

Design-Driven Enterprise From Manufacturing to Customer

For custom-engineered projects (ETO)



29.04.2022

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**

Now we focus on **their project business** unit.

Can they use the same **standard service system** to service custom-designed solutions, which was chosen for their configurable products business?

(See webinar 3 for the configurable service scenario)

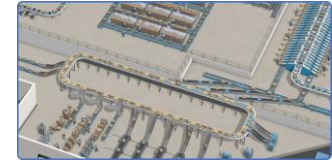


**What capabilities are required to solve
Conveyor's business challenges?**



DESIGN-DRIVEN ENTERPRISE

Engineer to Order (full scope)



BID PURCHASE

BID

- Inquiry Intake
- Design Collaboration with Customer
- Quotation Specification
 - Receive und store customer requirements.
 - Create BID-TOS (from Template, from scratch or from Excel-Input).
 - Create Solution proposal (Drawings, Specs, etc) und send them to the Customer by Document Control Center (Collaboration).
 - Negotiation of the solution proposal.
- Quotation Costing
 - Start Easy-Cost Planning
 - Calculate cost
 - Create a SAP offer/bid (SD – based on commercial product) and do the pricing based on the calculated costs.

PURCHASE

- Design & Purchasing Collaboration with Supplier

TECHNICAL PLAN

TECHNICAL PLANNING

- Basic Design for all disciplines
- Create Layouts for the plant
- Proof the bid content
- Define activities for quality and material management

ORDER FULFILLMENT

- Create customer related to quotation
- Fine tuning of work breakdown structure, the TO and its links (Networks, Milestones)
- Detailed scheduling of the project (PS)
- Cost estimation based on networks and its activities
- Cash management, invoice and billing plans, down payment processing
- Budgeting
- Release of structures (Project versions)
- Execute first down payments (if required)

ENGINEER

TECHNICAL DESIGN

- Detailed Design for all disciplines
- 3D-mechanical engineering with PLM-direct integration
- Material take out
- Planning of production 6 procurement (PS)
- Collaboration with customer & suppliers
- Release of documents for next phase
- Manufacturing Work Instructions, Routing, Quality management
- Service-BOM, Documents, Planning

ORDER FULFILLMENT

- Release Advance Procurement
- Invoicing of Suppliers
- Confirm engineering hours
- Concurrent project costing
- Claim management

PURCHASE PLAN

PLANNING

- Release Engineering position in TOS for production or procurement (growing structure)
- Integration of TOS and project management creates automatically production and procurement orders
- Costing based on the now available product information
- Scheduling of production orders and procurement orders
- Capacity analysis and optimization of production (PS-PPDS)
- Hand-over production orders to MES
- Change Management
- Track procurement orders

MANUFACTURE

ORDER MANAGEMENT

Release of production orders

ASSEMBLY

Work Instruction

INLINE QUALITY MANAGEMENT

Recording of data collection in the product history record (digital twin)

MACHINE INTEGRATION

DELIVER INSTALL INVOICE

DELIVERY

- Delivery directly from the project
- Dispatch and transport processing
- Site Processing
- Confirmations
- Procurement of Installation Material and Services
- Project/Site Controlling
- Invoicing (vendor)
- Billing (Customer)
- Cash-Management

ORDER FULFILLMENT

- Release Advance Procurement
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- Claim management
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- Analysis based on POC (Percentage of Completion)
- Final Billing to Customer

OPERATE

INTELLIGENT ASSET MANAGEMENT

Providing Digital Twin (as installed, as maintained) to service providers and IOT services

SERVICE MANAGEMENT

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

Creation of Service Data for each project

Digital twins

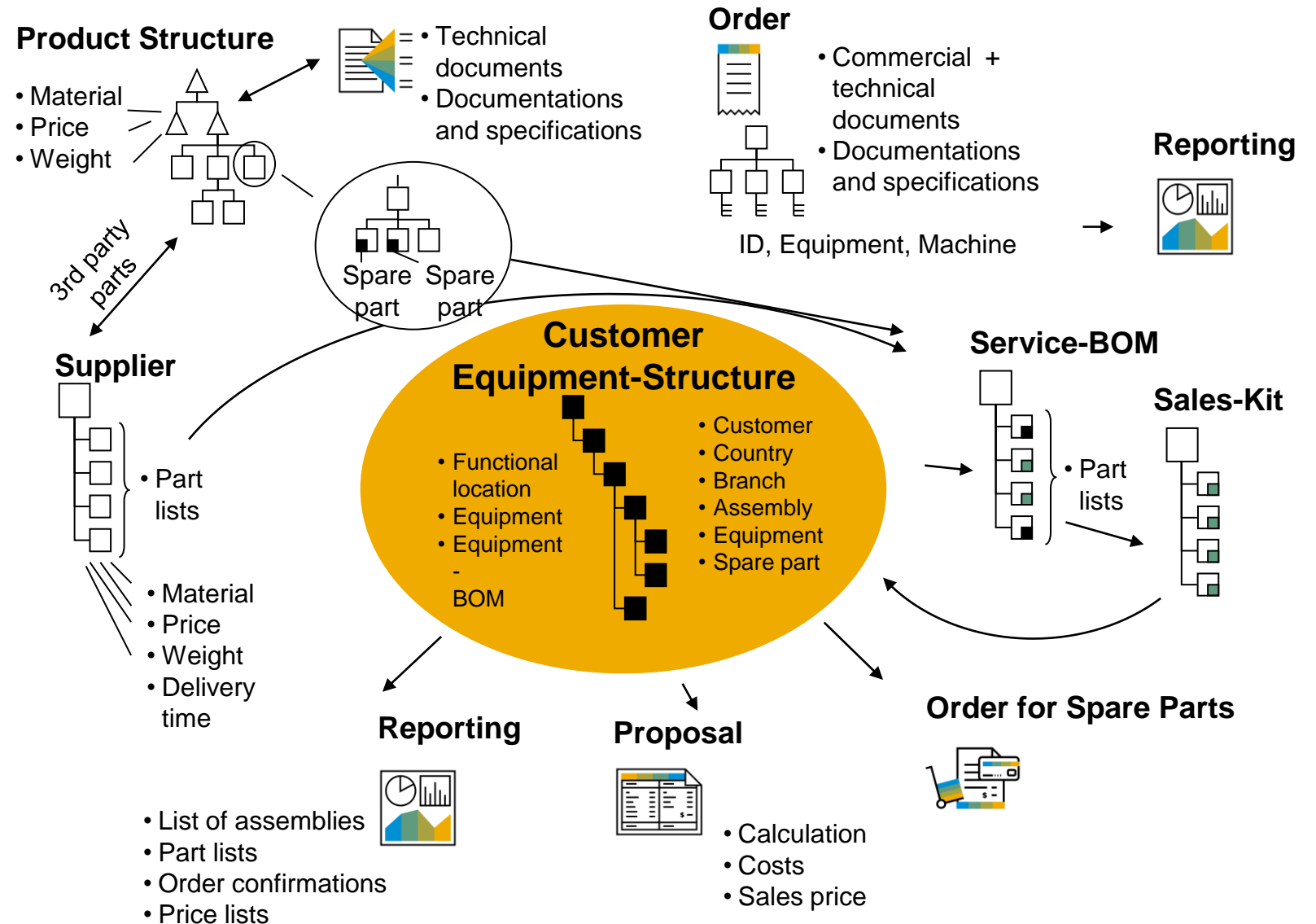
revolutionize product development and bring manufacturers, system operators, suppliers and service providers together and network them with one another.



Service Engineering for each project:

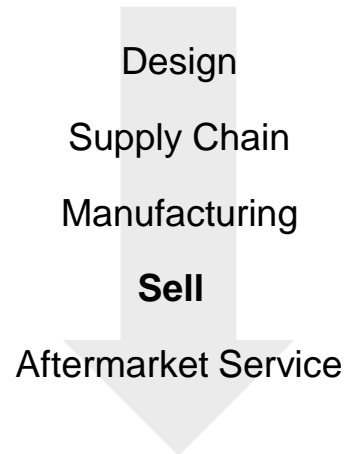
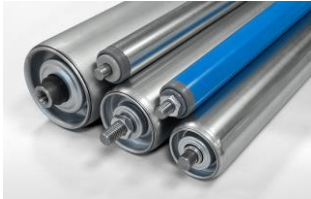
The Product Structure creates master data, documents and data to make it easy to manage the digital twin for products and services.

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

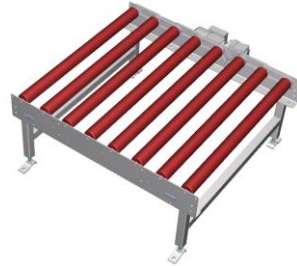


Different Products – Different Value Chains – Different Processes

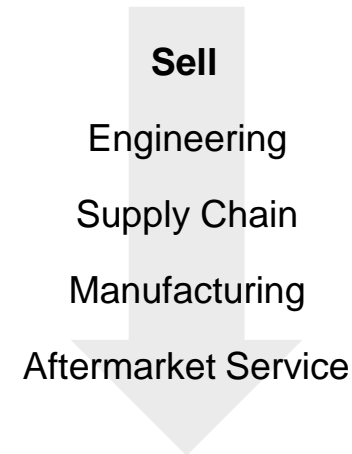
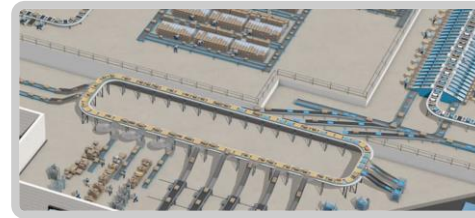
MTS
Make-to-Stock



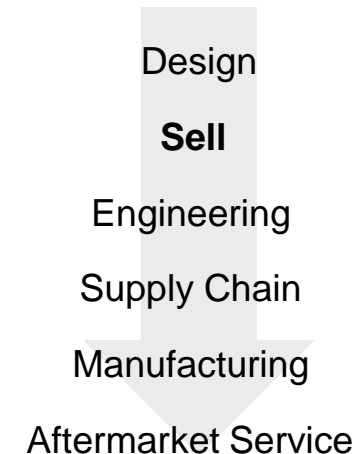
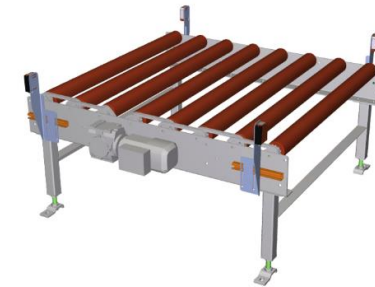
CTO
Configure-to-Order
closed



ETO
Engineer-to-Order

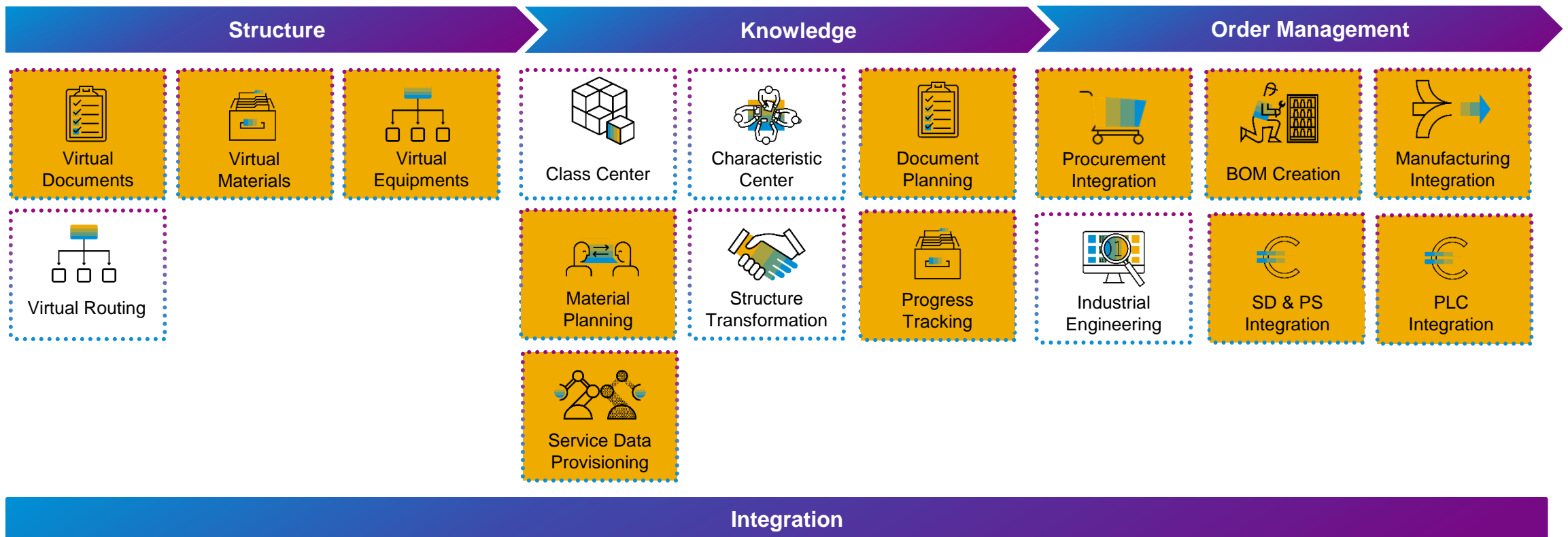


CTO+
Configure-to-Order
open



The **business processes in SAP PPG** are designed to help our customers address the needs of the design-driven enterprise.

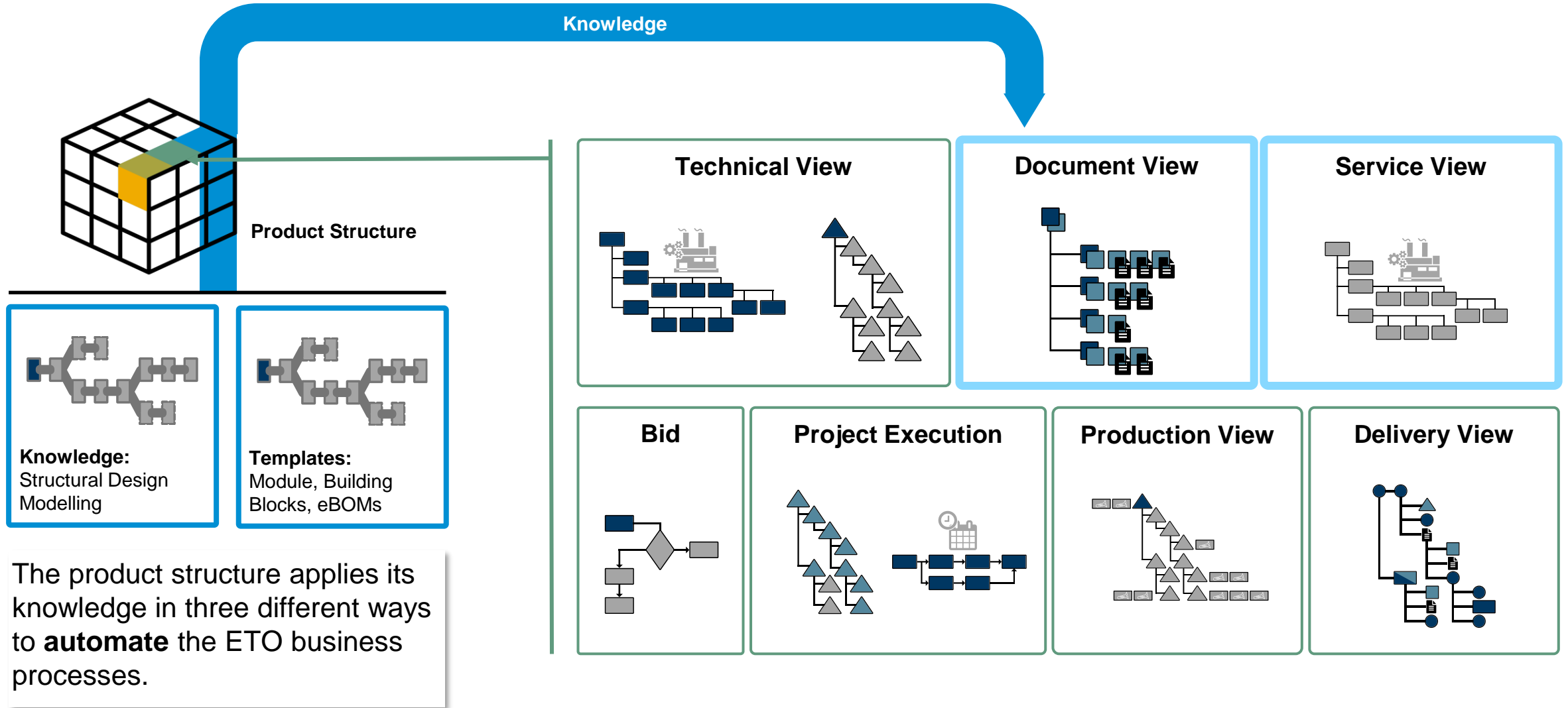
Business Processes in SAP Product Process and Governance



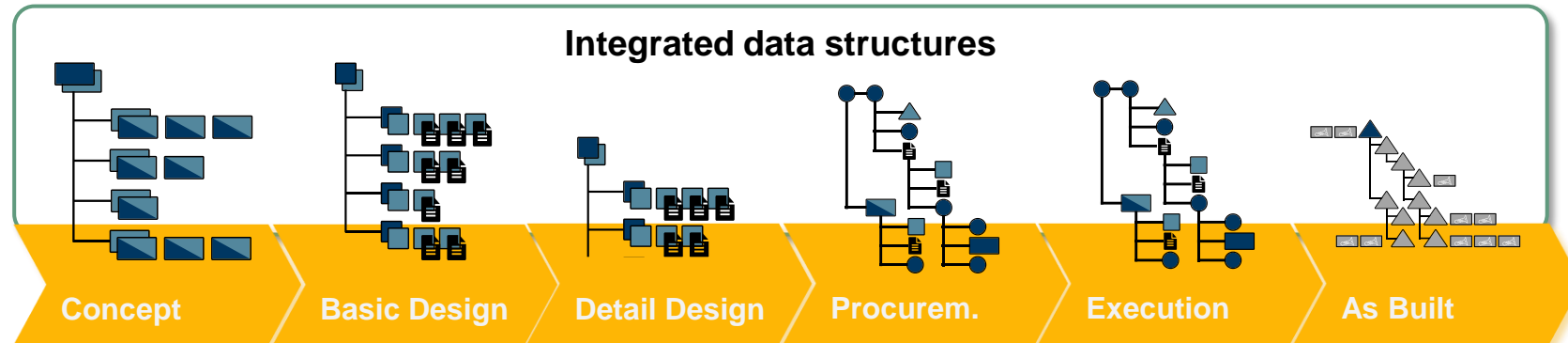
Integration

SAP EPD | SAP ECTR | SAP Teamcenter by Siemens

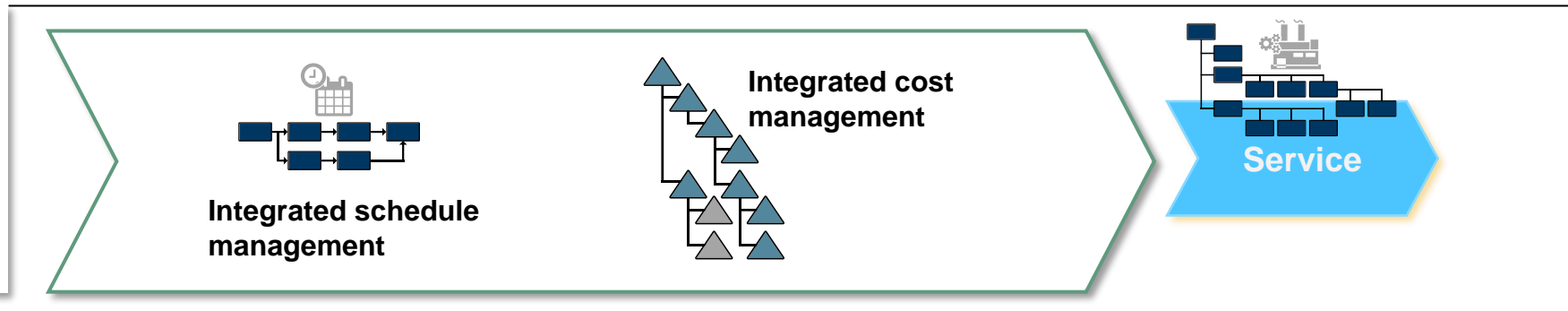
Design-Driven Enterprise: Product Structure Automation



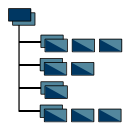
Design-Driven Enterprise: Product Structure Integration



The product structure knowledge results in **seamless integration and automation** of the ETO process.



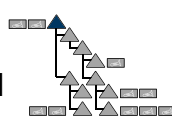
View:
functions



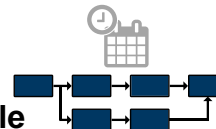
View:
documents



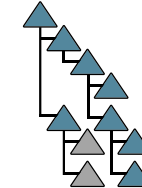
View:
material



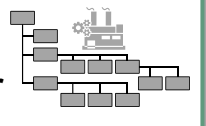
View:
schedule



View:
costs

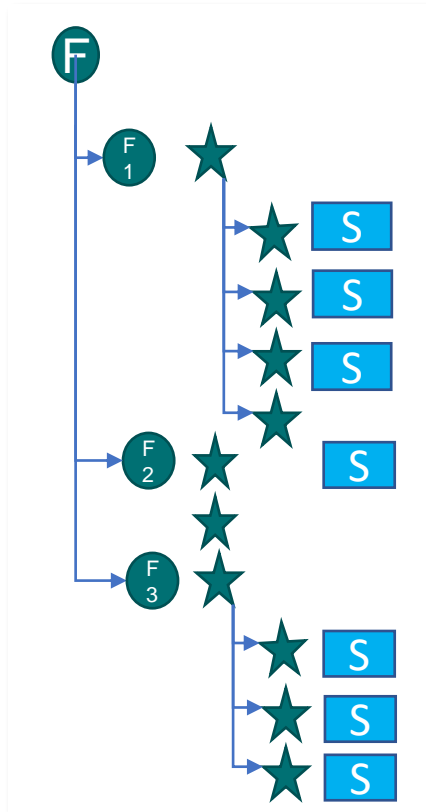


View:
customer



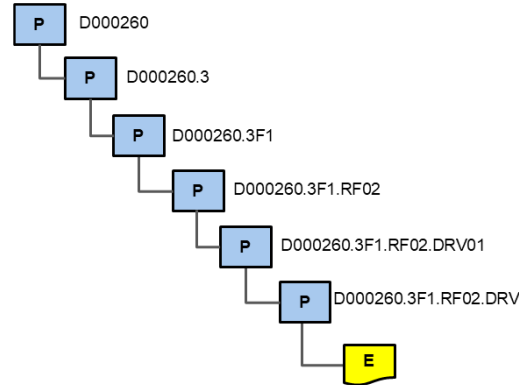
What service data do we need?

Digital Twin



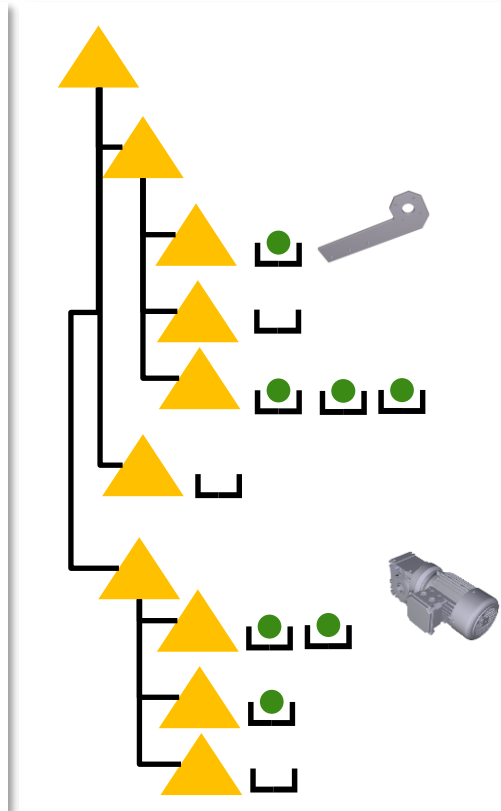
F- Functional location and equipments
 Stars - equipment
 S - spare parts:
 • Equipment BOM
 • Build type BOM

Customer Documentation



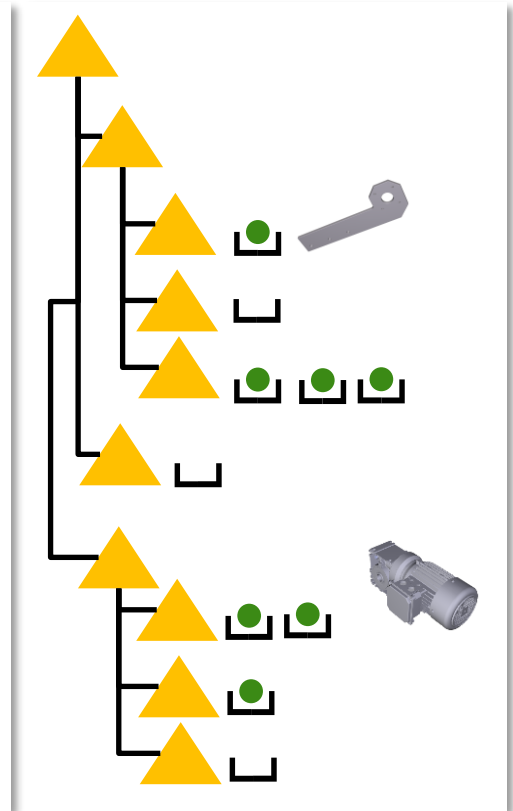
Documentations and document-structures for digital twin

Master Parts List



MPL describes which spare parts are recommended and alternatives.

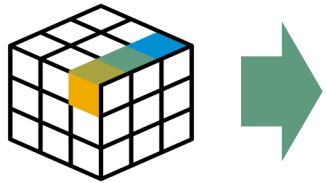
Spare Parts Catalog



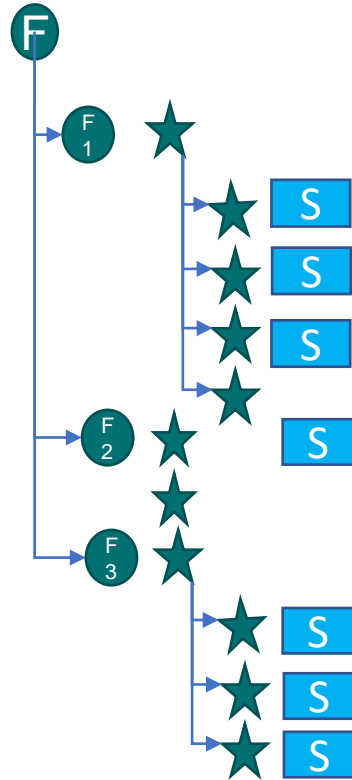
General spare parts catalog without reference onto the digital twin

How to create service data efficiently?

Product Structure

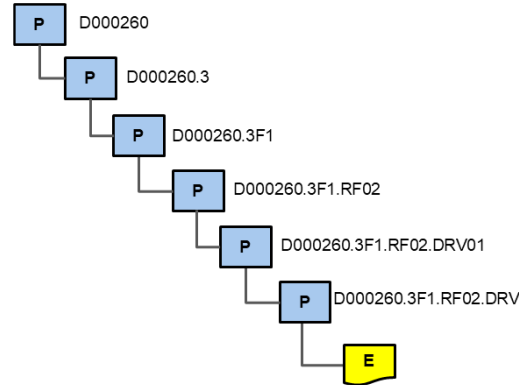


Digital Twin



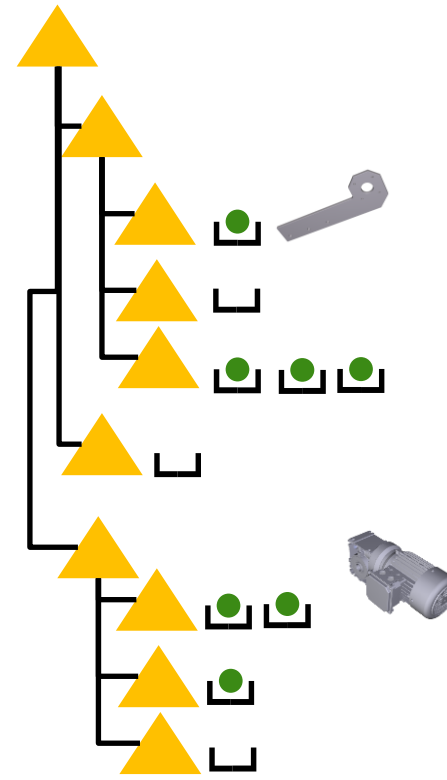
The TOS generates automatically virtual functional locations and equipments. Blue boxes see slide 14 for detail.

Customer Documentation



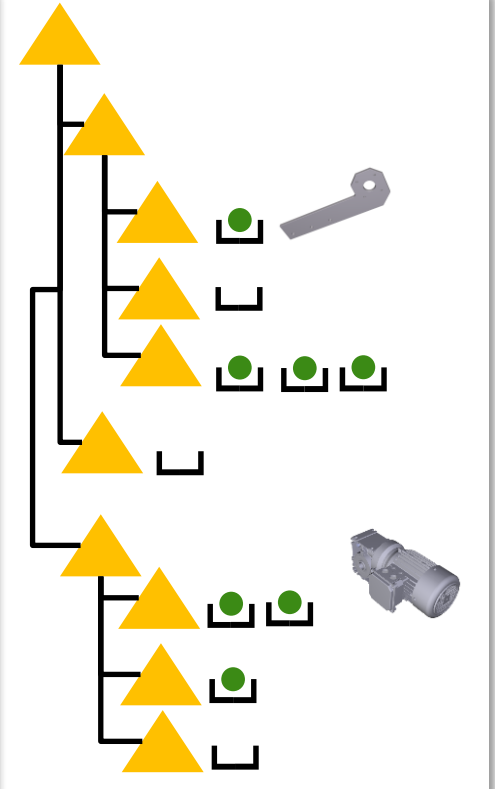
The document structure is generated automatically by applying classifications and horizontal object links.

Master Parts List



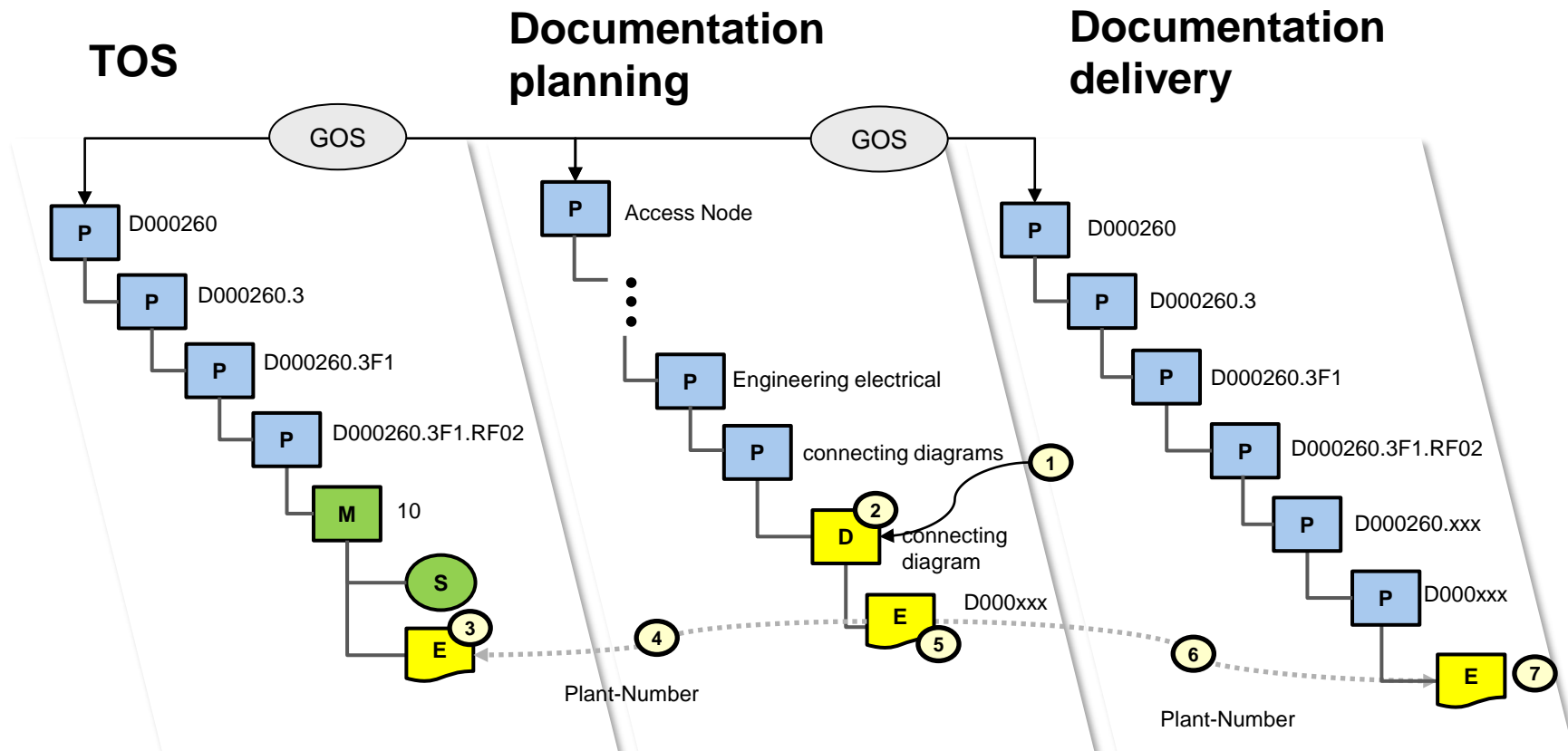
The structure for the spare parts catalog can be linked via objects to the TOS and can be generated automatically.

Spare Parts Catalog

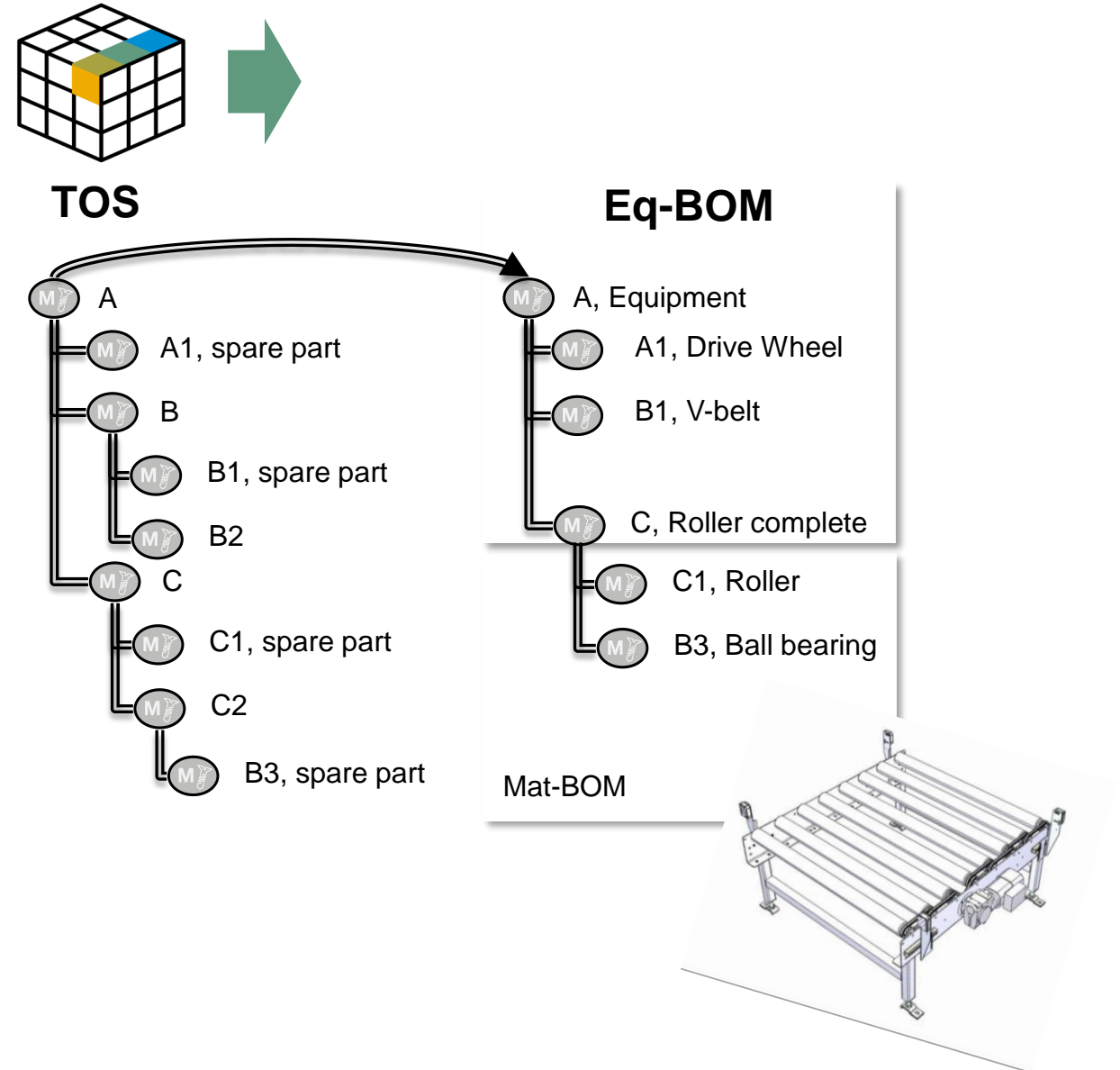
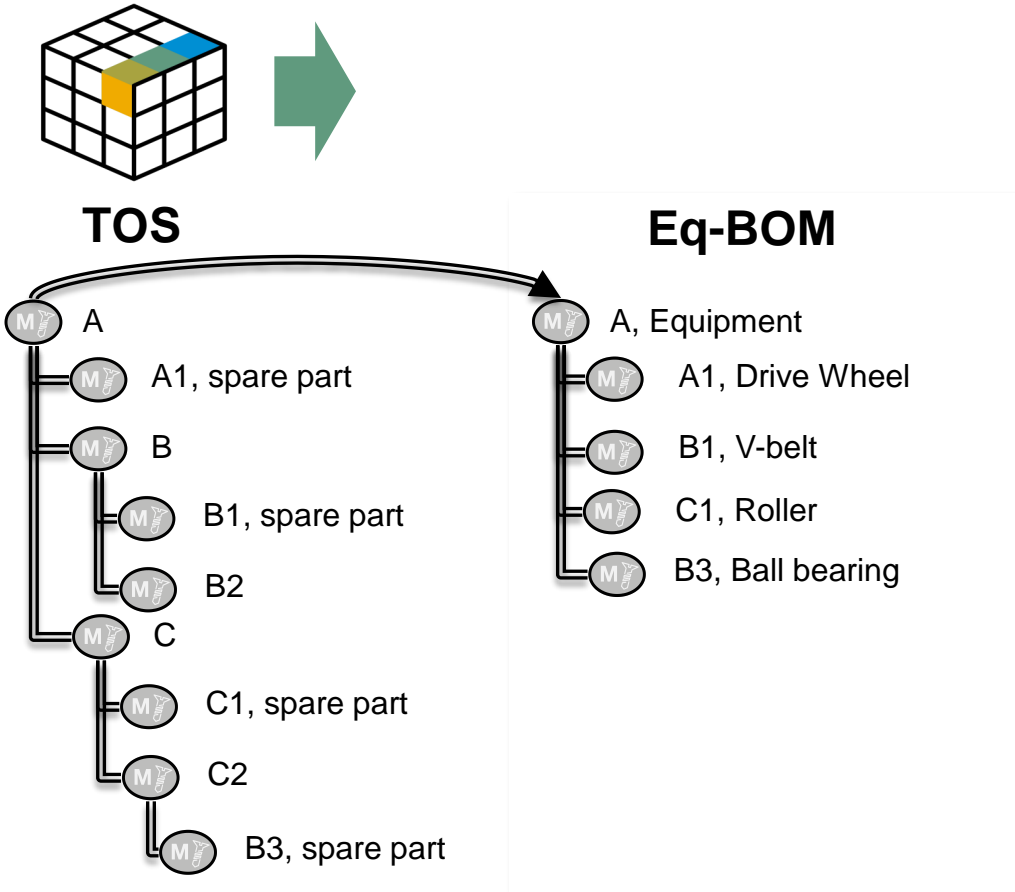


The catalog is managed typically manually and has links to the TOS.

Creation of Service Document Package



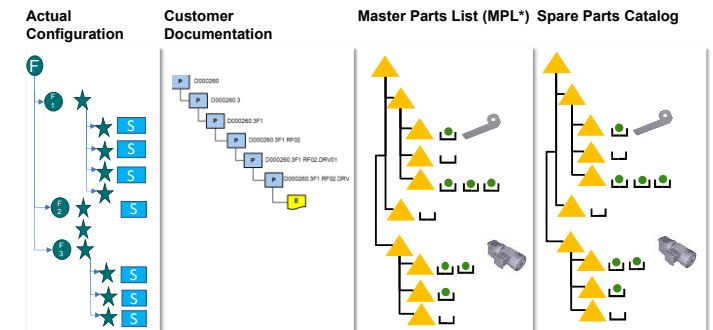
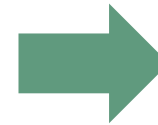
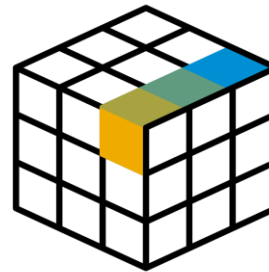
Generation of Service-BOM



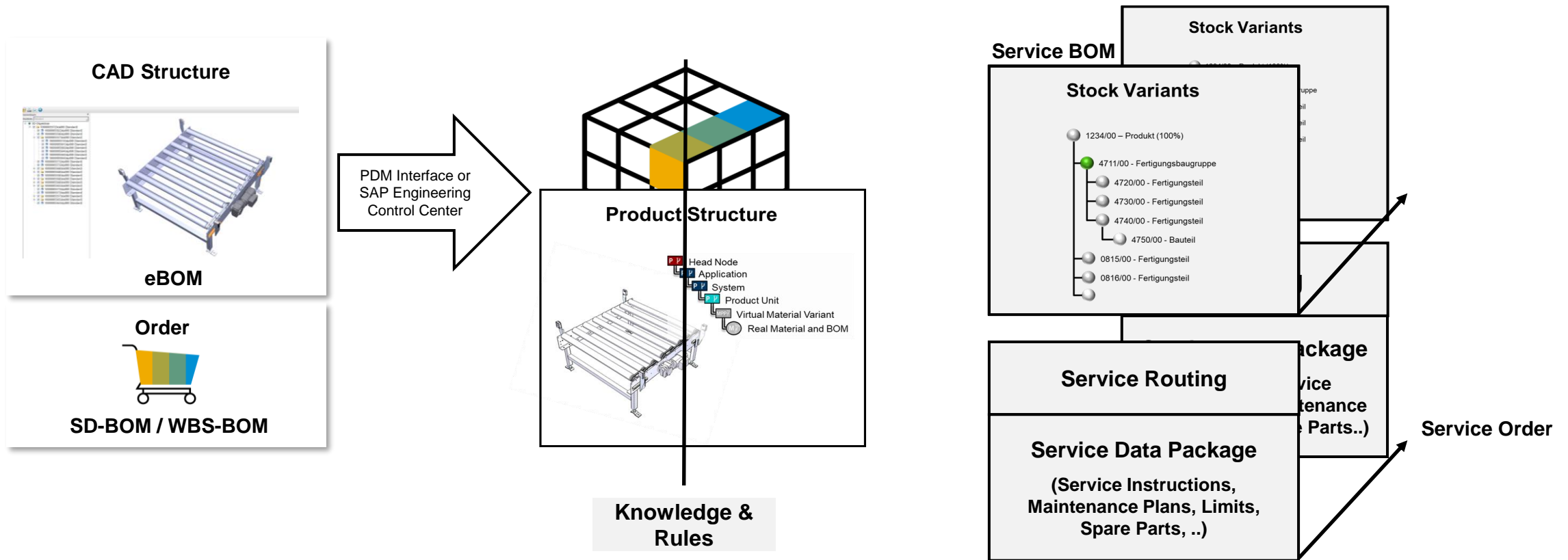
C is a spare part kit that is procured
 A1, B1, and B3 are spare parts that are listed in the equipment BOM.

Overview of Service Use Cases

- Modernization and remodeling
- Service
 - In house equipment
 - Third party equipment
 - Shutdown
- Spare Parts
 - Master Parts List
 - Obsolescence management
 - Spare parts sales
- Digital data exchange
 - Data provision
 - Data reception and conversion
- AIN integration
- Automated order execution

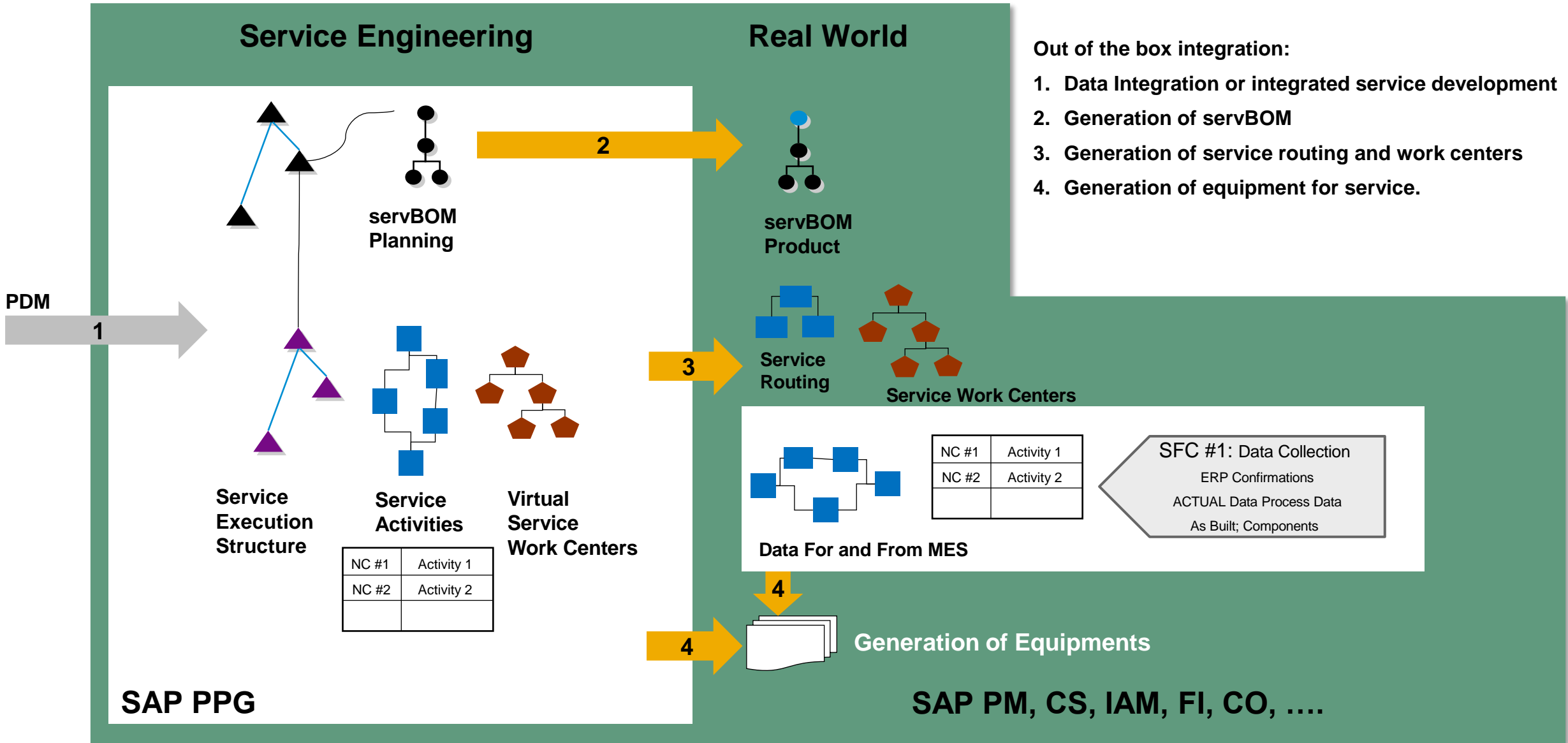


Service Data Package



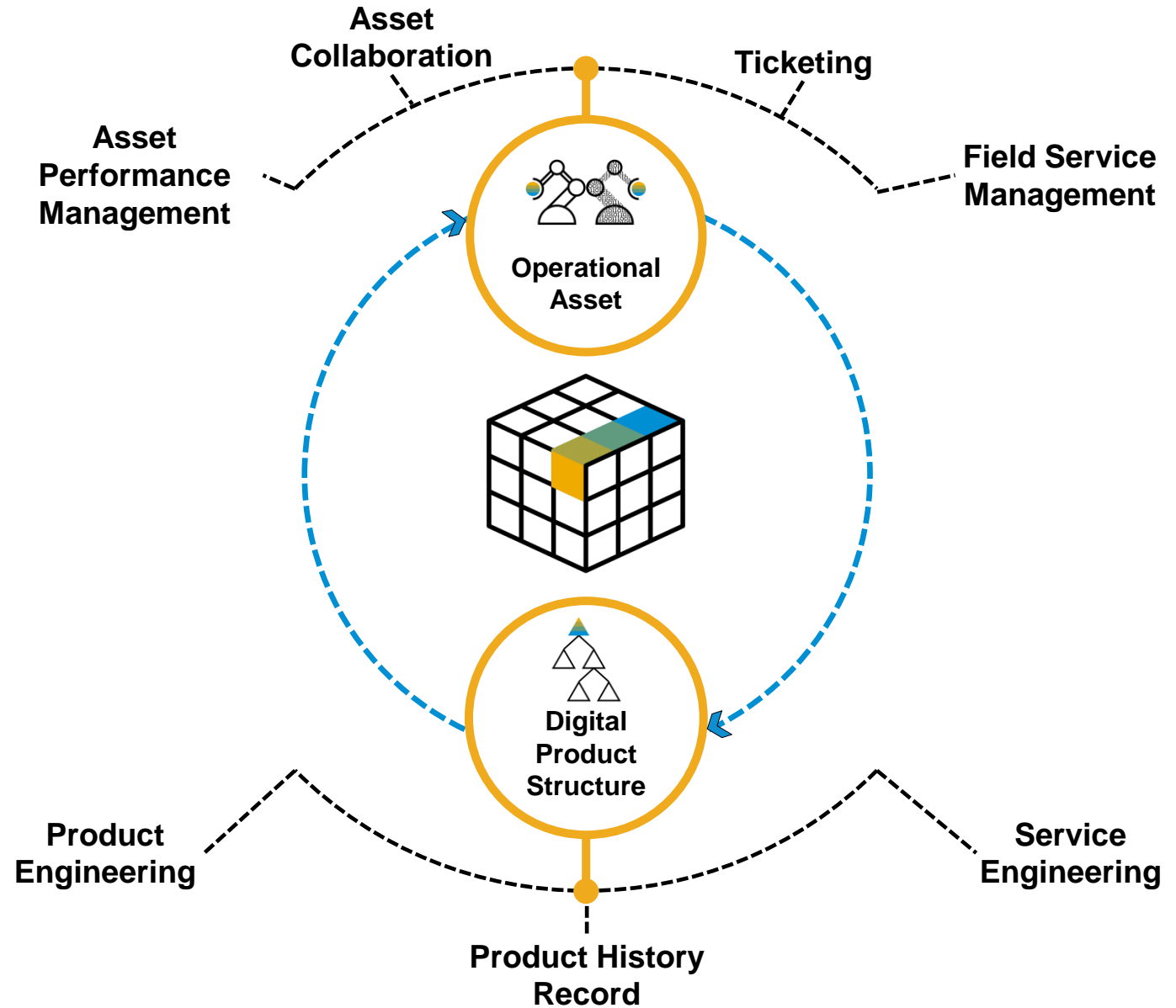
- The **Product Structure** contains different views for eBOM & service BOM.
- The **Product Structure** supports the service structures.
- In this webinar the **Product Structure** generates the **classic BOM models**, routings and other documents/settings for service.

“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

Engineer to Order (full scope)



BID PURCHASE

TECHNICAL PLAN

ENGINEER

PURCHASE PLAN

MANUFACTURE

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ORDER MANAGEMENT

Release of production orders

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Work Instruction

INLINE QUALITY MANAGEMENT

Recording of data collection in the product history record (digital twin)

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DELIVERY

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INTELLIGENT ASSET MANAGEMENT

Providing Digital Twin (as installed, as maintained) to service providers and IOT services

SERVICE MANAGEMENT

- Ticketing
- Service-Ausführung
- 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



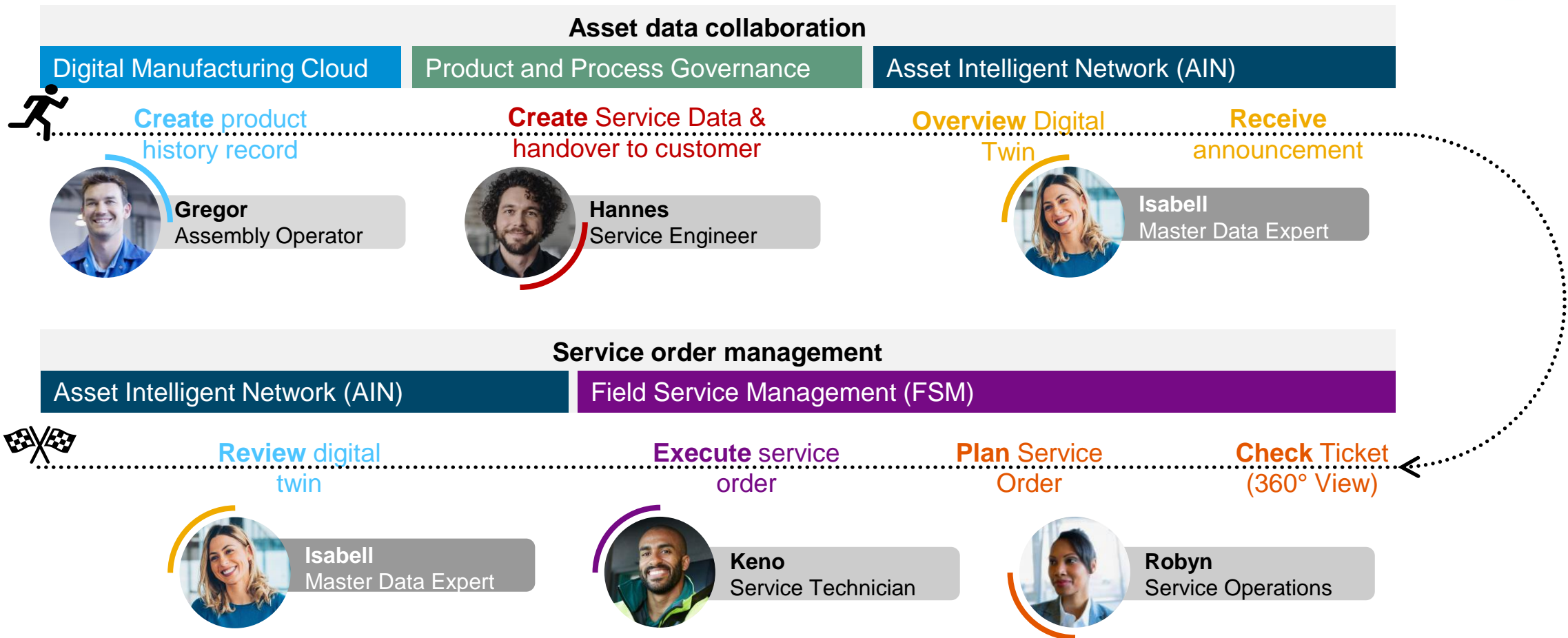
Keno
Service Technician

Green Foods Company

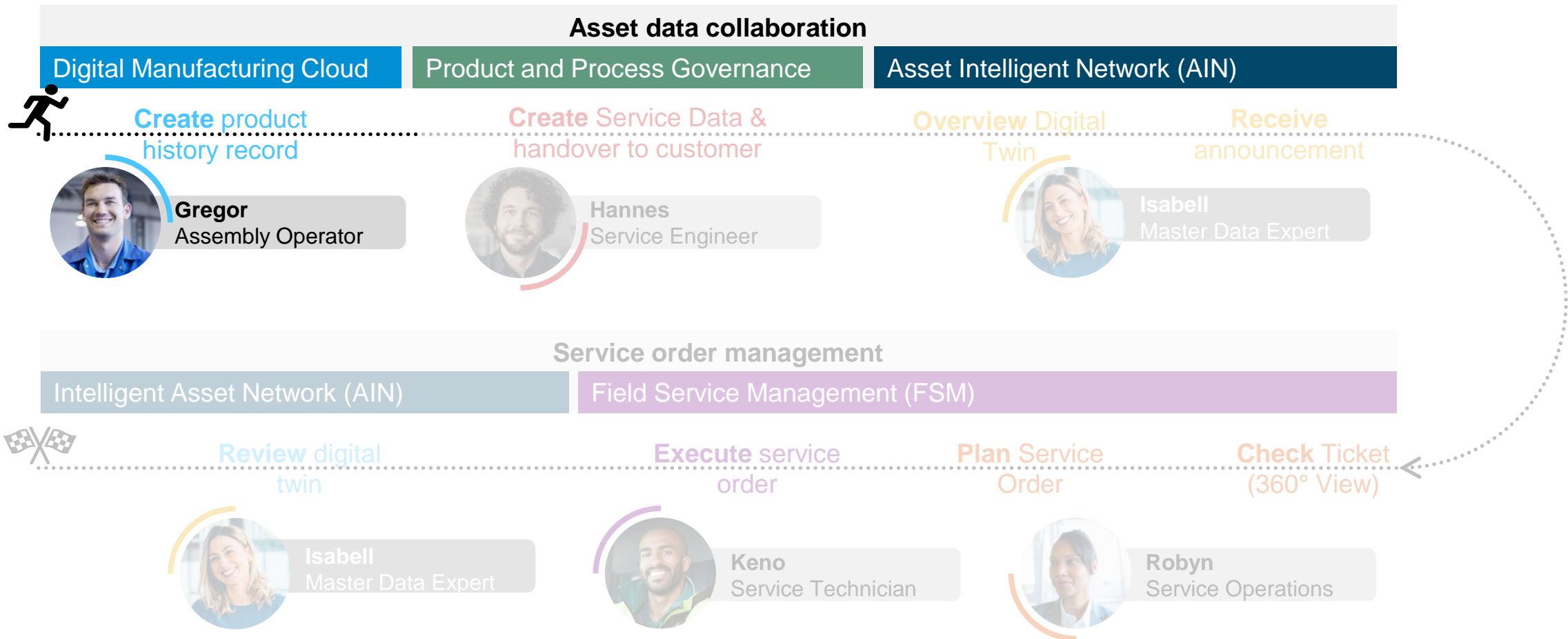


Isabell
Master Data Expert

From Manufacturing to Customer: Detailed Process Flow



From Manufacturing to Customer: Detailed Process Flow



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 SFC: 2000386. It shows production details such as 'Produced By: Syntax Systems GmbH & Co. KG', 'Planned Batch: Actual Batch', and 'Planned Quantity: 1,000 Actual Quantity: 66'. A modal window is open, showing options to share data for 'Status / Version', 'Material / Version', 'Description', 'BOM / Version', and 'Routing / Version'. Below, a 'Components (4)' table lists items like 'Assembly group bent sheet metal', 'Conveyor 3 m/s', 'Engine 380V', and 'Support'. A 'Component Details' window for '209577 / 1' shows 'General Info' (Actual Component: 209577, Version: 1, Quantity: 1,000) and 'Assembly Data' (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,

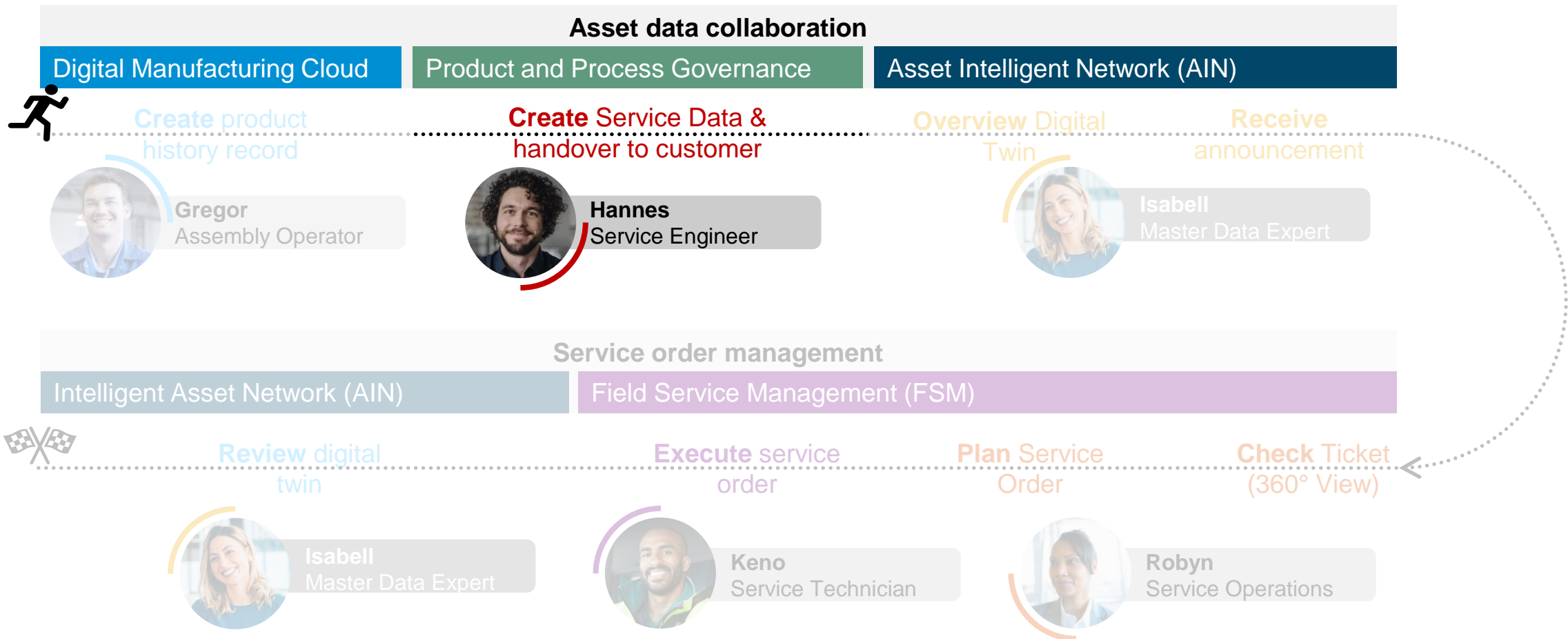


View the assembled quantities of SFCs compared to their required assembled quantities

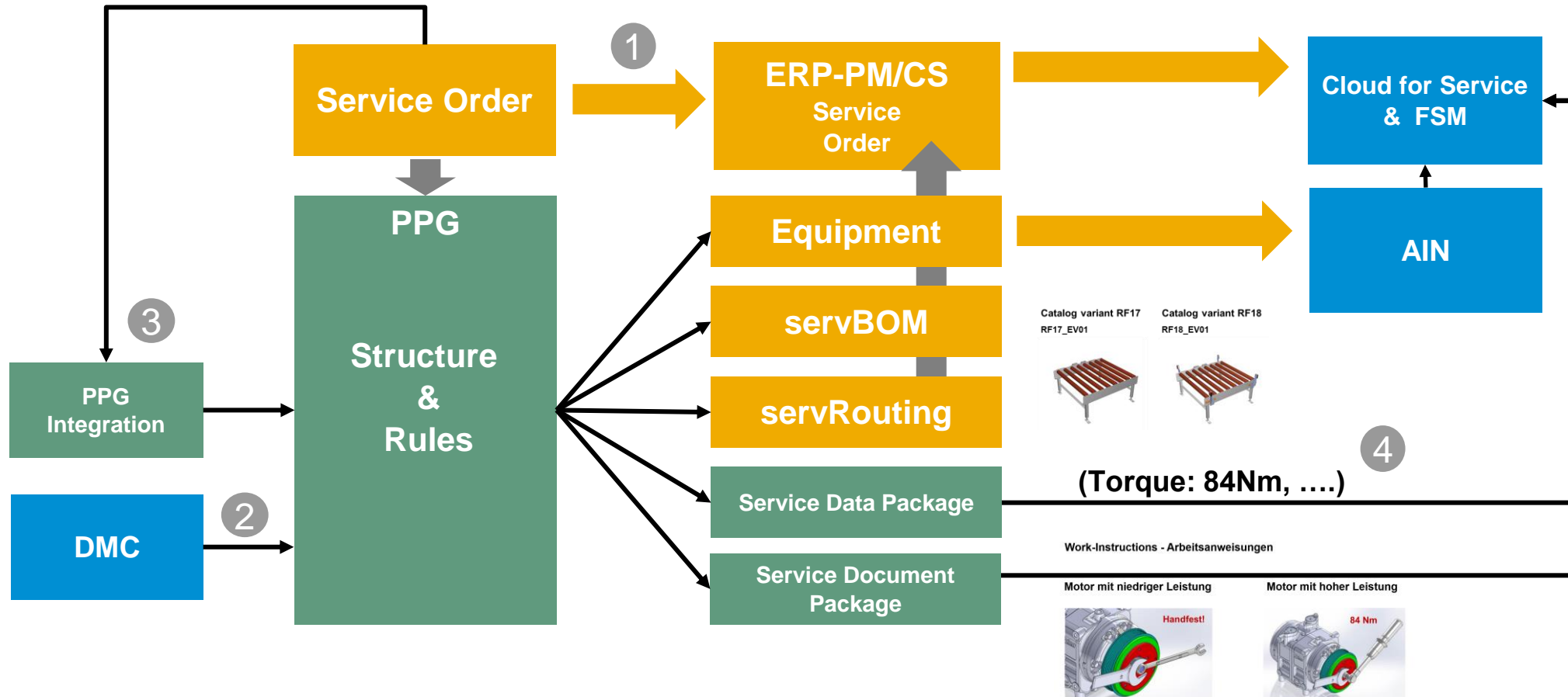


Assembly status and record of planned and unplanned components - quantity already assembled or consumed versus quantity required

From Manufacturing to Customer: Detailed Process Flow



Automated Generation and Integration of Service Data



1. The service order is based on the equipment number.
2. The equipment or serial number comes from product history record in DMC.
3. The PPG integration and data model assigns or generates the variant specific service data.
4. To provide more detailed data for each service case a service data package is generated.

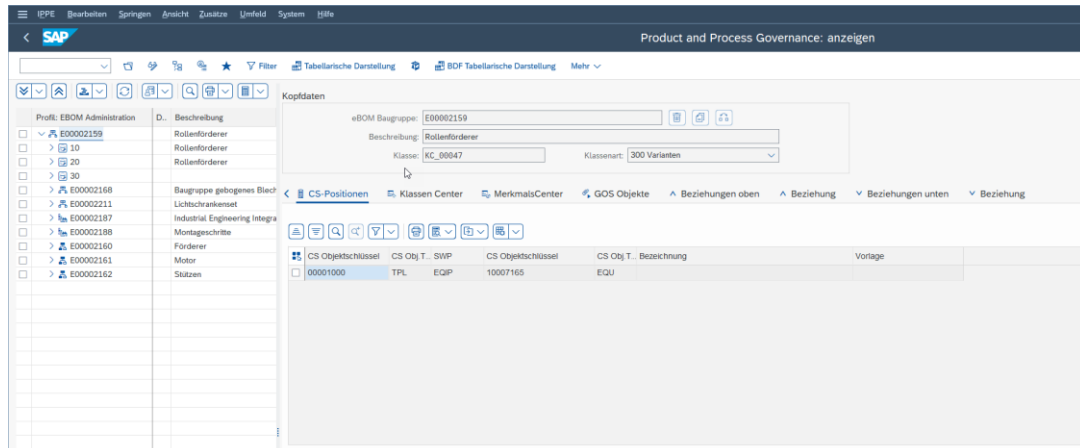
Create Service Data & handover to customer

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

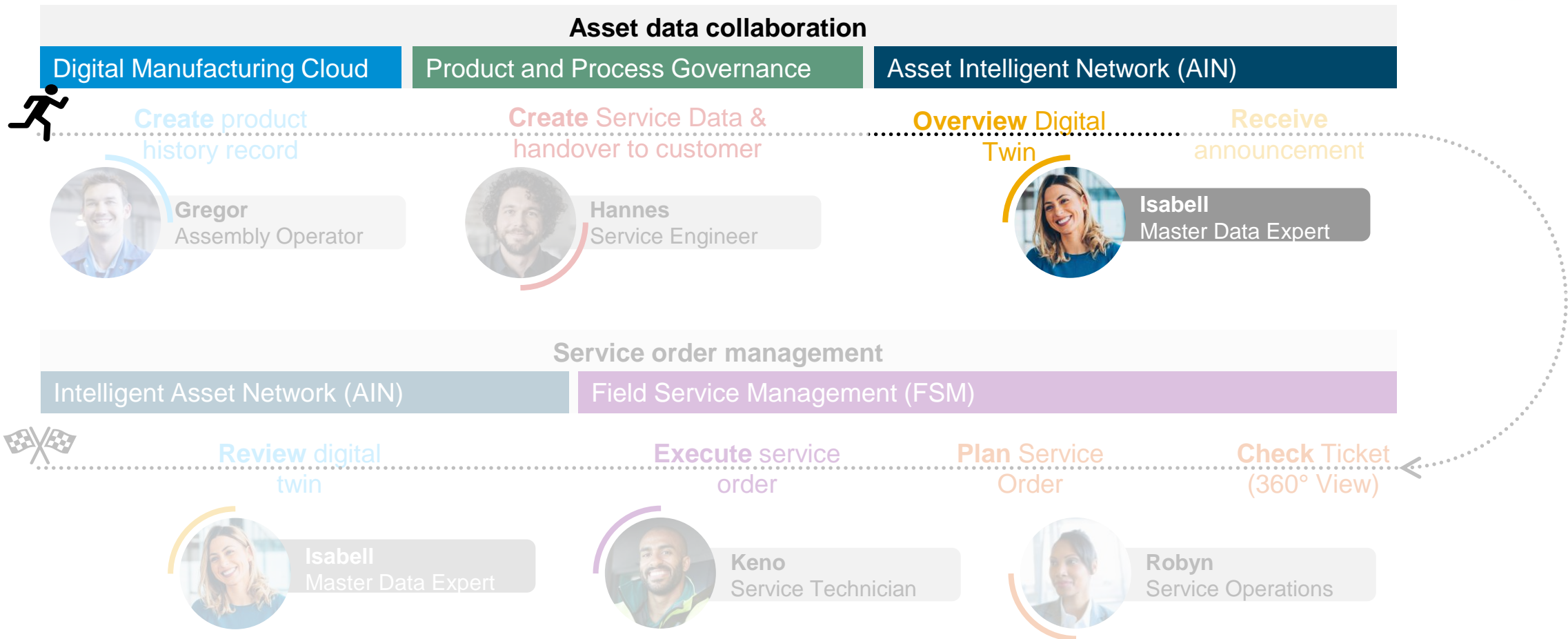


Use serialization information from various processes



Benefit from single source of truth

From Manufacturing to Customer: Detailed Process Flow



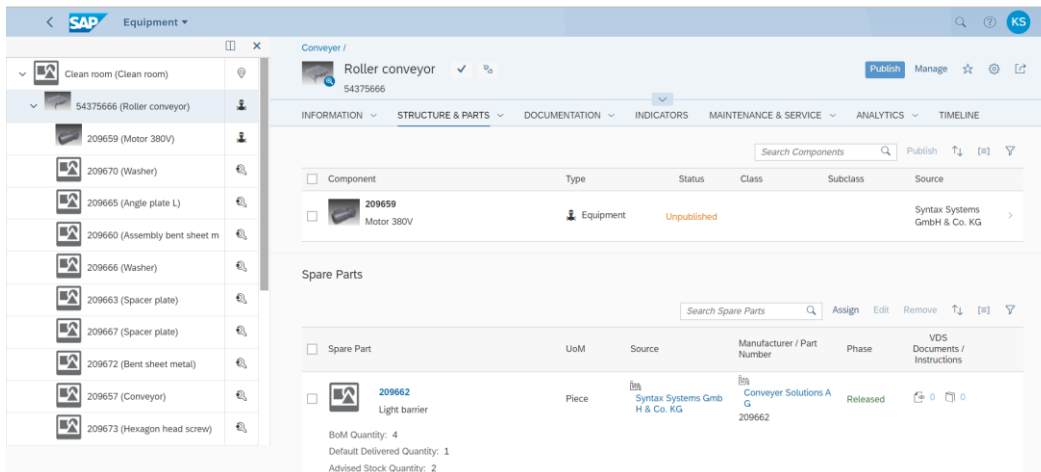
Overview Digital Twin

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

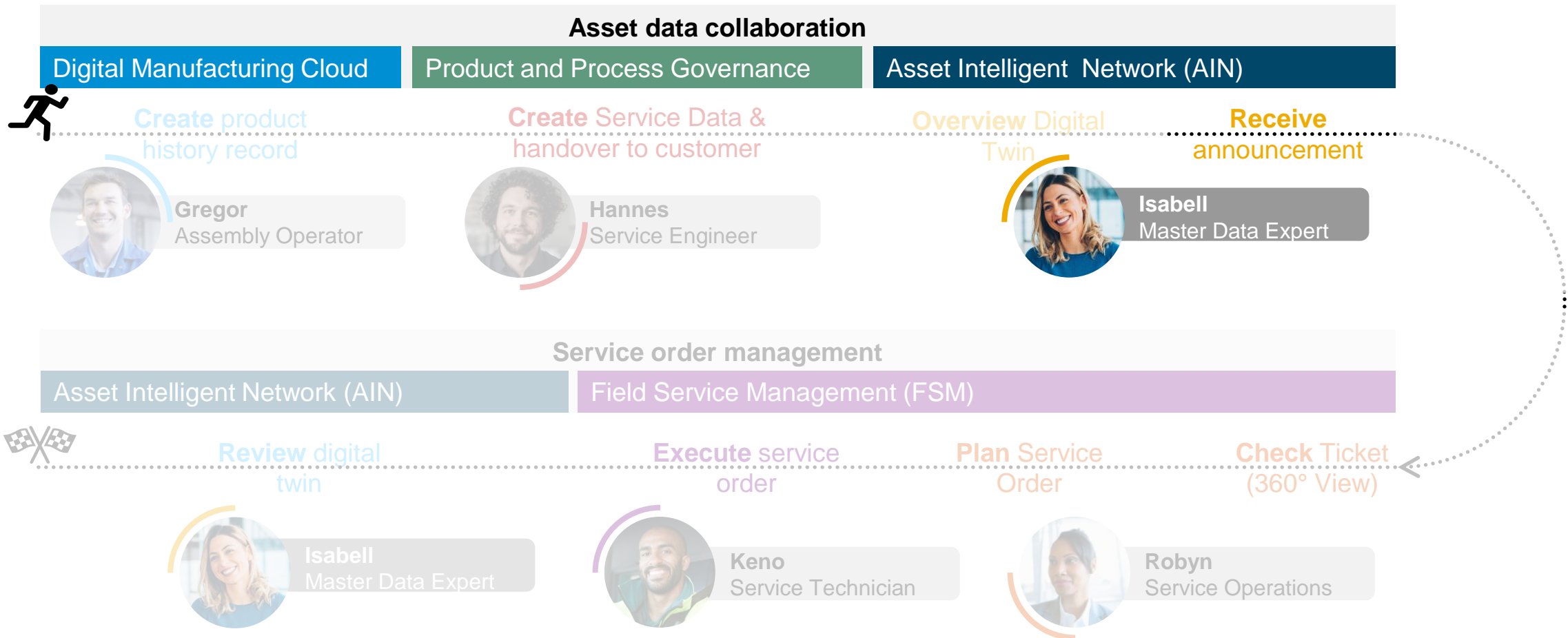


Fully integrated to SAP S/4 HANA



Single source of truth for all maintenance relevant data

From Manufacturing to Customer: Detailed Process Flow



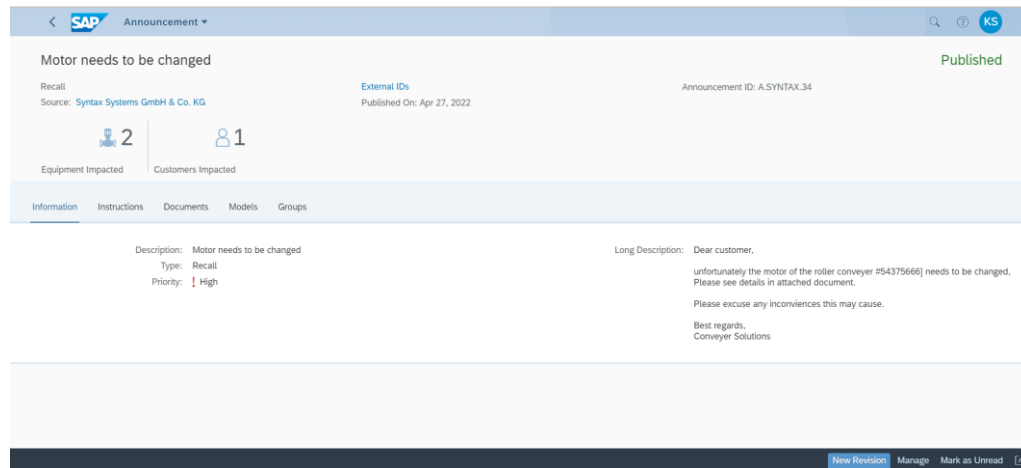
Receive announcement

Business Outcomes

“As a **customer**, I want to receive critical notes 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

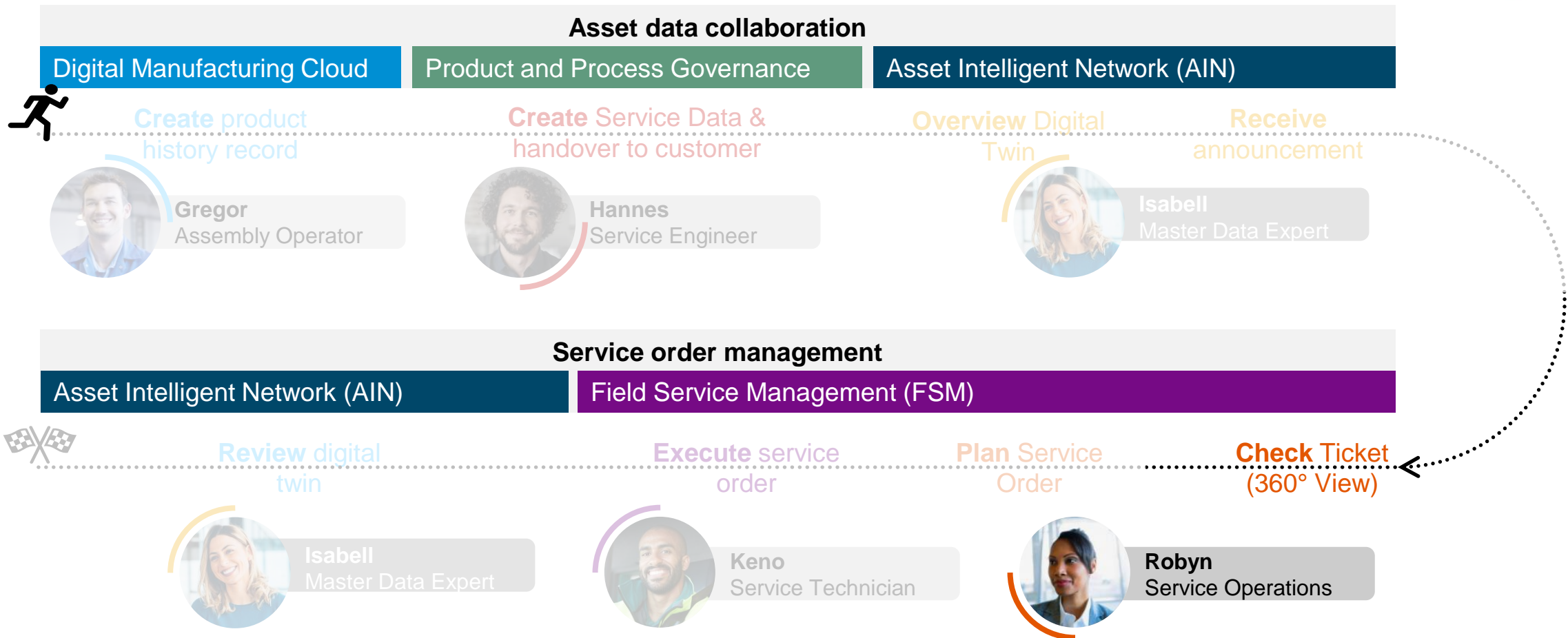


Always have access to the **most recent information directly from the manufacturer**



Receive important information always **in the context of the equipment**

From Manufacturing to Customer: Detailed Process Flow



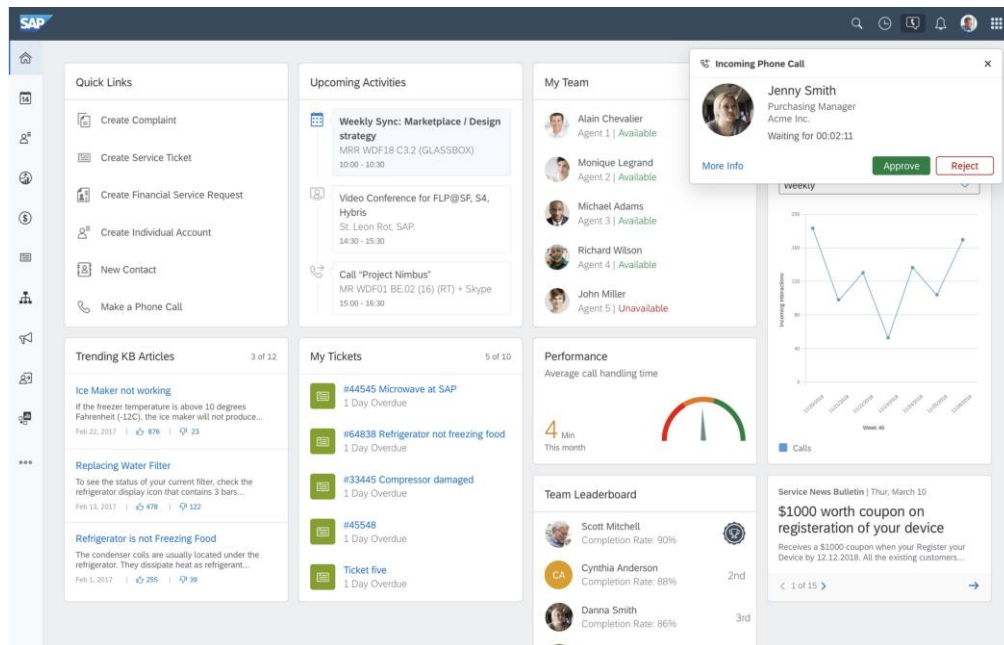
Check Ticket – 360° View

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

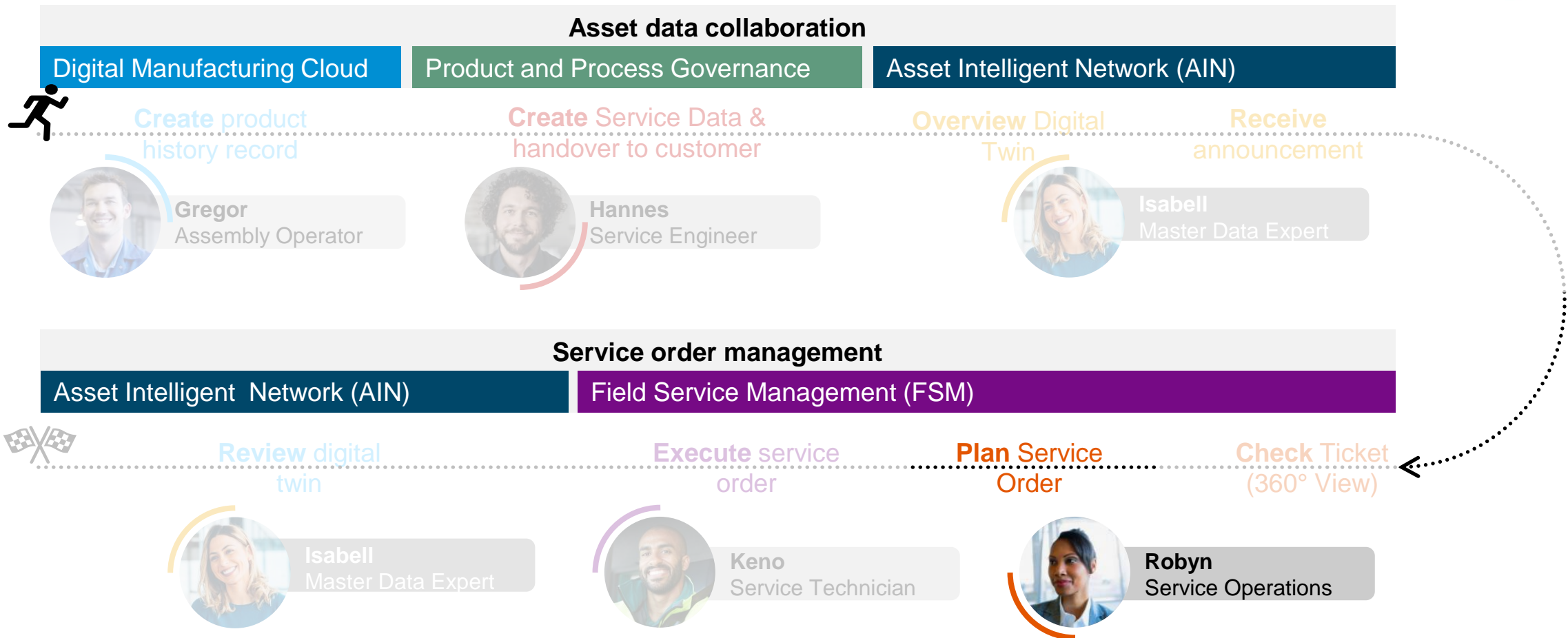


Start collaborations and establish feedback loops through contextual social collaboration with integrated feed



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

From Manufacturing to Customer: Detailed Process Flow



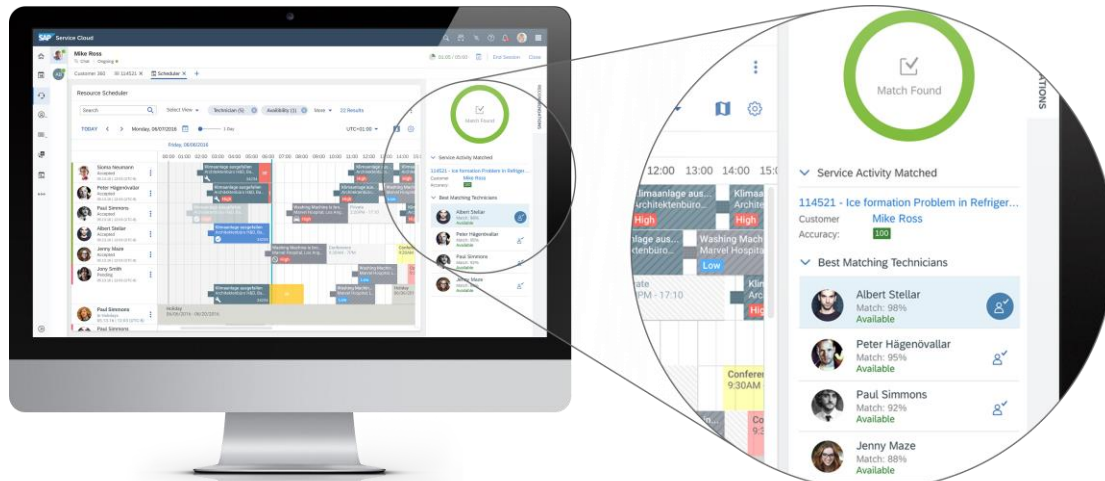
Plan service order

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

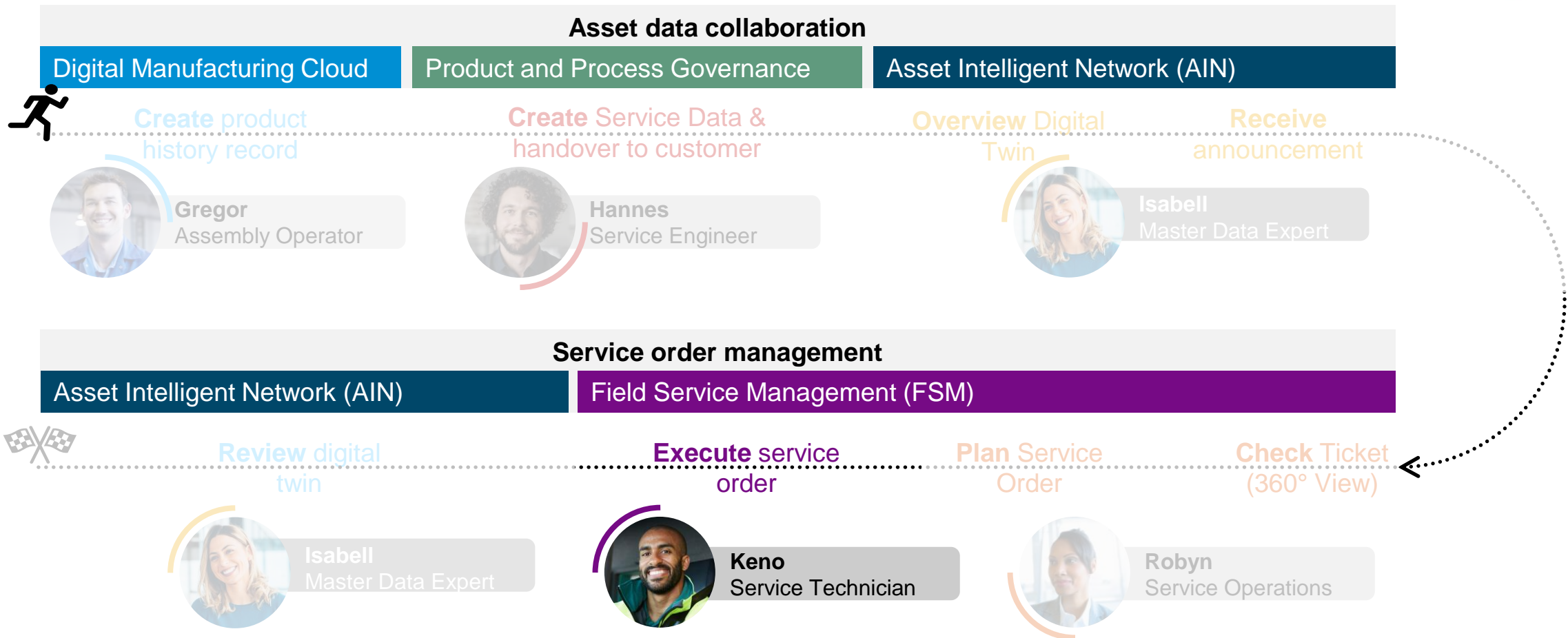


Improve productivity by optimizing routes with the map view planning



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

From Manufacturing to Customer: Detailed Process Flow



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

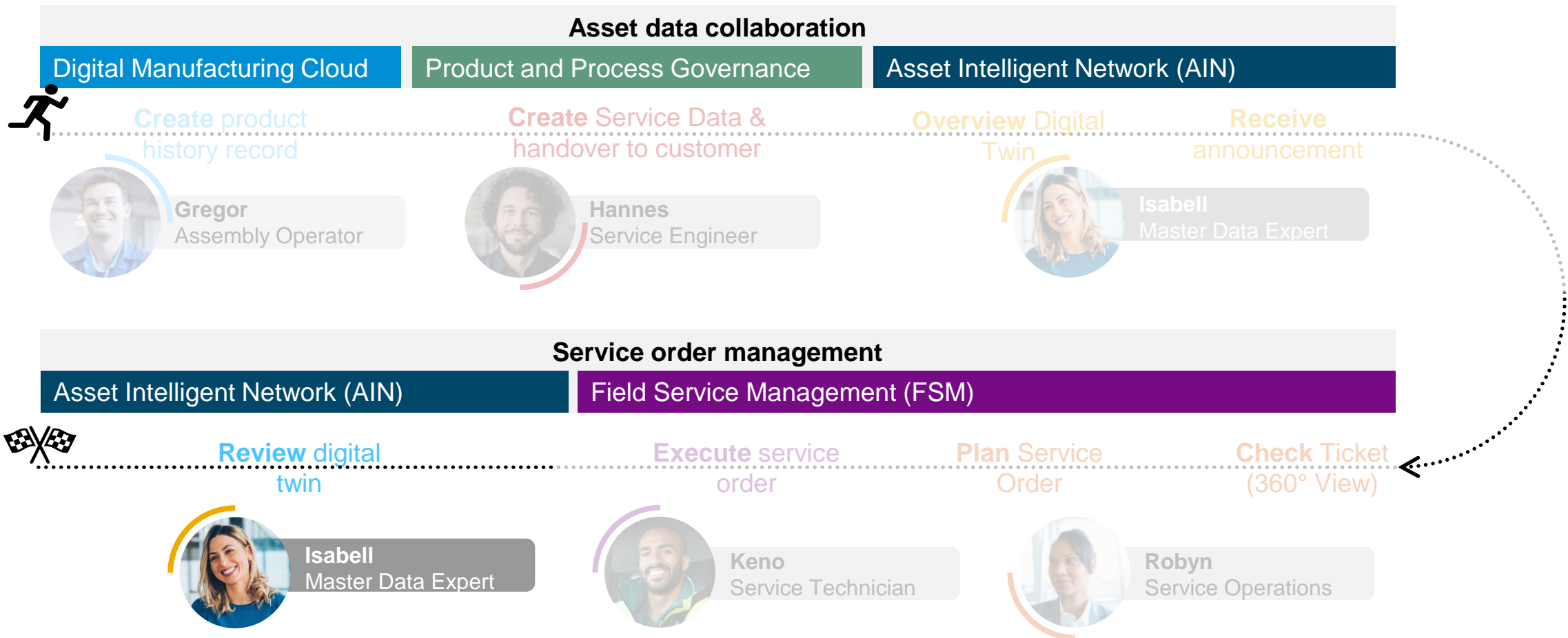


Reduce paper work and enable a smooth information flow by capturing time, material and expenses on mobile device



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

From Manufacturing to Customer: Detailed Process Flow



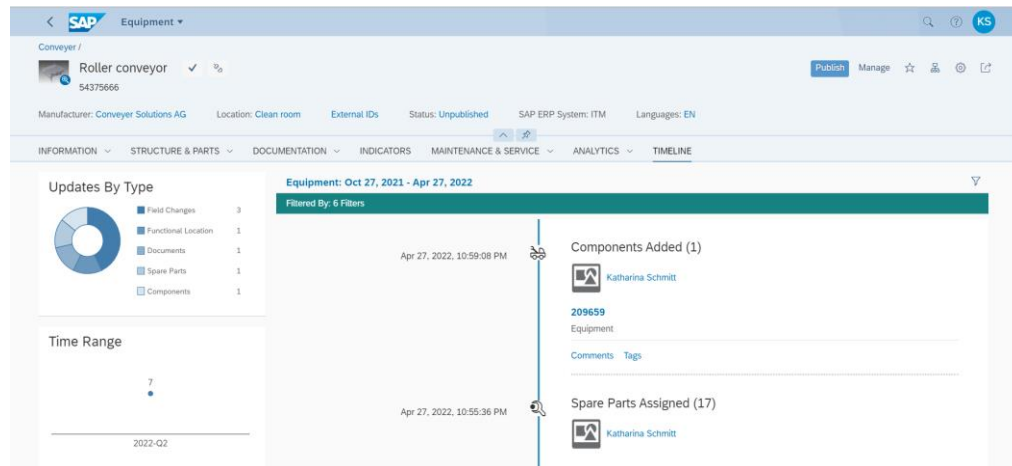
Review digital twin

Business Outcomes

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



Isabell
Master Data Expert



Process Highlights



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



Higher master data quality and complete asset information



Track of asset history over time



Digital twin as basis for **future oriented business models**

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



Design-Driven Enterprise

... für variantenreiche Produkte:

1. From Design to Sales
2. From Configuration to Manufacturing
3. From Manufacturing to Customer for Configurable Components and End-products

... für das Projektgeschäft:

1. From Bid to Design & Procurement
2. From Project Start to Manufacturing & Procurement
3. From Manufacturing to Customer

Get ready to automate your business!



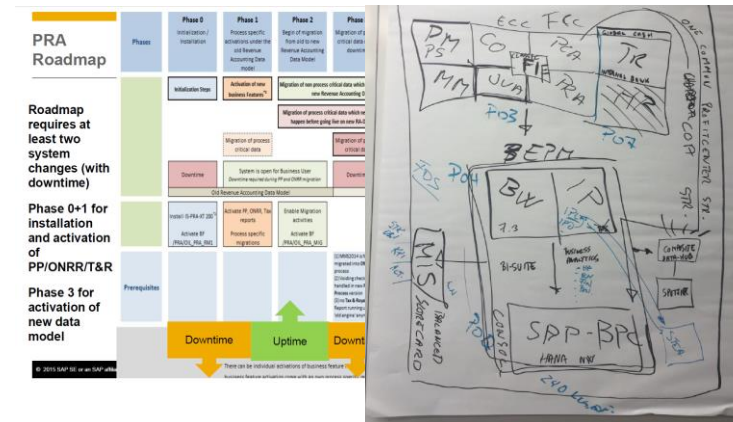
Business Scenario Analysis



Detailed Business Scenario Recommendations



Test Drive „Model once configure anywhere!“



Transformation Path and Target Architecture

Thank you & see you soon.

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