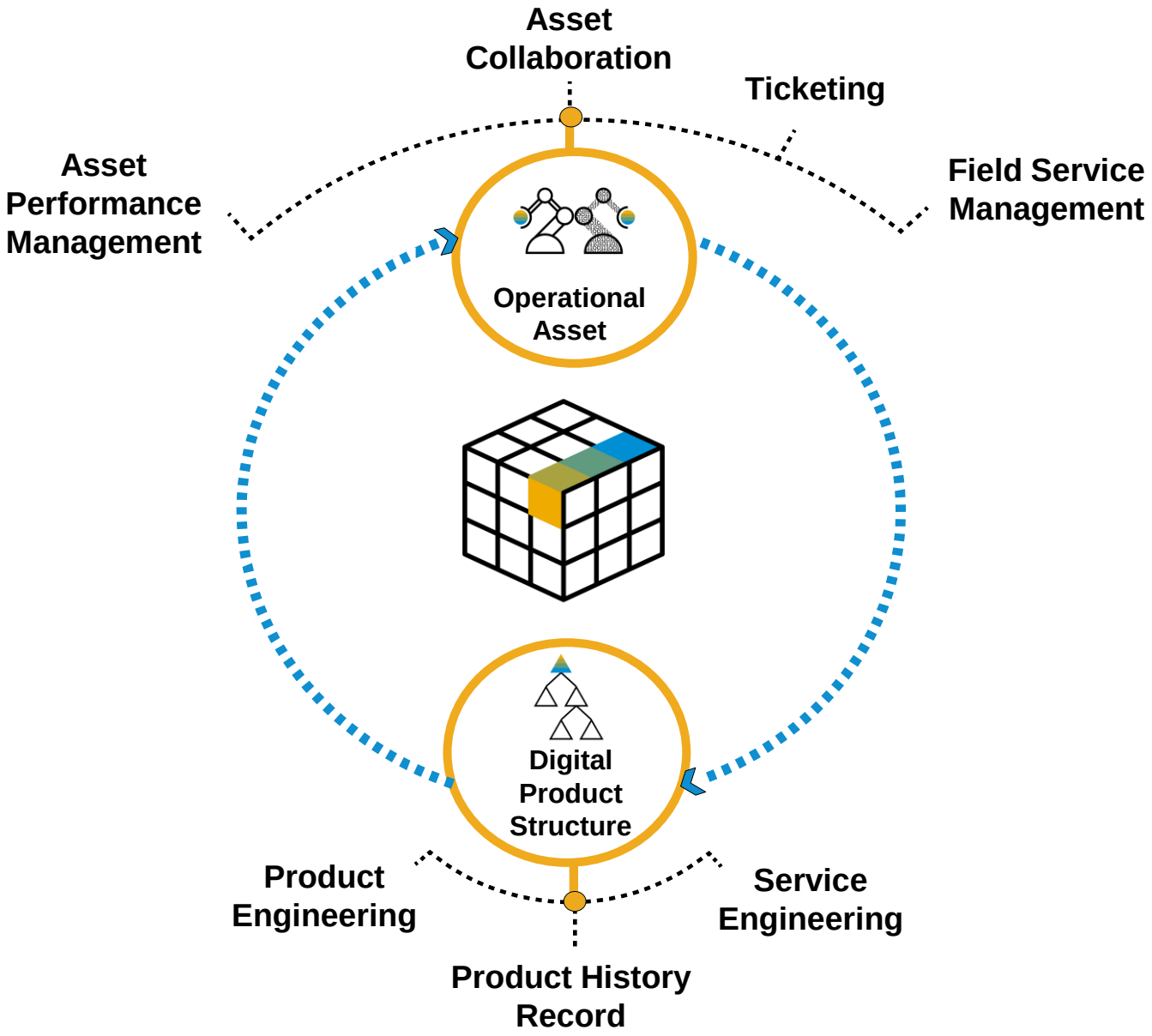


Out of the box integration:

1. **Data Integration or integrated service development**
2. **Generation of servBOM**
3. **Generation of service routing and work centers**
4. **Generation of equipment for service.**

“Virtual” Service Engineering and “Operational” Asset with SAP

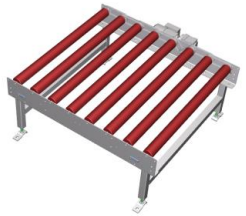
- AIN: Asset Intelligence Network
- APM: Asset Performance Management
- PAI: Predictive Asset Insights
- APSM: Asset Strategy and Performance Management
- FSM: Filed Service Management
- PPG: Product and Process Governance
- DMC: Digital Manufacturing Cloud
- C4S: SAP Service Cloud



How will Conveyor work within SAP in the future?

DESIGN-DRIVEN ENTERPRISE MTS/CTO

From Manufacturing to Service



PRODUCT MANAGEMENT | DESIGN | ENGINEER | SELL | PURCHASE | PLAN | MANUFACTURE | OPERATE

Product
- Variant Management
- Configuration Management
- Innovation Management
- Requirements Management
- Systems-Engineering
- Product Validation

Detailed Engineering
- Material Management
- Component Classification
- E-BOM
- 3D-Model

Internal/external Collaboration
- Design Collaboration
- Document Collaboration
- Systems Engineering

in Production
- Routing Management
- Integration of MTM
- Work Instruction Management
- Change Mgmt and Integration across and within different SAP BOM-types
- BOM Knowledge Management, Conversion and Configuration
- Configuration of Quality Management

in Service
- Configuration of services, documents, and service-BOM

in Sales
- Enhancement of configuration with application knowledge

Modelling
- Life Cycle Management of Product model
- Management of Variant Configuration with Engineering Knowledge

Customer Order - Configuration

Document Collaboration
Supplier Collaboration (only with Ariba)
Visual Product Analysis

Short- to Midterm-Planning and Optimization
- Order network
- Production Optimization considering product configuration dependent routing capacity, demand, takt times, set up times, man power and tooling while also considering material availability.

Order Management
- Generation and Release of production orders

Assembly
- Configuration specific work Instructiion

Inline Quality Management
- Collection of configuration specific quality data during each production step.

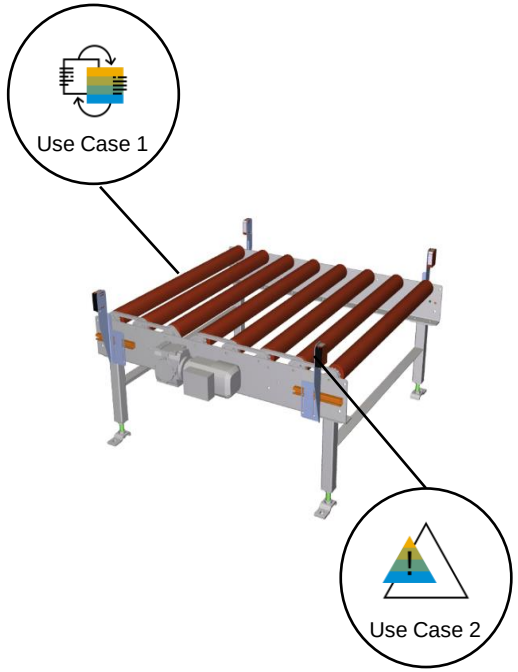
Machine Integration
- Configuration specific machine control

Intelligent Asset Management
Providing the digital twin to internal and external collaboration partners
IOT services

Service-Management
- Ticketing
- Service-Order Mgmt.
- Service Order Execution
- Visual Spareparts
- Visual Service-Instructions
- Digital Twin Insight
- Digital Twin Monetarization

Process Flow: Introduction

Use Case 1: Asset data collaboration



Use Case 2: Service order management

Conveyor Solutions AG

Gregor
Assembly Operator

Hannes
Service Engineer

Robyn
Service Operations

Keno
Service Technician

Green Foods Company

Isabell
Master Data Expert

Jana
Maintenance Operator

Process Flow: From Manufacturing to Service

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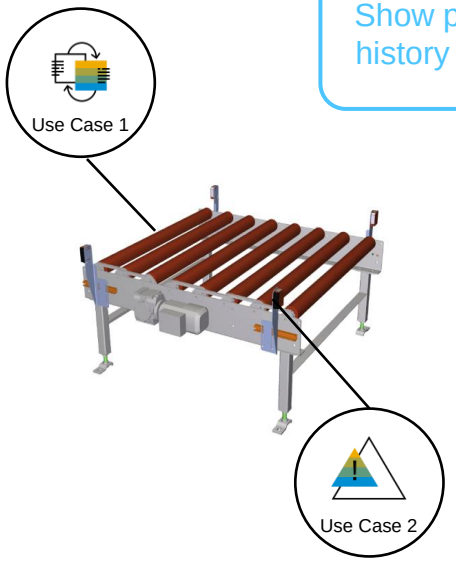

Use Case 1: Asset data collaboration

Show product history record

Create Service Data (Equipment)

Handover Digital Twin to Customer

Overview Digital Twin

Reject Instruction to Manufacturer

Update Service Manual

Receive announcement

Use Case 2: Service order management

Detect Problem and Open Ticket

Check Ticket (360° View)

Plan Service Order

Execute Service order

Process Flow: From Manufacturing to Service

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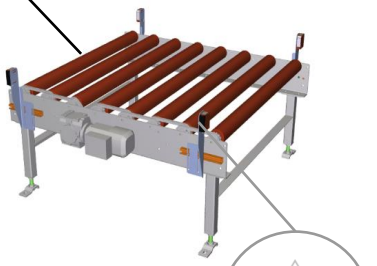
Use Case 1



Use Case 2

Show product history record

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Detect Problem and Open Ticket

Check Ticket (360° View)

Plan Service Order

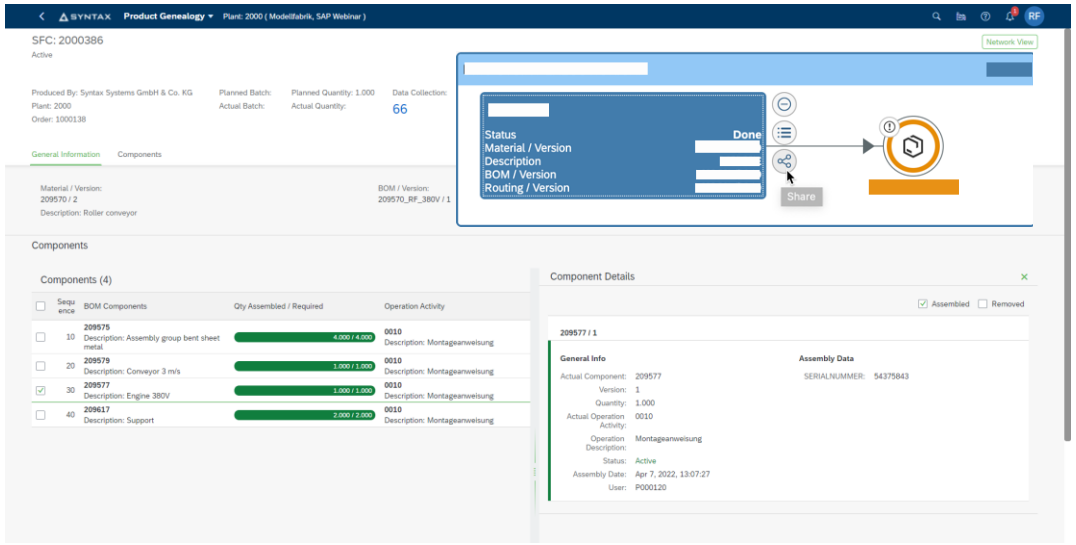
Execute Service order

Finish Assembly & create Product History Record

Business Outcomes

*"As a **Key-User Production,** I want to see the confirmations from the shop floor in ERP so that we can build a digital twin."*

Gregor
Assembly Operator



Process Highlights

Assembly record of a product

Order execution status according to the order execution status

Any data collected during the production process,

View the assembled quantities of SFCs compared to their required assembled quantities

Assembly status and record of planned and unplanned components - quantity already assembled or consumed versus quantity required

Process Flow: From Manufacturing to Service

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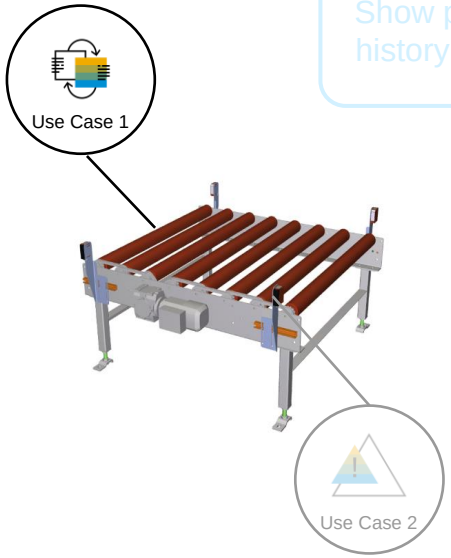

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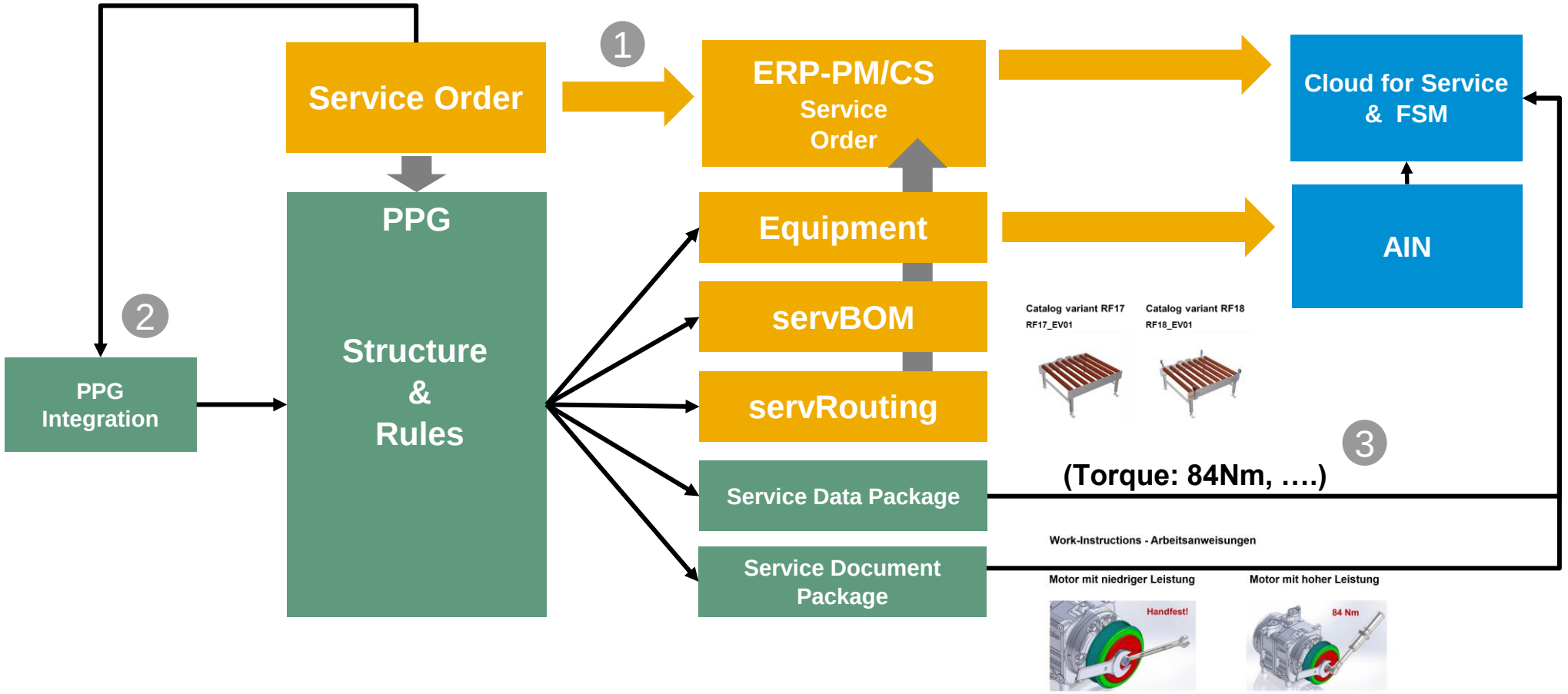
Automated Generation and Integration of Service Data



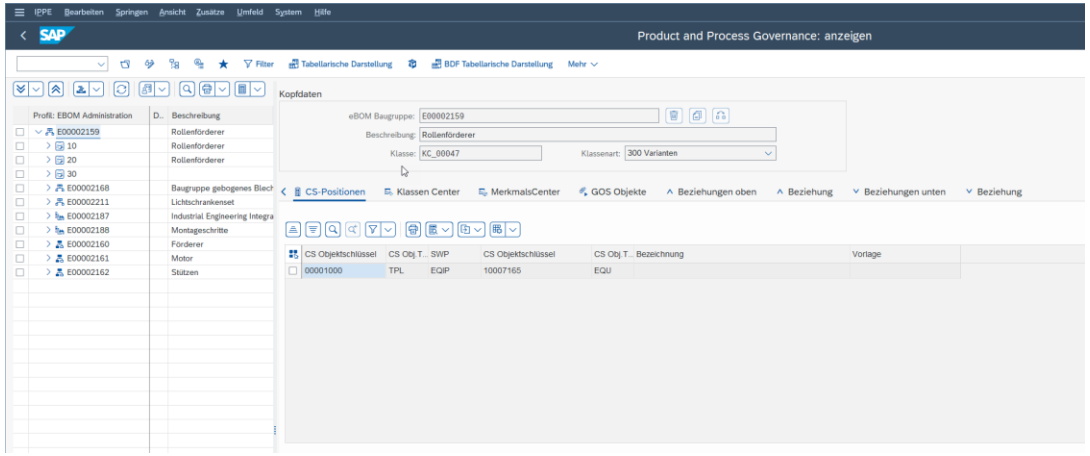
1. The service order based on the equipment number.
2. The PPG integration and data model assigns or generates the variant specific service data.
3. To provide more detailed data for each service configuration a service data package is generated.

Create Service Data (Equipment)

Business Outcomes

*"As a **Service Engineer,** I want to use asset information in the product structure so that I can automate service processes."*

Hannes
Service Engineer



Process Highlights

Use asset objects in product structure

Integrated service planning

Automate documentation processes

Use serialization information from various processes

Benefit from single source of truth

Process Flow: From Manufacturing to Service

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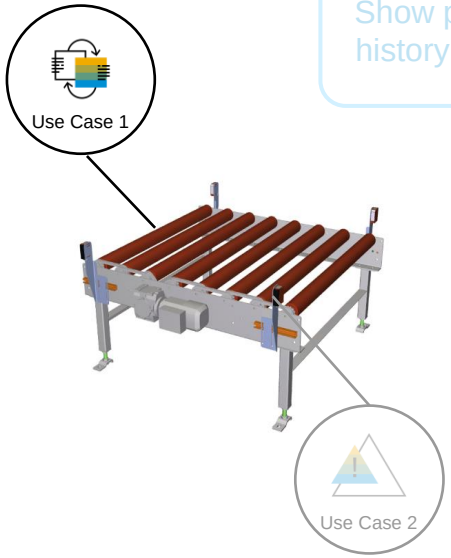

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Process Flow: From Manufacturing to Service

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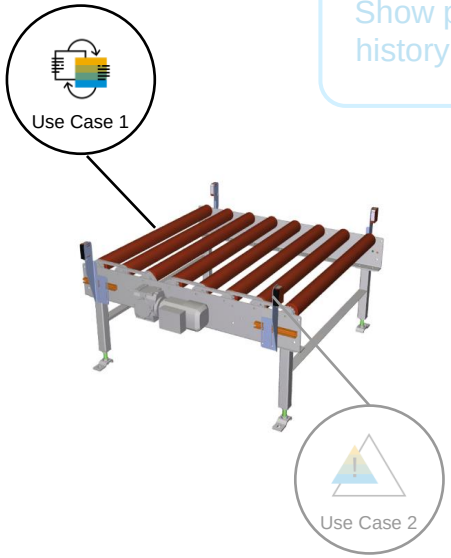

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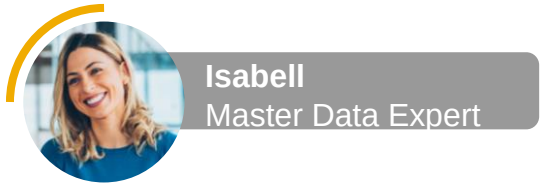
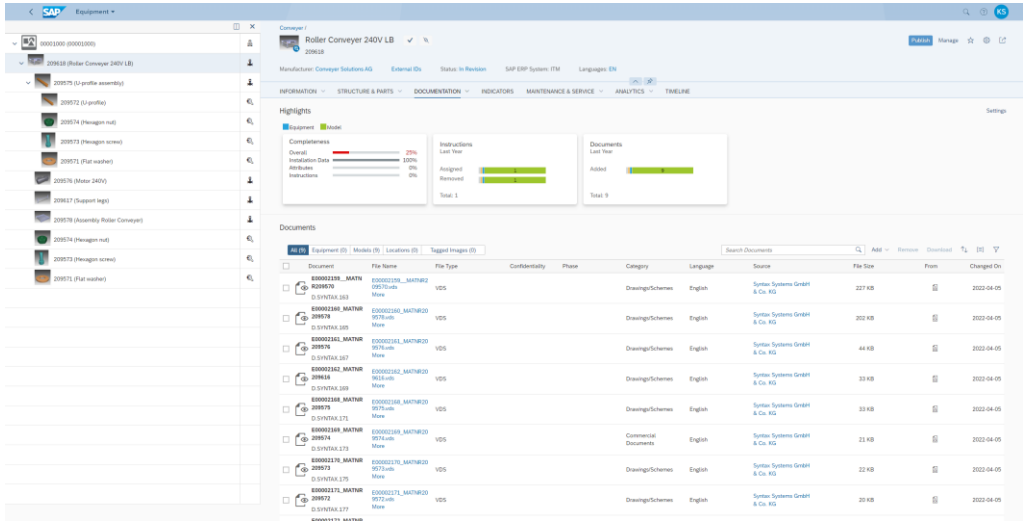
Overview Digital Twin

Business Outcomes

*“As a **customer,** I want to see all asset data in one central repository!”*



Isabell
Master Data Expert



Process Highlights

Full digital representation of all physical equipment along their lifecycle

360° degree view on digital twin (location, assets and spare parts)

Secure network to enable connection to various business partners

Fully integrated to SAP S/4 HANA

Single source of truth for all maintenance relevant data

Process Flow: From Manufacturing to Service

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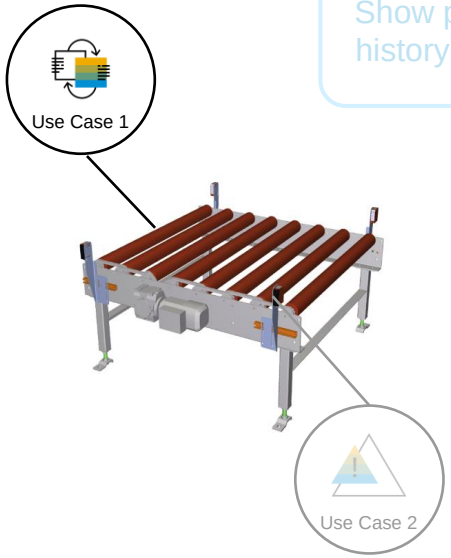

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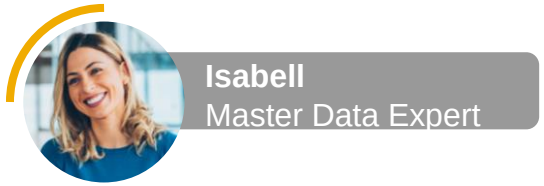
Business Outcomes

*"As a **customer,** I want a direct contact to the manufacturer to make sure that the master data of my equipment is always up-to-date."*



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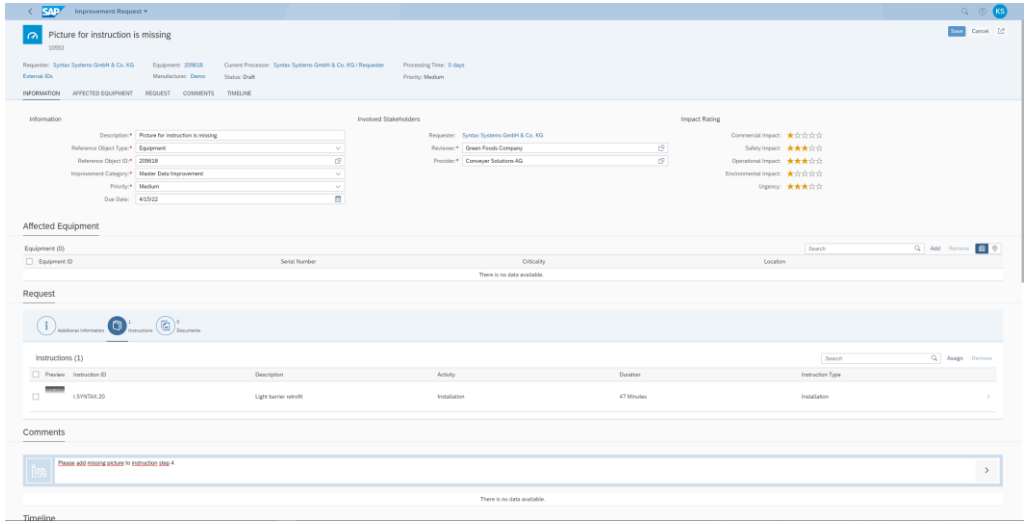

Process Highlights

Step-by-step description of maintenance instructions including 3D files

Reduction of master data maintenance effort by close collaboration between business partners

Higher master data quality and complete asset information

Enable performance improvement loop to manufacturer

Process Flow: From Manufacturing to Service

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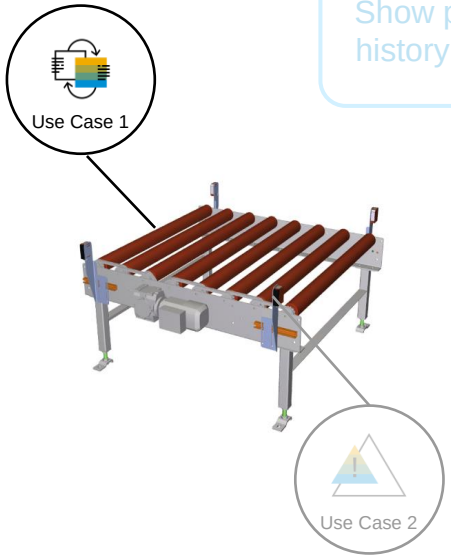

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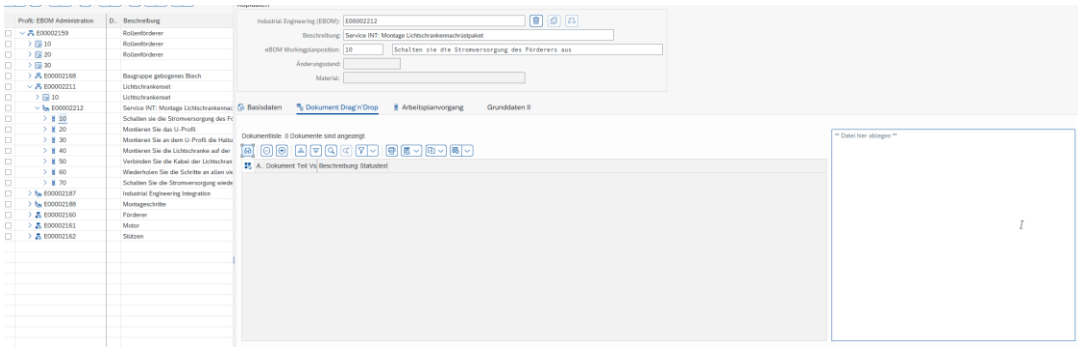
Business Outcomes

*"As a **Service Engineer,** I want to keep instructions up to date so that service processes run best."*

Hannes
Service Engineer



Process Highlights

Add documents per Drag & Drop

Powerful document management (SAP DMS)

Use asset information in product structure

Automate handover of instructions to customers, partners and employees

Improve service quality

Process Flow: From Manufacturing to Service

Conveyor Solutions AG

Gregor
Assembly Operator

Hannes
Service Engineer

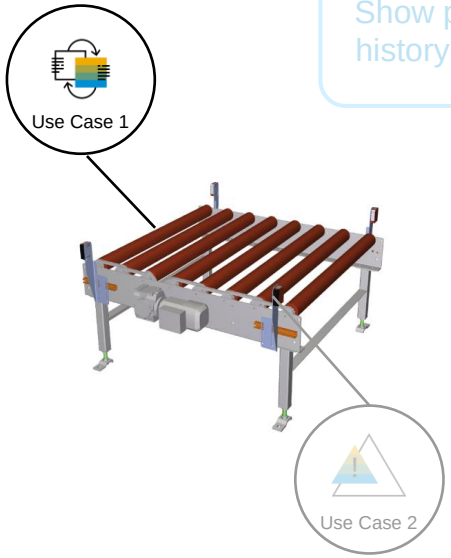
Robyn
Service Operations

Keno
Service Technician

Green Foods Company

Isabell
Master Data Expert

Jana
Maintenance Operator



Use Case 1: Asset data collaboration

Show product history record

Create Service Data (Equipment)

Handover Digital Twin to Customer

Overview Digital Twin

Reject Instruction to Manufacturer

Update Service Manual

Receive announcement

Use Case 2: Service order management

Detect Problem and Open Ticket

Check Ticket (360° View)

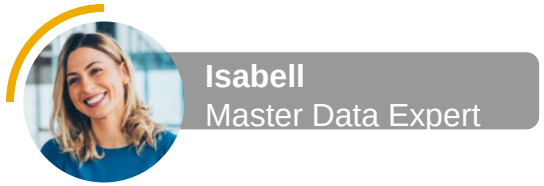
Plan Service Order

Execute Service order

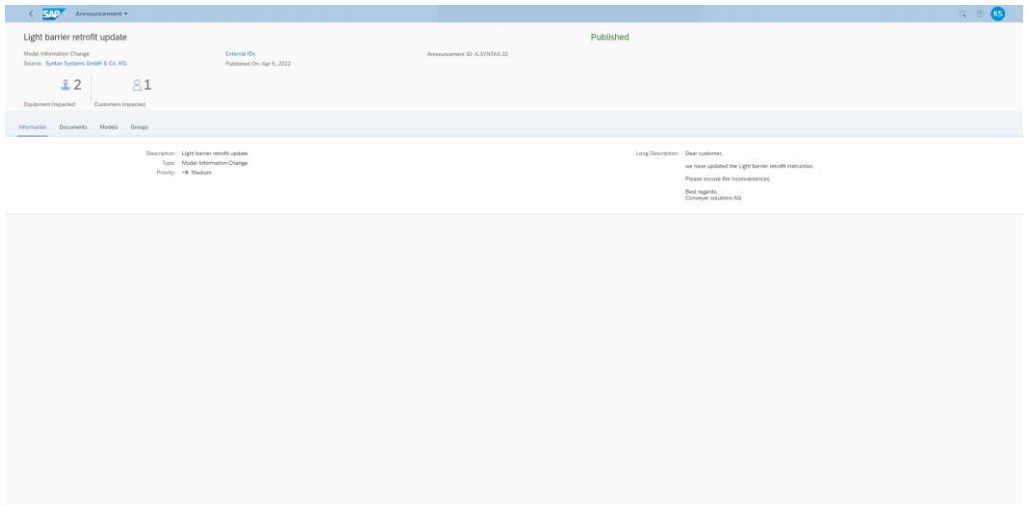
Receive announcement

Business Outcomes

*"As a **customer,** I want to receive updates on the master data directly from the manufacturer."*



Isabell
Master Data Expert



Process Highlights

Receive announcements on recalls, documentation & firmware updates from manufacturer

Close collaboration between manufacturer and operator

Always have access to the **most recent documentation/information**

Higher master data quality and less search effort due to standardized content

Process Flow: From Manufacturing to Service

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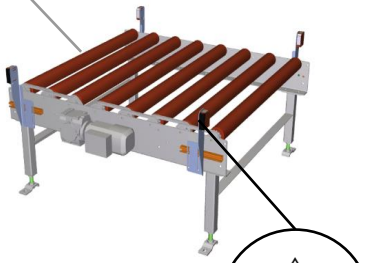
Use Case 1: Asset data collaboration

Use Case 1



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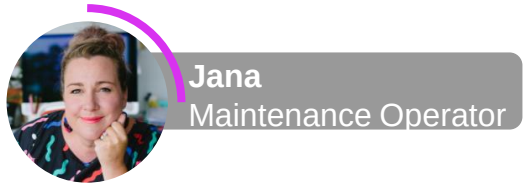
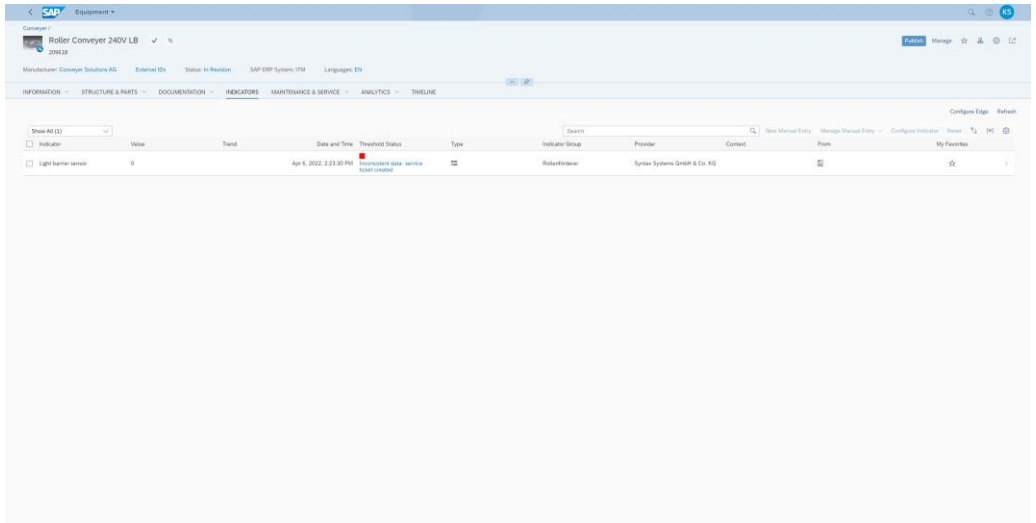
Business Outcomes

*"As a **Maintenance Operator,** I want to see the health status of my assets."*



Jana
Maintenance Operator



Process Highlights

Real-time analysis of asset condition and health status

Retrofit option for older machines

Increase asset availability and reduce maintenance costs

Basis for **predictive maintenance & advanced analytics**

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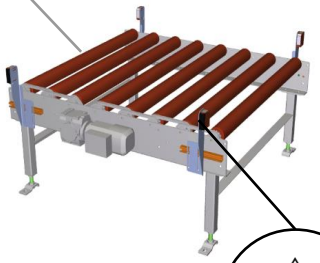

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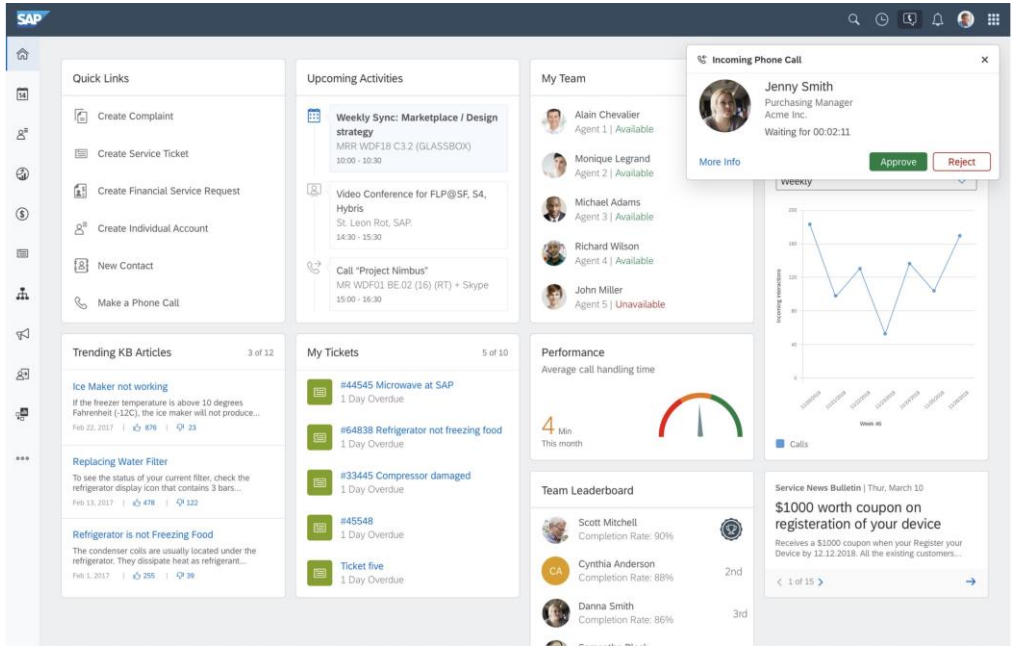
Check Ticket – 360° View

Business Outcomes

*"Responsible for **Service Operations,** I want to see 360° views of my service customers."*

Robyn
Service Operations



Process Highlights

360° - Integrated view of customer, equipment's and contracts & back-office support

Engage with customer across any channel – by using chat, phone, email, social media

Start collaborations and establish feedback loops through contextual social collaboration with integrated feed

Increase productivity handle my tickets in a timely manner through routing and escalation rules

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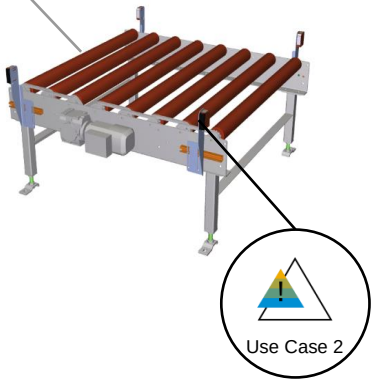

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Business Outcomes

*"As a **Dispatcher,** I want to easily plan the service execution."*

Robyn
Service Operations

Process Highlights

Accelerate service execution with easy planning tools and a visual drag'n'drop interface

Cut resolution times with skills management: find the best technician with the right skills for each job

Improve productivity by optimizing routes with the map view planning

Optimize resource utilization and minimize idle time with automated, AI-based scheduling and dispatching

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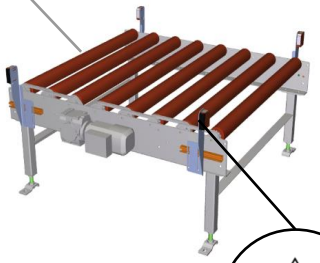

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Execute service order

Business Outcomes

*"As a **Service Technician,** I want to have all relevant information to easily repair the assets."*

Keno
Service Technician

Process Highlights

Increase transparency by giving technicians a mobile access to relevant information related to customers, services, products and spare parts

Make it easy to find the right location with mapping and GPS tracking –and maintain the visibility on where they are

Support your technicians with mobile smartforms to meet EHS (environment, health and safety) standards

Reduce paper work and enable a smooth information flow by capturing time, material and expenses on mobile device

Stay productive also when connectivity is low and utilize the offline functionality

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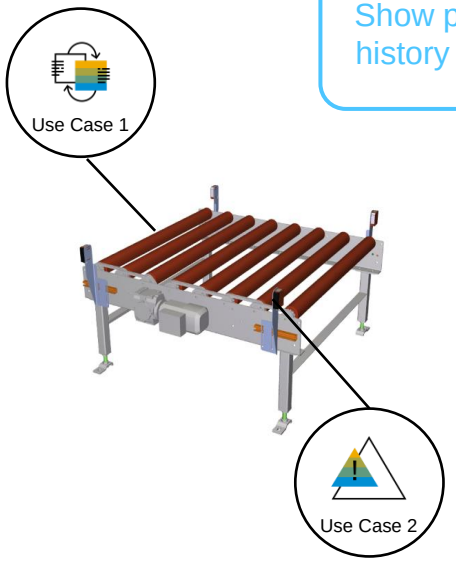

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Summary

The Design-Driven Enterprise is AGIL.EFFICIENT.CUSTOMER-CENTRIC

- ✓ **Increased the level of automation** in the process flow from engineering into sales, production, service with **model once configure anywhere.**

- ✓ Using a **smart product structure** as **single central solution** to achieve **high level of consistency, automation and accuracy** across all departments.

- ✓ Improved leverage of their existing investment in the **SAP Core**. **Reduce complexity** of applications outside of the core.

Design-Driven Enterprise
im Projektgeschäft

From Bid to Design & Procurement

14.04.2022

Thank you & see you soon.