

Design-Driven Enterprise From Manufacturing to Service

Variant-rich MTS or CTO

Gear 7-38 1.2.75

s/n 3941501

MT-450919

Teet

Advanced
Motor 30051

Prototype Phase

Torque

08.04.2022

THE BEST RUN



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

Check the recording at <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

with Catena-X

Hear from SAP product management how end-to-end traceability fits into the Catena-X strategy

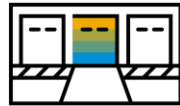
with Movilitas

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



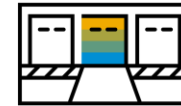
Materials from Supplier



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

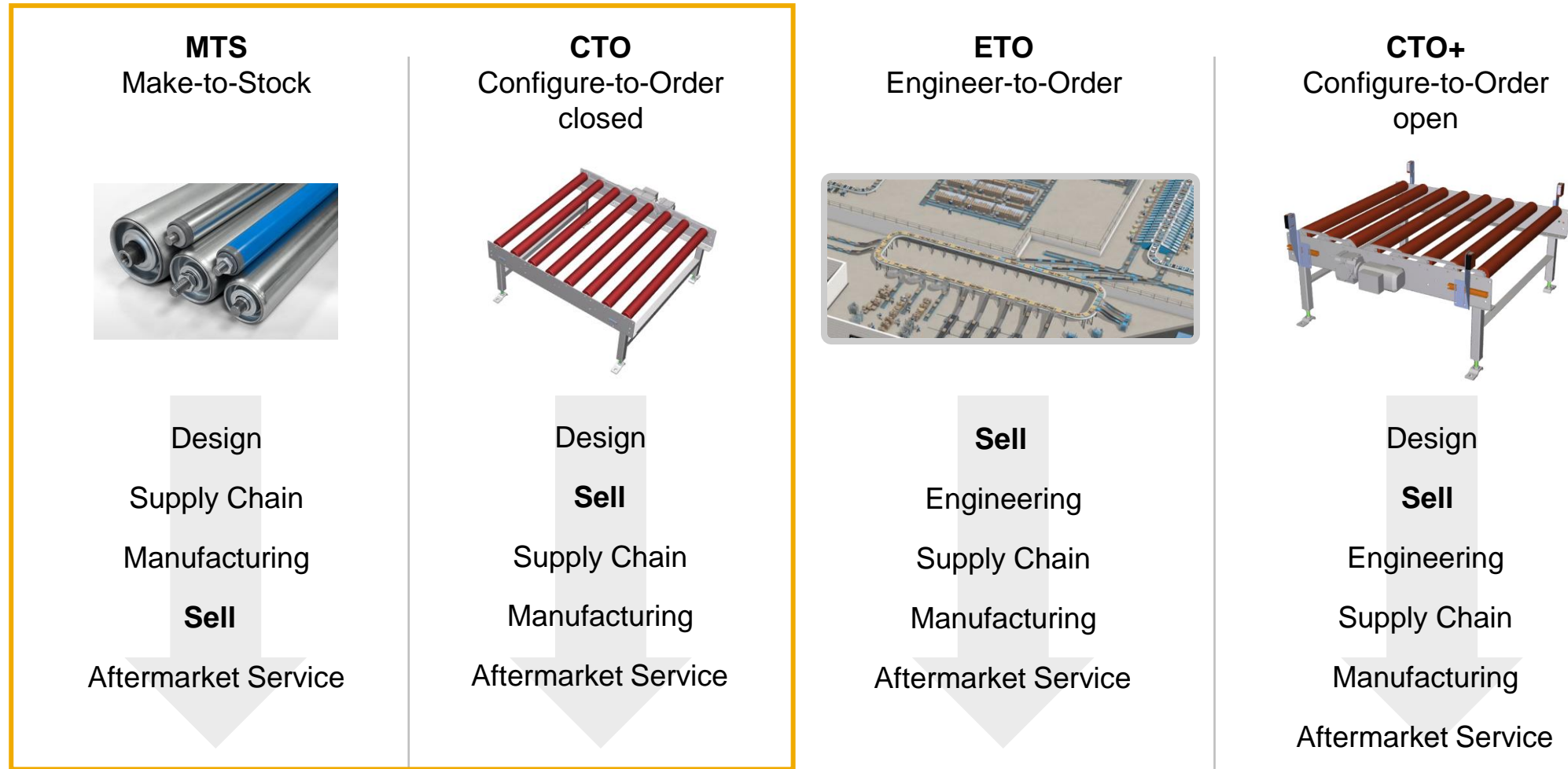
- **Increase the level of automation** in the process flow from engineering into sales, production, service with **model once configure anywhere.**
- Use a **smart product structure** as **single central solution** to achieve **high level of consistency, automation and accuracy** across all departments.
- 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



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

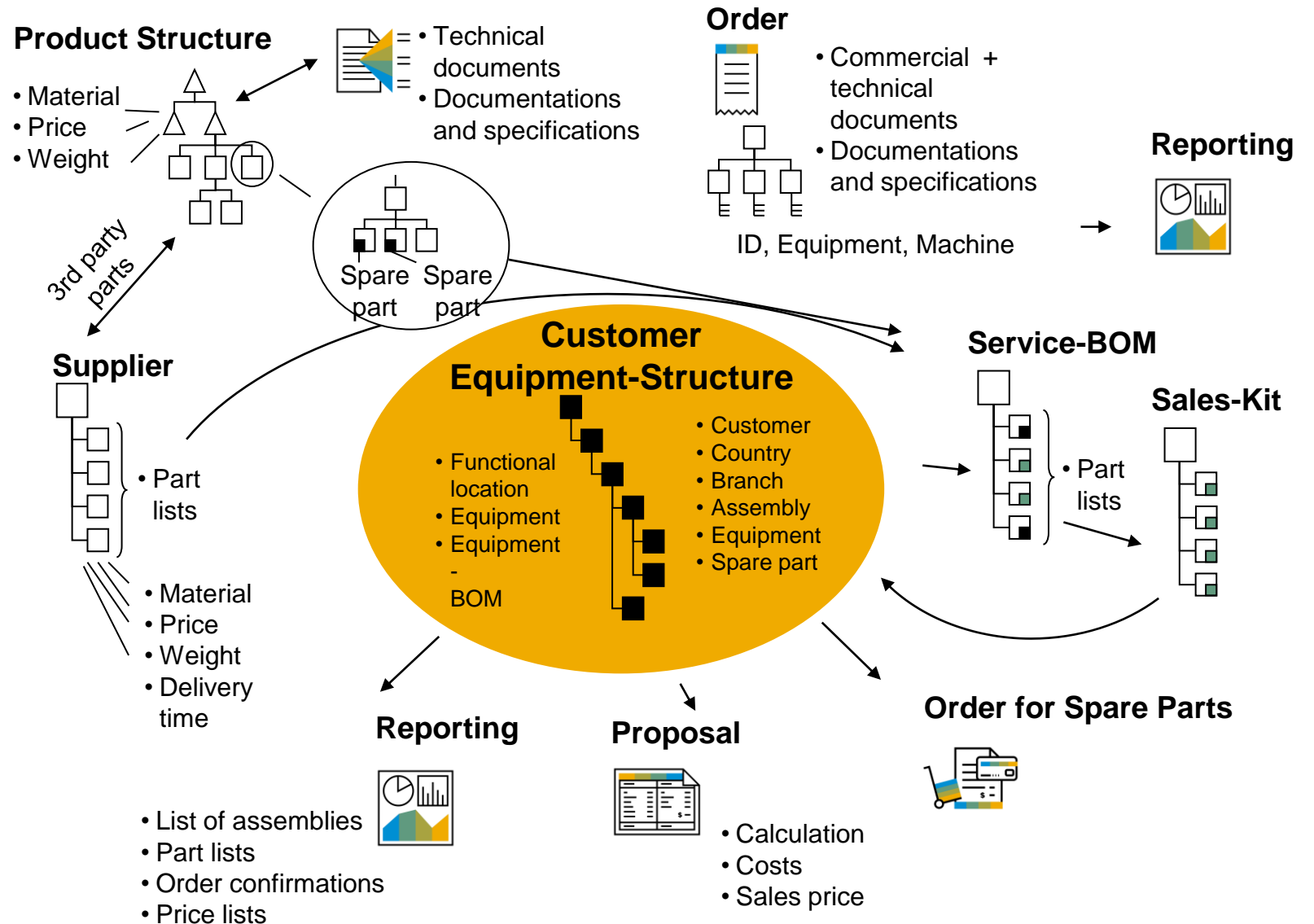
revolutionize product development and bring manufacturers, system operators, suppliers and service providers together and network them with one another.



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

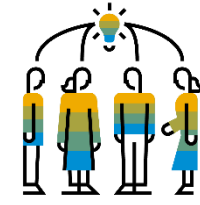


Digital Product Structure

Consume



Feed



Extended Enterprise...

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

Webinar 1 – Create Portfolio & Product Structure

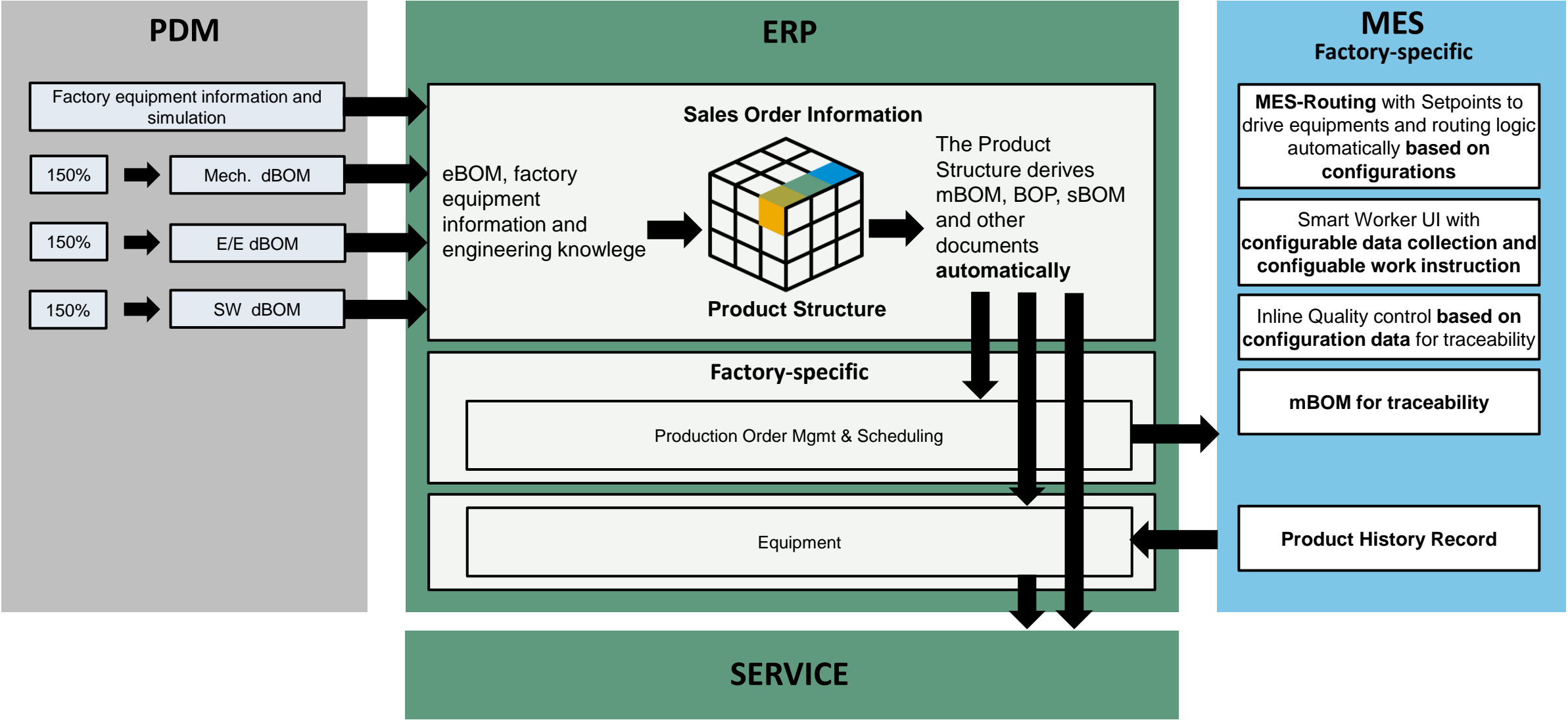
Webinar 1 – Consume in Sales

Webinar 2 – Consume in Manufacturing (01.04.2022)

Webinar 3 – Consume in Service (08.04.2022)

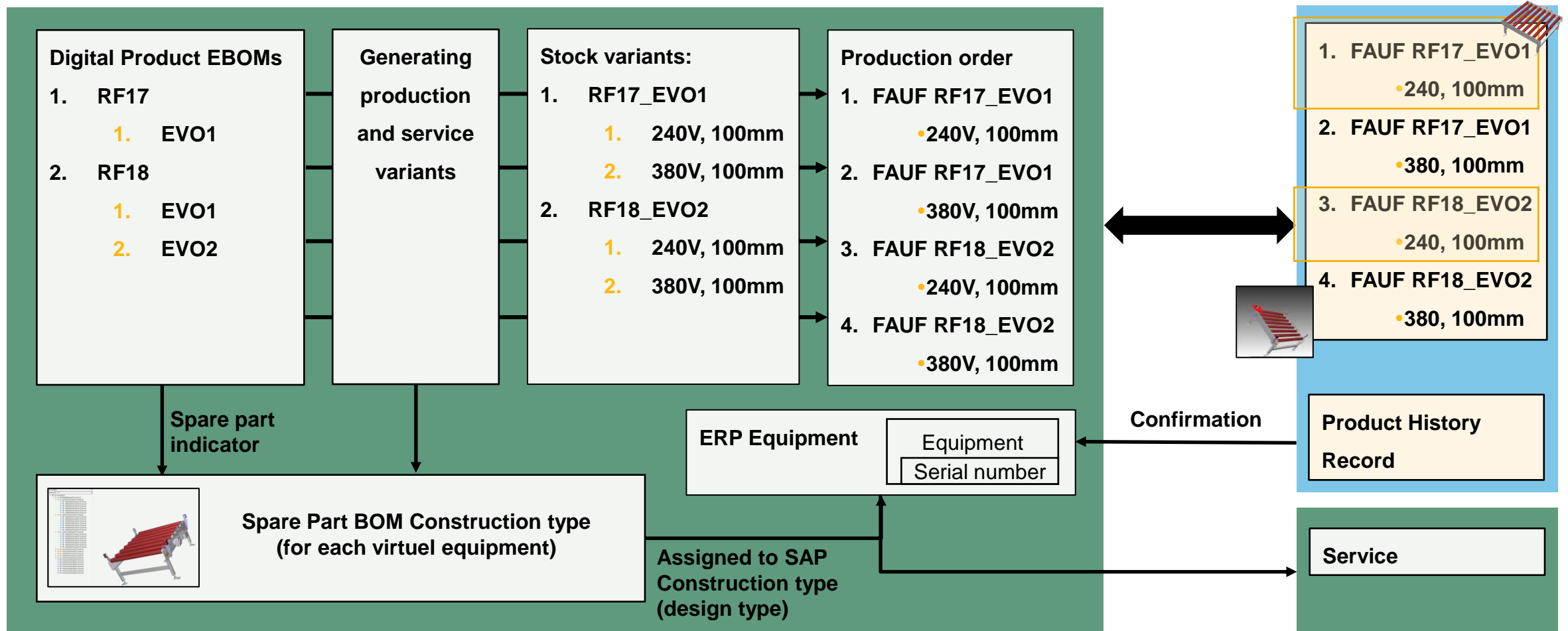
Automatically generated Engineering Data for Planning & Execution

Architecture

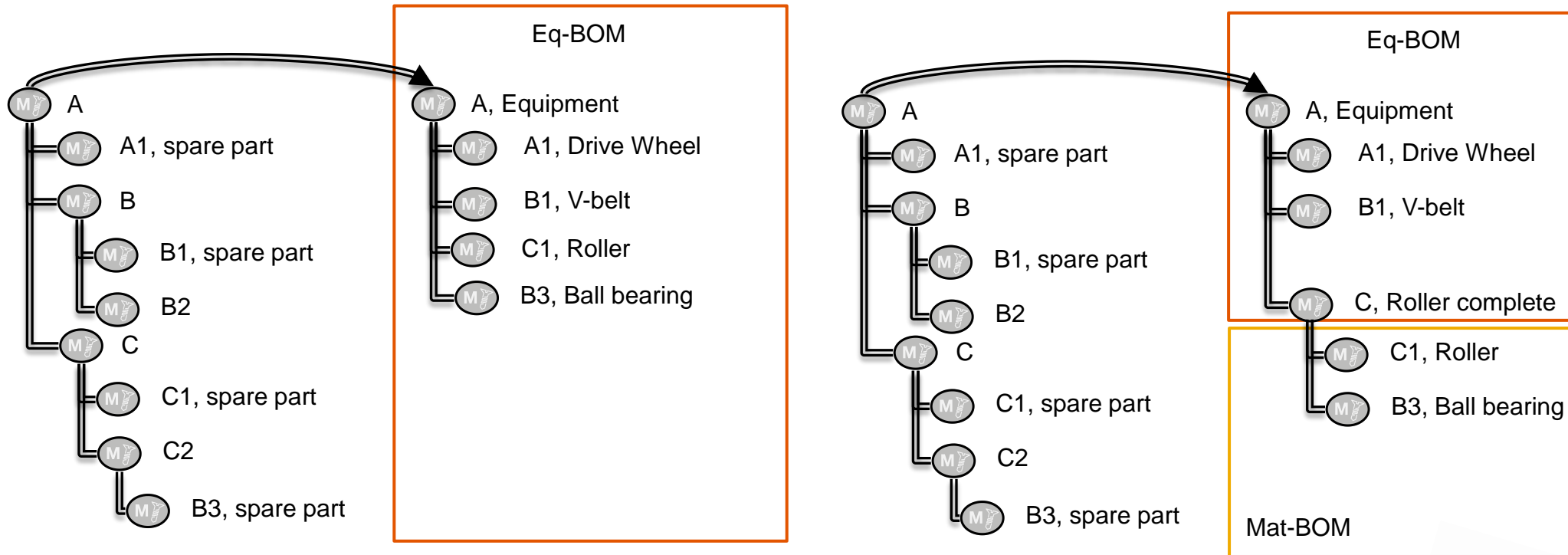


Hand over of Traceability Data to Service

Data model

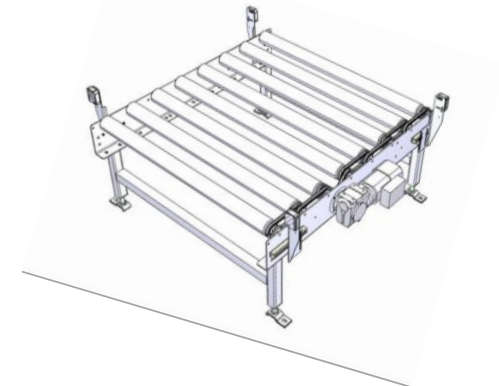


Product Structure Transformation in Service Engineering

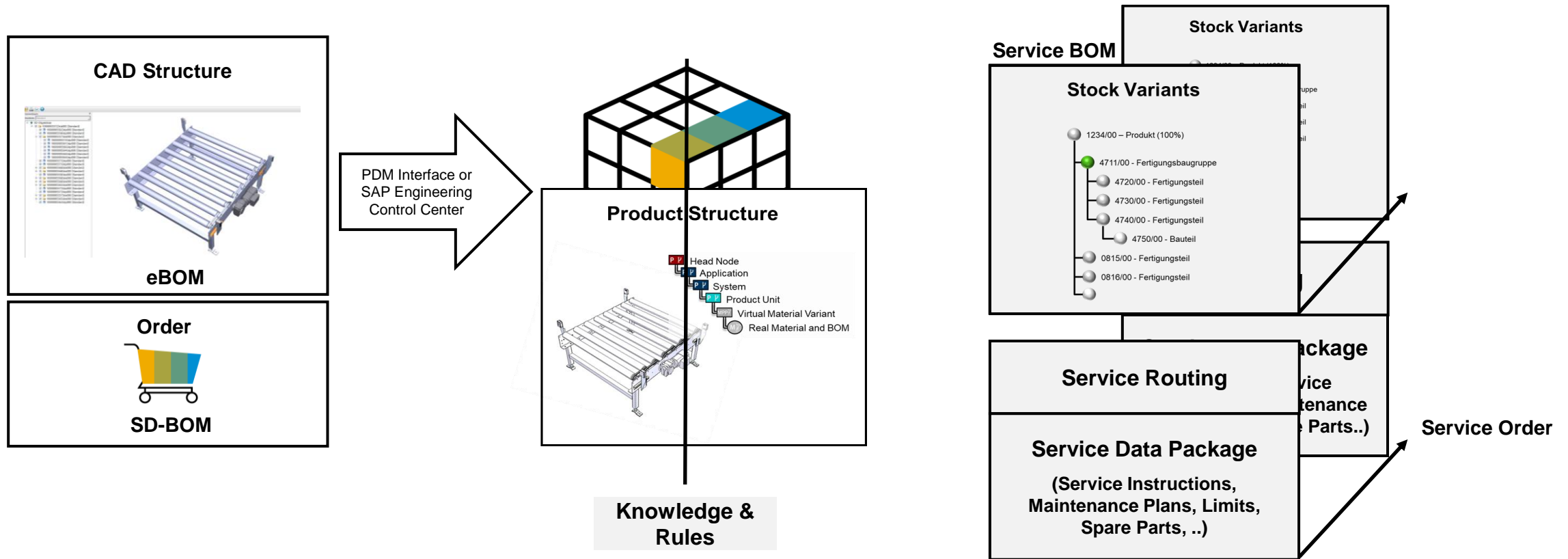


C is a spare part kit that is procured

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

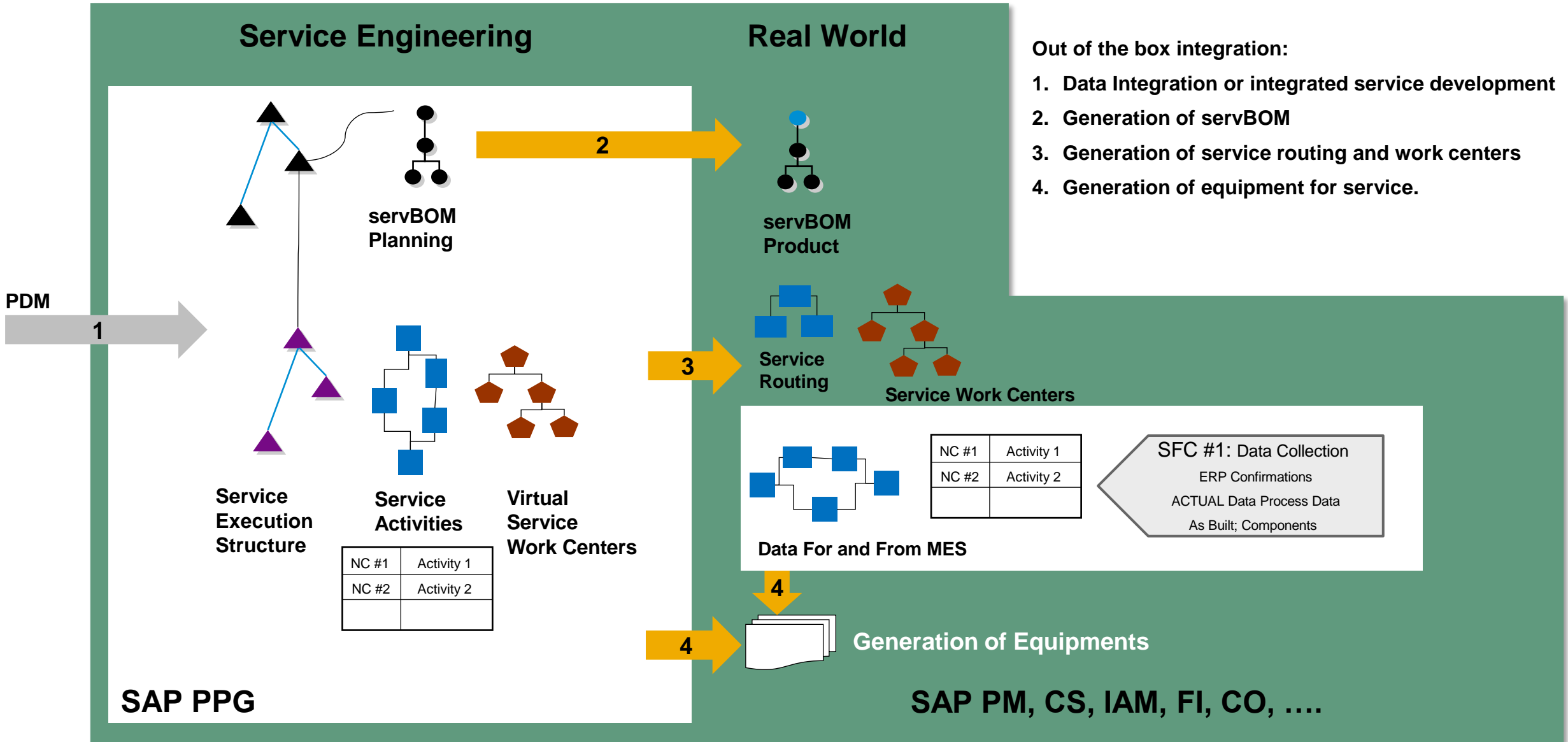


Review released product structure for service



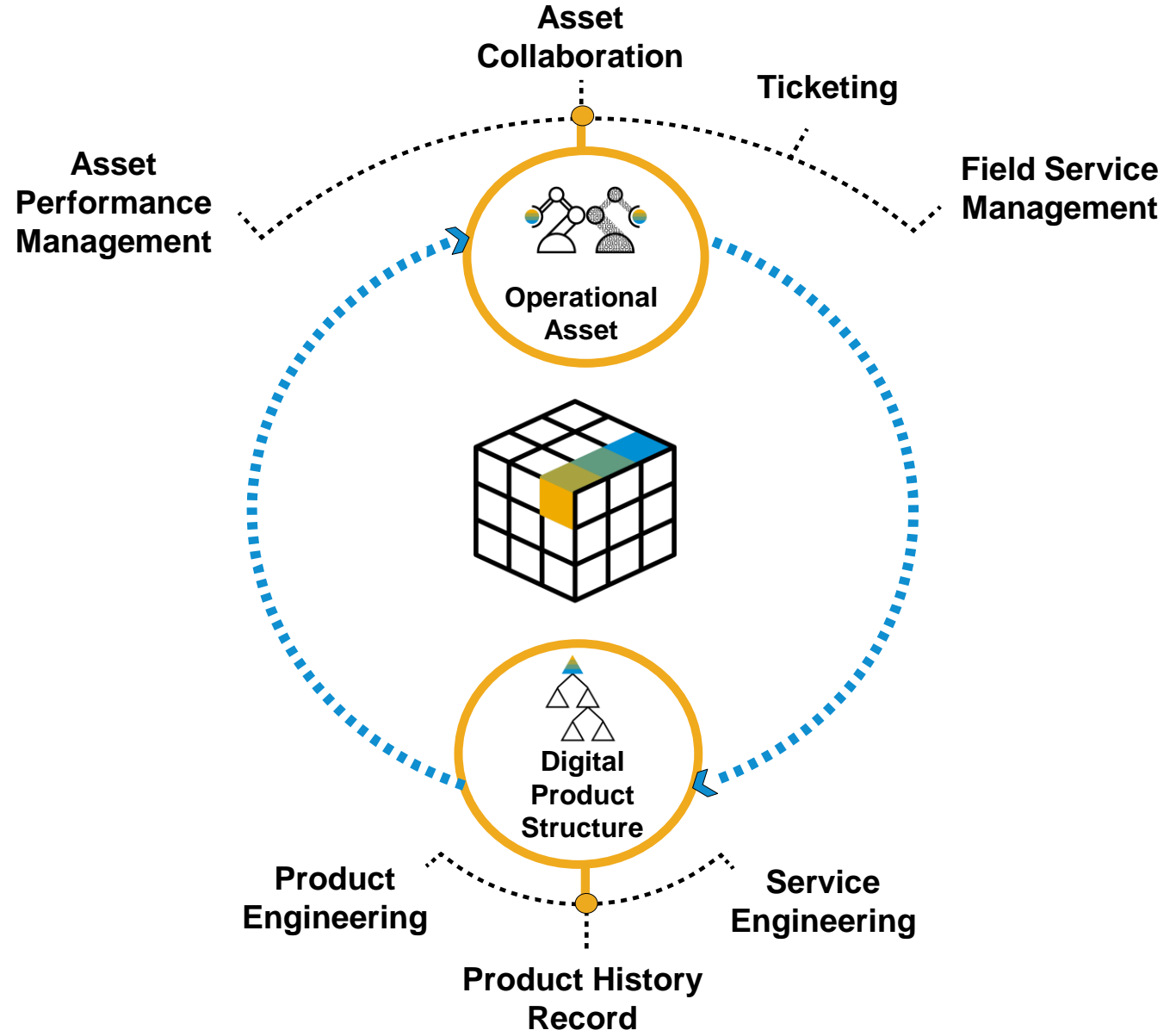
- The **Product Structure** contains different views for eBOM & service BOM.
- The **Product Structure** supports the service sales configuration (Webinar 1).
- In this webinar the **Product Structure** generates the **classic BOM models**, routings and other documents/settings for service.

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



“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: Field 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

- 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 Instruction

Inline Quality Management

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

Machine Integration

- Configuration specific machine control

Intelligent Asset Management

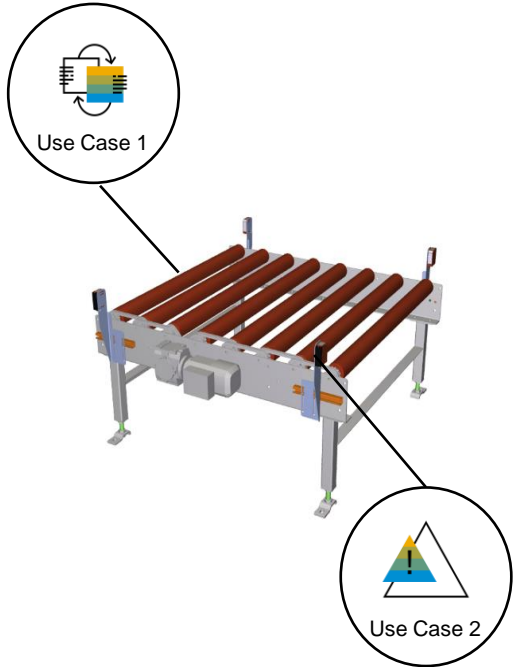
Providing the digital twin to internal and external collaboration partners IOT services

Service-Management

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

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

Conveyor Solutions AG



Gregor
Assembly Operator



Hannes
Service Engineer



Robyn
Service Operations



Keno
Service Technician

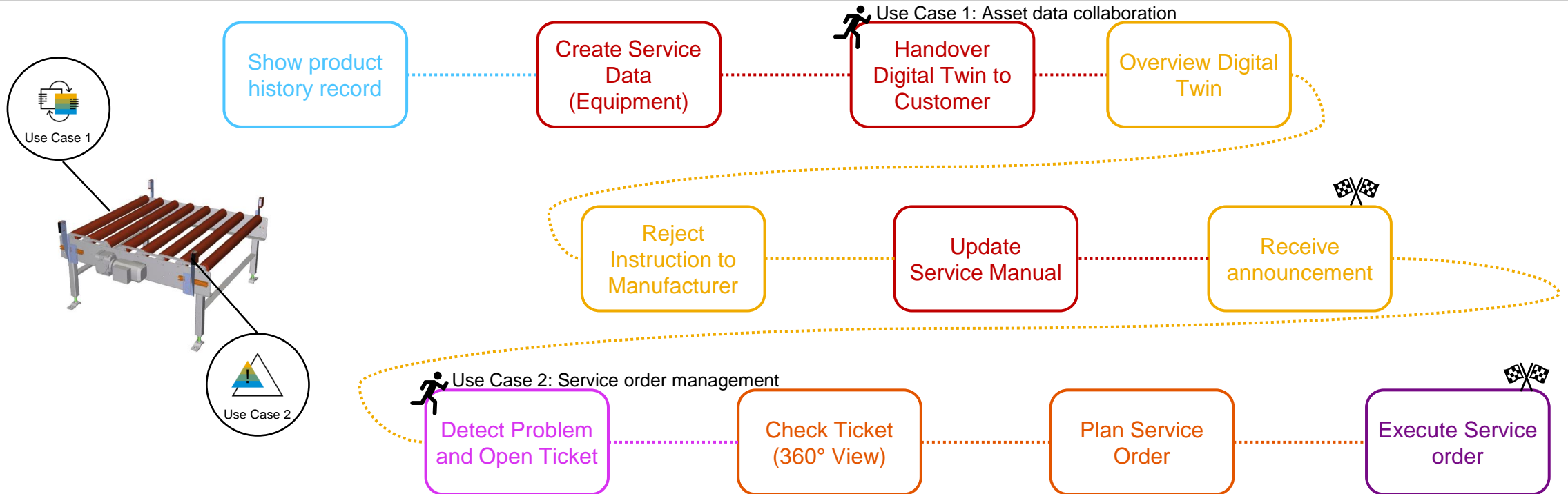
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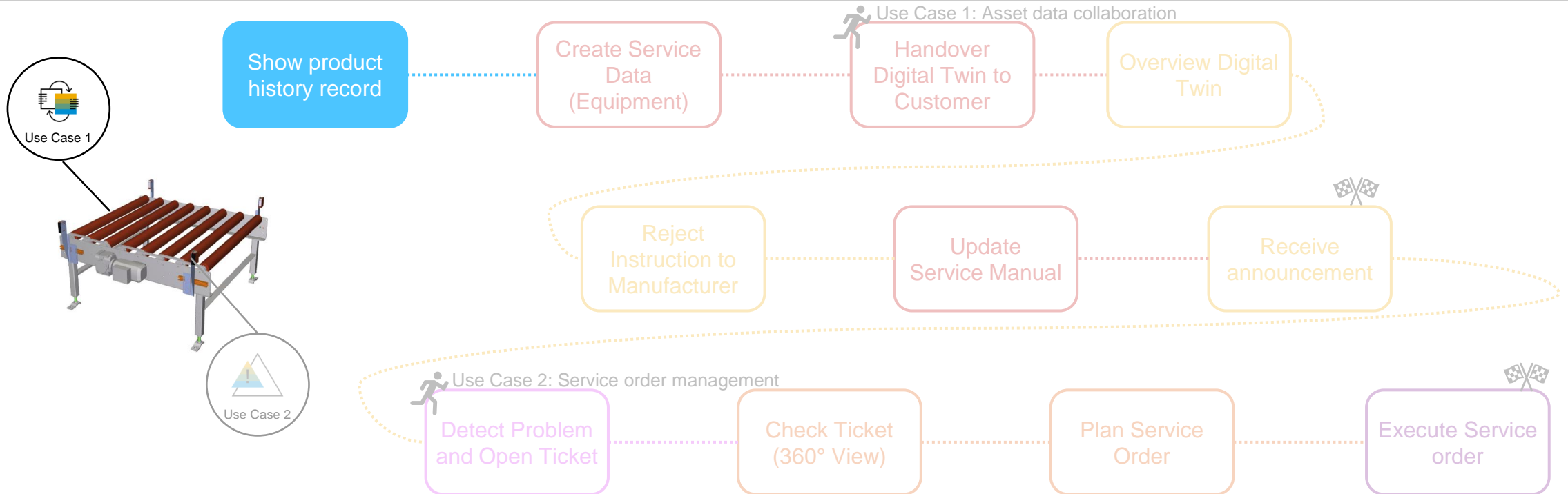
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Maintenance Operator



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

The screenshot displays the SAP Product Genealogy interface for Plant 2000. It shows the following information:

- SFC: 2000386** (Active)
- Produced By: Syntax Systems GmbH & Co. KG
- Plant: 2000
- Order: 100138
- Planned Batch: Actual Batch
- Planned Quantity: 1,000
- Actual Quantity: 66
- Data Collection: 66

General Information

- Material / Version: 209570 / 2
- Description: Roller conveyor
- BOM / Version: 209570_RF_380V / 1

Components (4)

Serial	BOM Components	Qty Assembled / Required	Operation Activity
10	209575 Description: Assembly group bent sheet metal	4,000 / 4,000	0010 Description: Montageanweisung
20	209579 Description: Conveyor 3 m/s	1,000 / 1,000	0010 Description: Montageanweisung
30	209577 Description: Engine 380V	1,000 / 1,000	0010 Description: Montageanweisung
40	209617 Description: Support	2,000 / 2,000	0010 Description: Montageanweisung

Component Details (209577 / 1)

General Info	Assembly Data
Actual Component: 209577	SERIALNUMBER: 54375843
Version: 1	
Quantity: 1,000	
Actual Operation: 0010	
Activity:	
Operation: Montageanweisung	
Description:	
Status: Active	
Assembly Date: Apr 7, 2022, 13:07:27	
User: P000120	

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

Conveyor Solutions AG



Gregor
Assembly Operator



Hannes
Service Engineer



Robyn
Service Operations



Keno
Service Technician

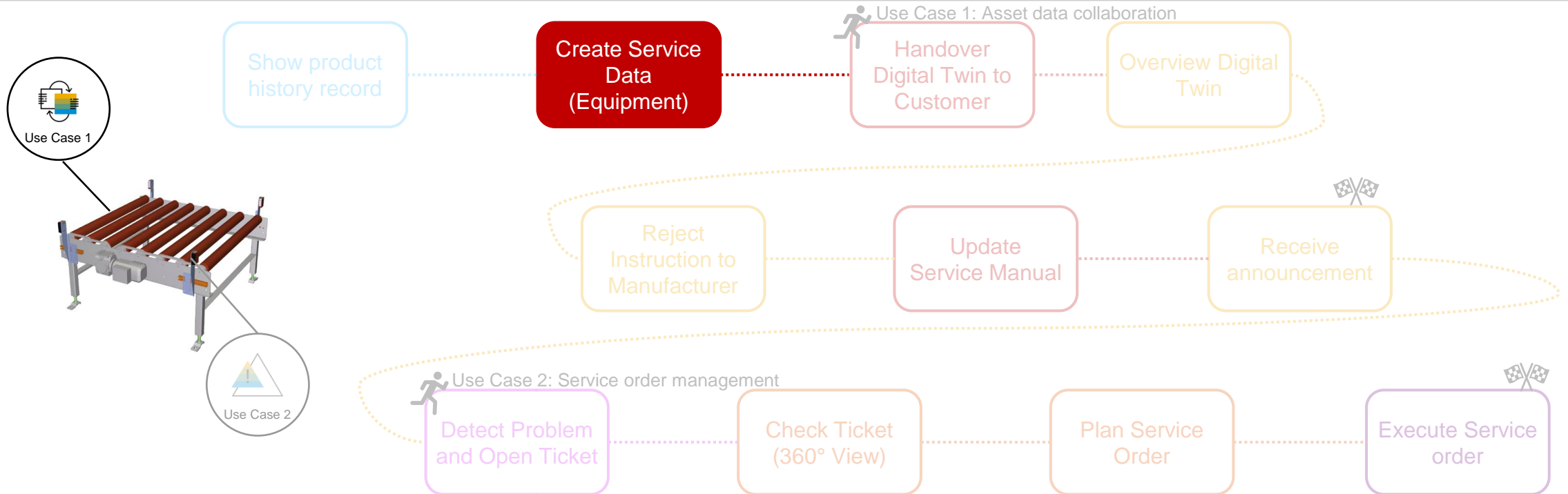
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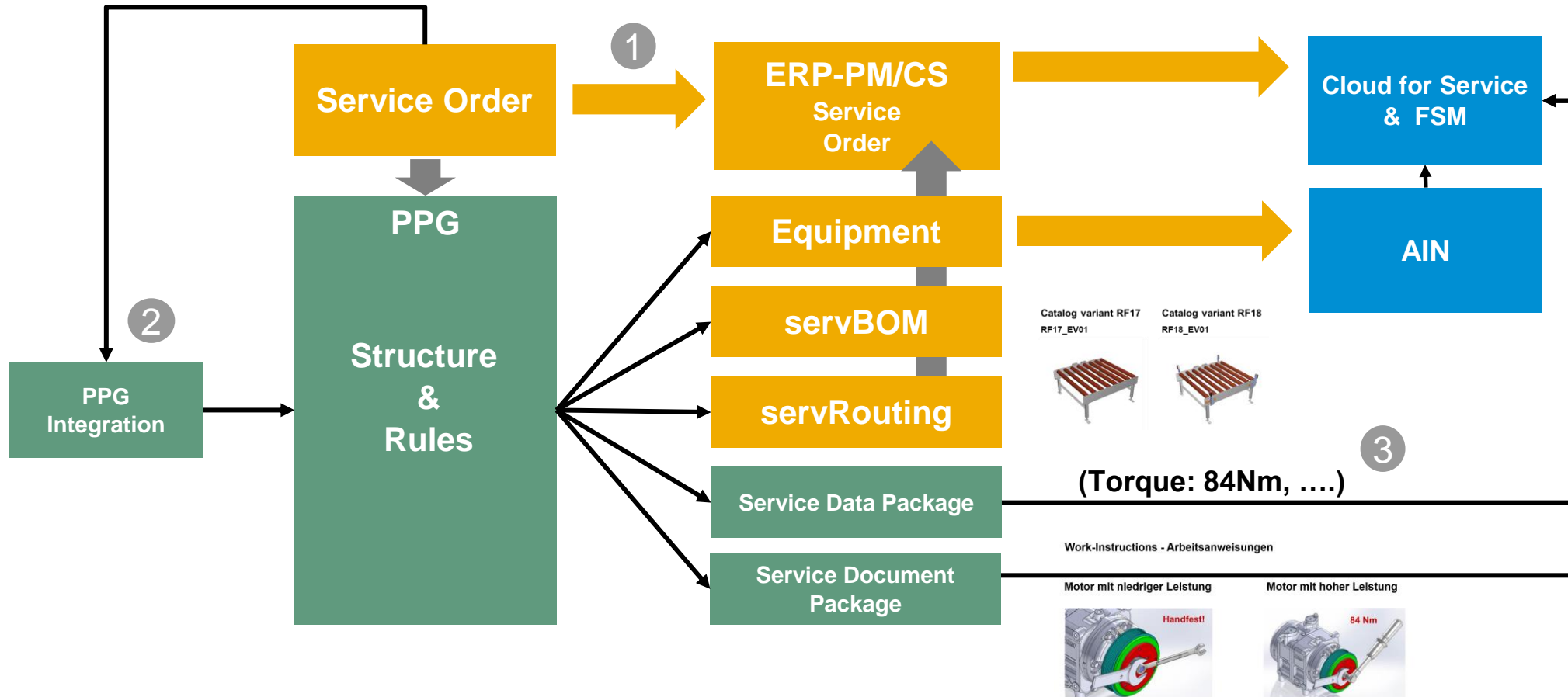
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Jana
Maintenance Operator



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.

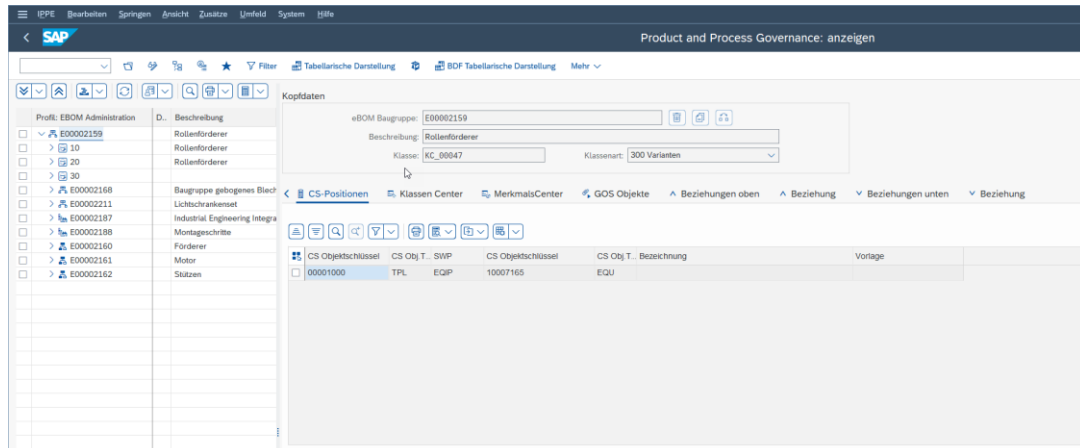
Create Service Data (Equipment)

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

Conveyor Solutions AG



Gregor
Assembly Operator



Hannes
Service Engineer



Robyn
Service Operations



Keno
Service Technician

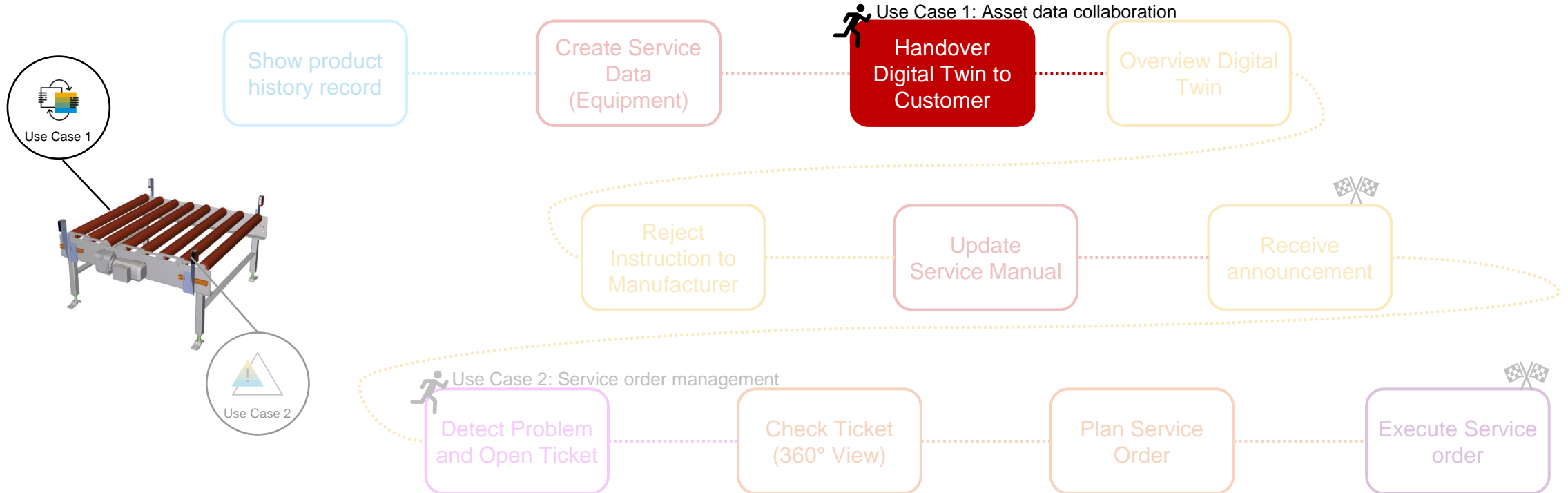
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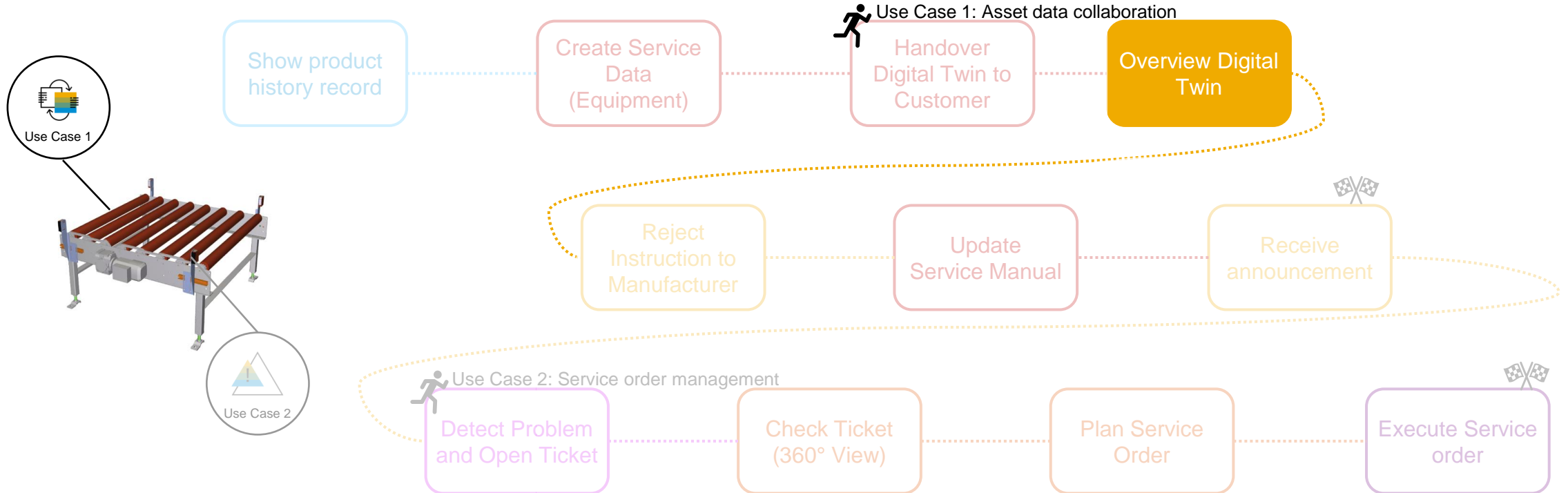
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Maintenance Operator



Overview Digital Twin

Business Outcomes

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



Isabell
Master Data Expert

The screenshot shows the SAP S/4 HANA Equipment view for a Roller Conveyor 240V LB. The interface includes a navigation pane on the left with a tree view of equipment objects. The main area displays a detailed view of the selected equipment, including a 'Highlights' section with progress bars for 'Equipment Issue', 'Instructions', and 'Documents'. Below this is a 'Documents' table listing various technical documents.

Document	File Name	File Type	Confidentiality	Phase	Category	Language	Source	File Size	From	Changed On
✓ E0002138_MATN	E0002138_MATN03	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	227 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN02	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	202 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN01	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	44 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN00	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN04	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN05	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN06	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN07	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN08	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN09	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
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✓ E0002138_MATN	E0002138_MATN16	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN17	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN18	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN19	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05
✓ E0002138_MATN	E0002138_MATN20	VCS			Drawing/Schemes	English	System Systems Grid & Co. AG	33 KB		2022-04-05

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

Conveyor Solutions AG



Gregor
Assembly Operator



Hannes
Service Engineer



Robyn
Service Operations



Keno
Service Technician

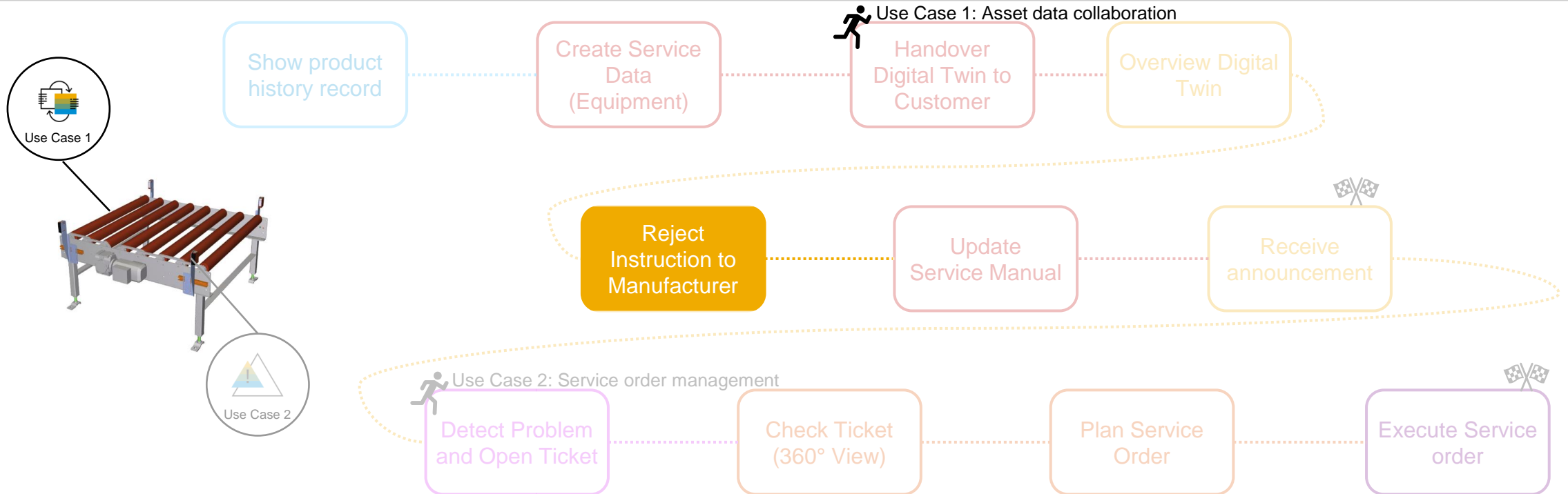
Green Foods Company



Isabell
Master Data Expert



Jana
Maintenance Operator



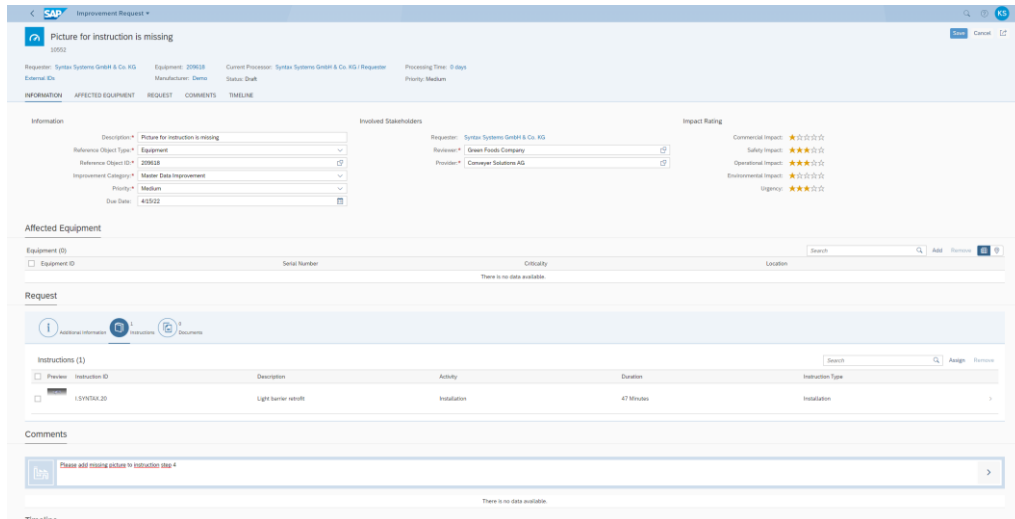
Reject Instruction to Manufacturer

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.”



Isabell
Master Data Expert



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

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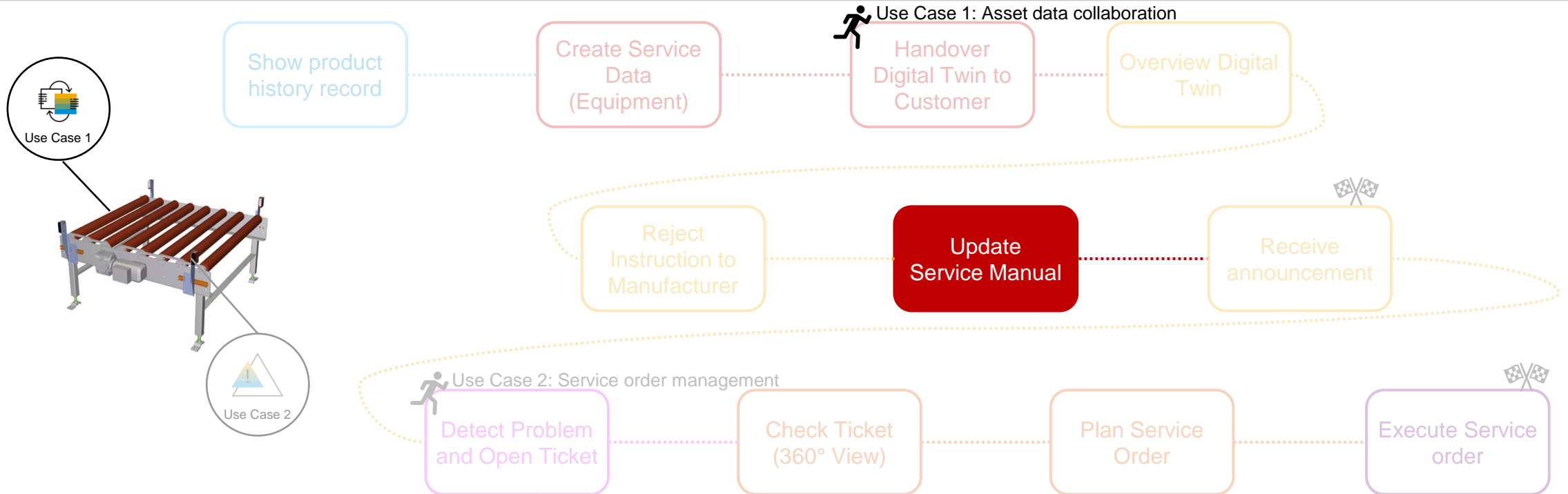
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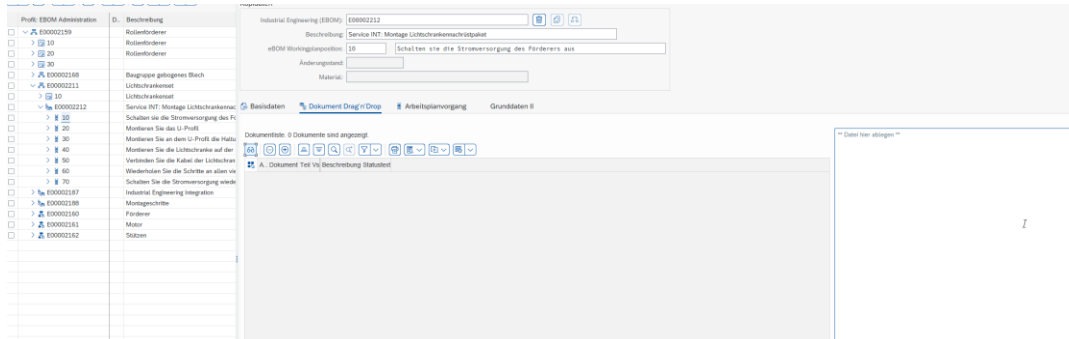
Update Service Manual

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



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Assembly Operator



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Service Engineer



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Service Operations



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Service Technician

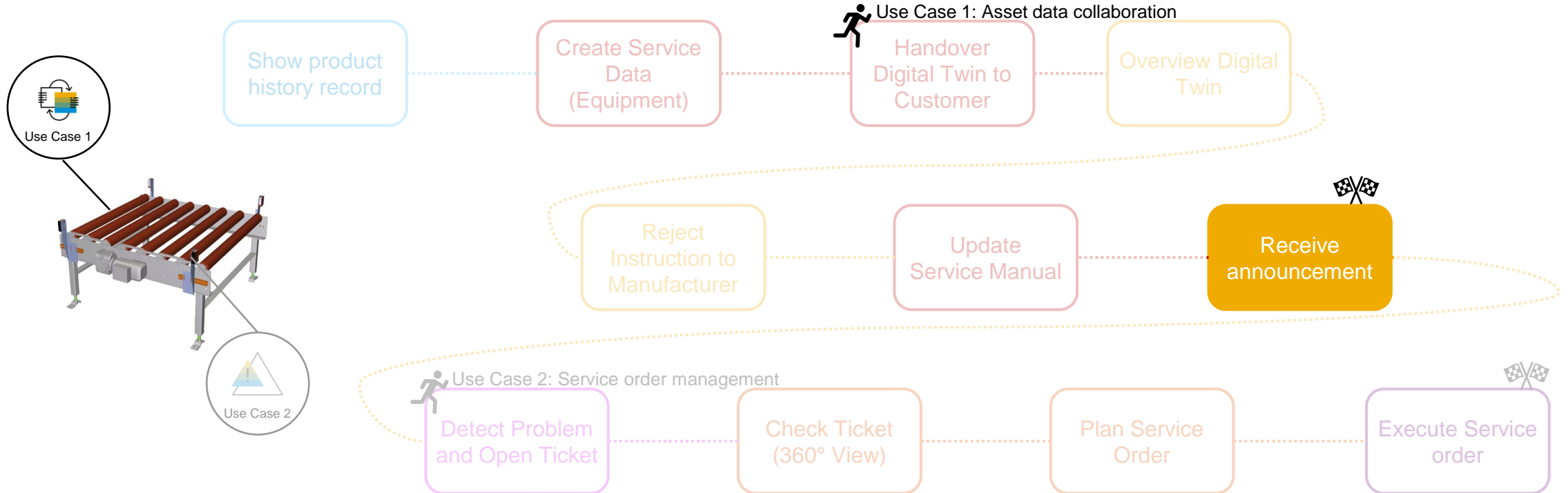
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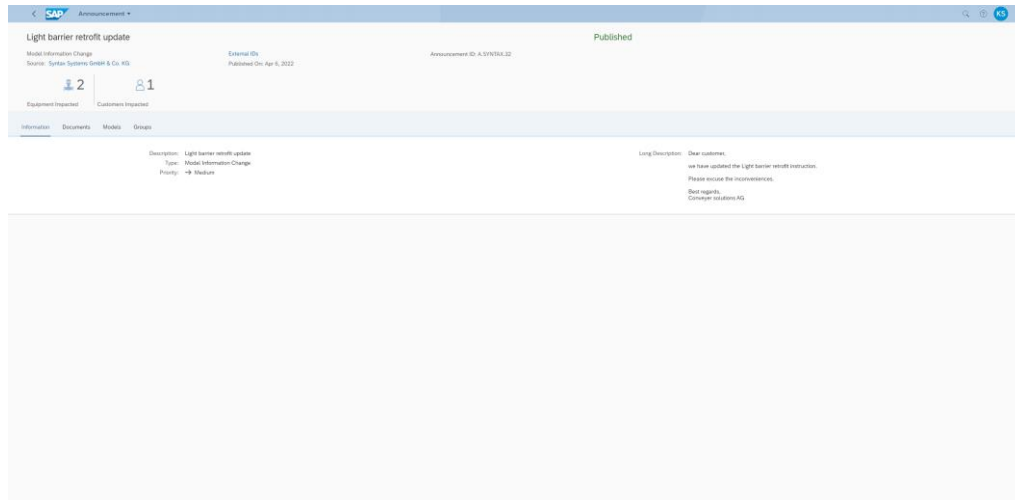
Receive announcement

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

Conveyor Solutions AG



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Assembly Operator



Hannes
Service Engineer



Robyn
Service Operations



Keno
Service Technician

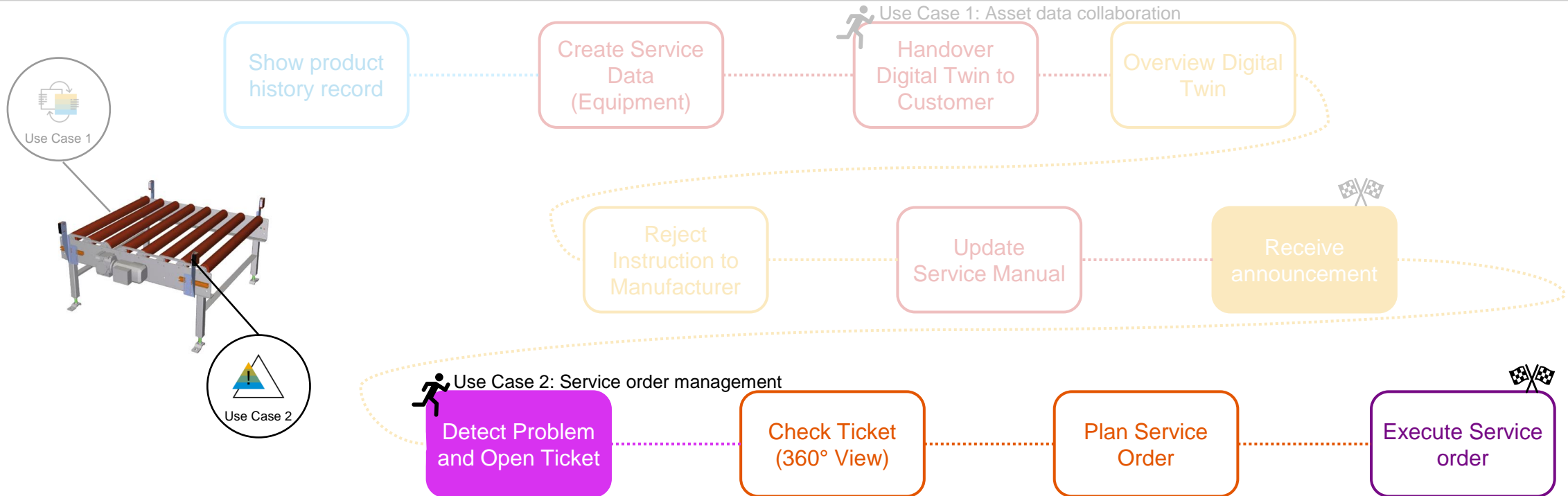
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Master Data Expert



Jana
Maintenance Operator



Detect Problem and Open Ticket

Business Outcomes

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



Jana
Maintenance Operator

The screenshot shows the SAP Equipment maintenance dashboard for a 'Roller Conveyor 240V LB'. The interface includes a navigation bar with tabs for INFORMATION, STRUCTURE & PARTS, DOCUMENTATION, INDICATORS, MAINTENANCE & SERVICE, ANALYTICS, and TIMELINE. A table displays indicator data:

Indicator	Value	Trend	Date and Time	Threshold Status	Type	Indicator Group	Provider	Content	Form	My Favorites
Light barrier sensor	0		Apr 6, 2022, 2:23:30 PM	Exceeds threshold	Indicator	RollerConveyor	Sytron Systems GmbH & Co. KG			

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**

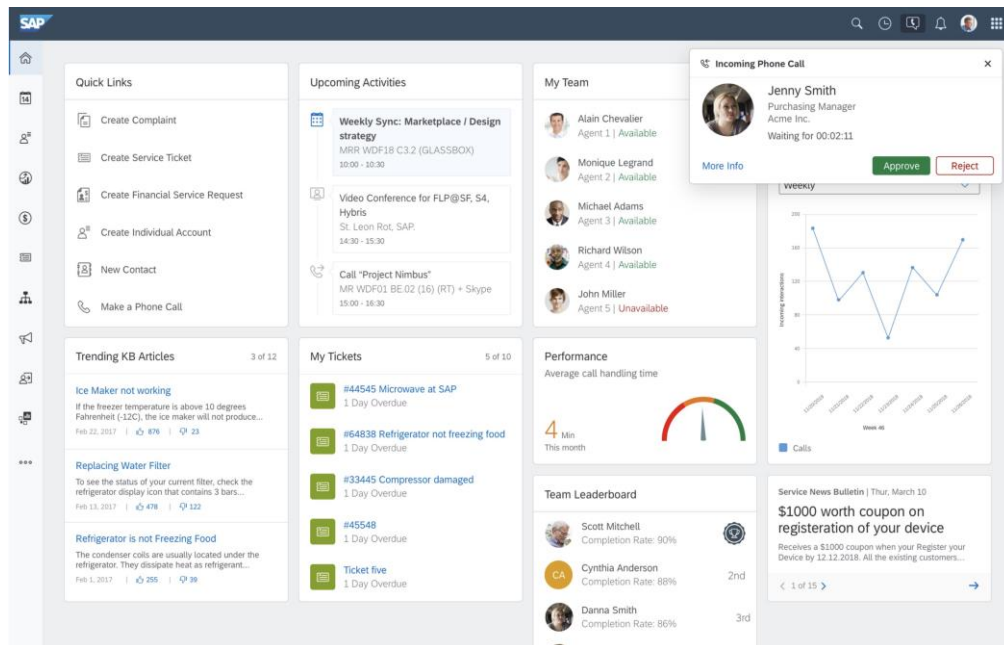
Check Ticket – 360° View

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

Process Flow: From Manufacturing to Service

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Assembly Operator



Hannes
Service Engineer



Robyn
Service Operations



Keno
Service Technician

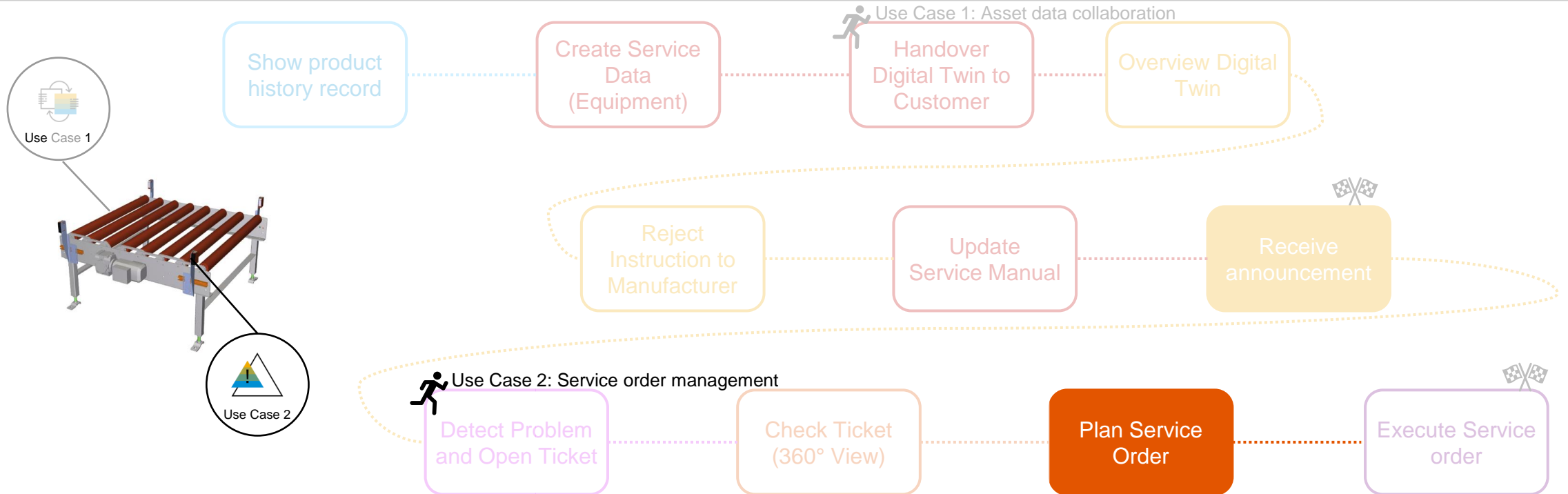
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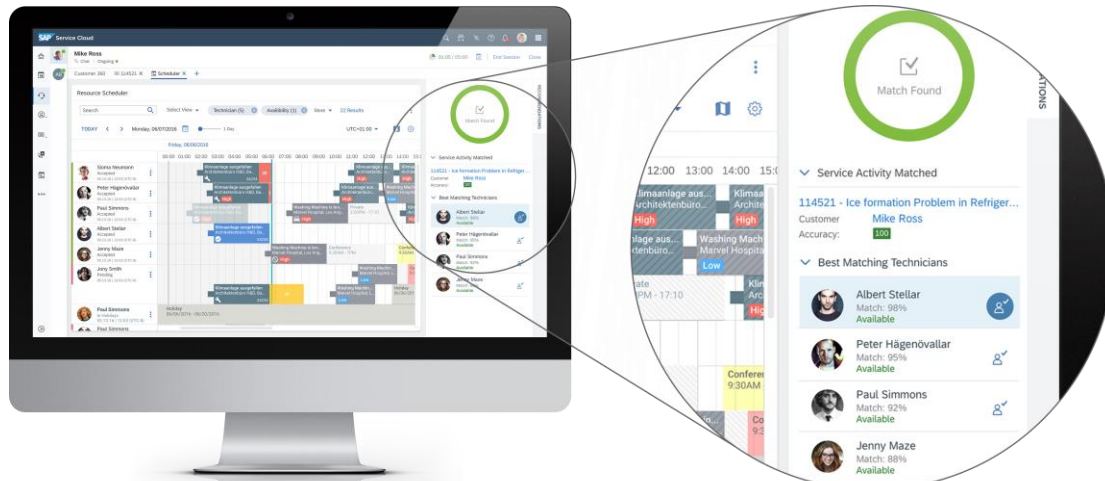
Plan service order

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

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

Process Flow: From Manufacturing to Service

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Service Operations



Keno
Service Technician

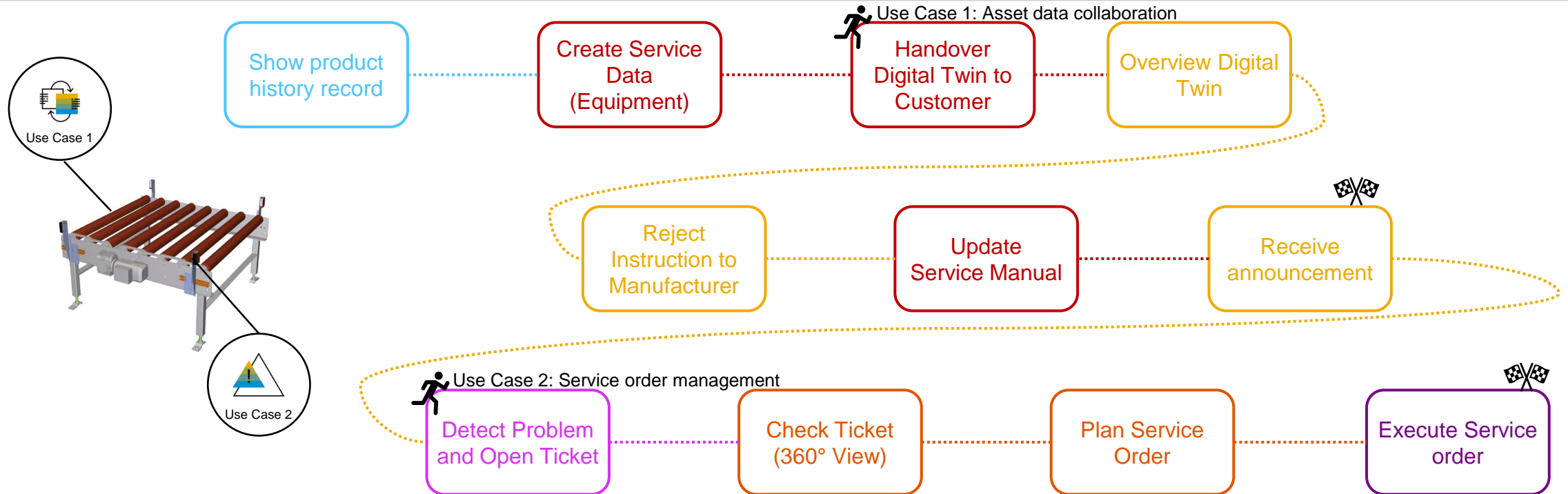
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Maintenance Operator



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.



A woman in a blue uniform and safety glasses is working on a large industrial machine in a factory setting. She is holding a red flashlight and a blue component of the machine. The background shows various industrial equipment and structures.

Design-Driven Enterprise im Projektgeschäft

From Bid to Design & Procurement

14.04.2022

Thank you & see you soon.

Contact Information:



Sunita Mathur
Business Development
Digital Supply Chain

SAP | M.: +43 664 8289569
Email: sunita.mathur@sap.com
LinkedIn: [Sunita Mathur](#)



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