

Web-Seminarserie

INDUSTRY4.NOW

für die Fertigungsindustrie



**Das intelligente Manufacturing Execution System für den
Anlagen- und Sondermaschinenbau**

Webseminar-Serie Sondermaschinen- und Anlagenbau



**Model Once – Configure Anywhere:
Wie Modellbasiertes Systems
Engineering Prozesse in Sales, Service &
Logistik vereinfacht**

03.09.2021 10:00 - 11:15 Uhr



**Guided Selling mit der SAP MOCA
Methodologie für den Maschinenbau
im CTO und CTO+**

10.09.2021 10:00 - 11:15 Uhr



**Die Zukunft des Servicegeschäfts im
Maschinenbau: Guided Selling, Design
and Maintenance for Serviceability**

17.09.2021 10:00 - 11:15 Uhr



**Hochprofitabel und kundenspezifisch
produzieren - Integration aller Change
Prozesse im Maschinenbau**

24.09.2021 10:00 - 11:15 Uhr



**Das intelligente Manufacturing
Execution System für den Anlagen- und
Sondermaschinenbau**

01.10.2021 10:00 - 11:15 Uhr

End-to-End Scenario

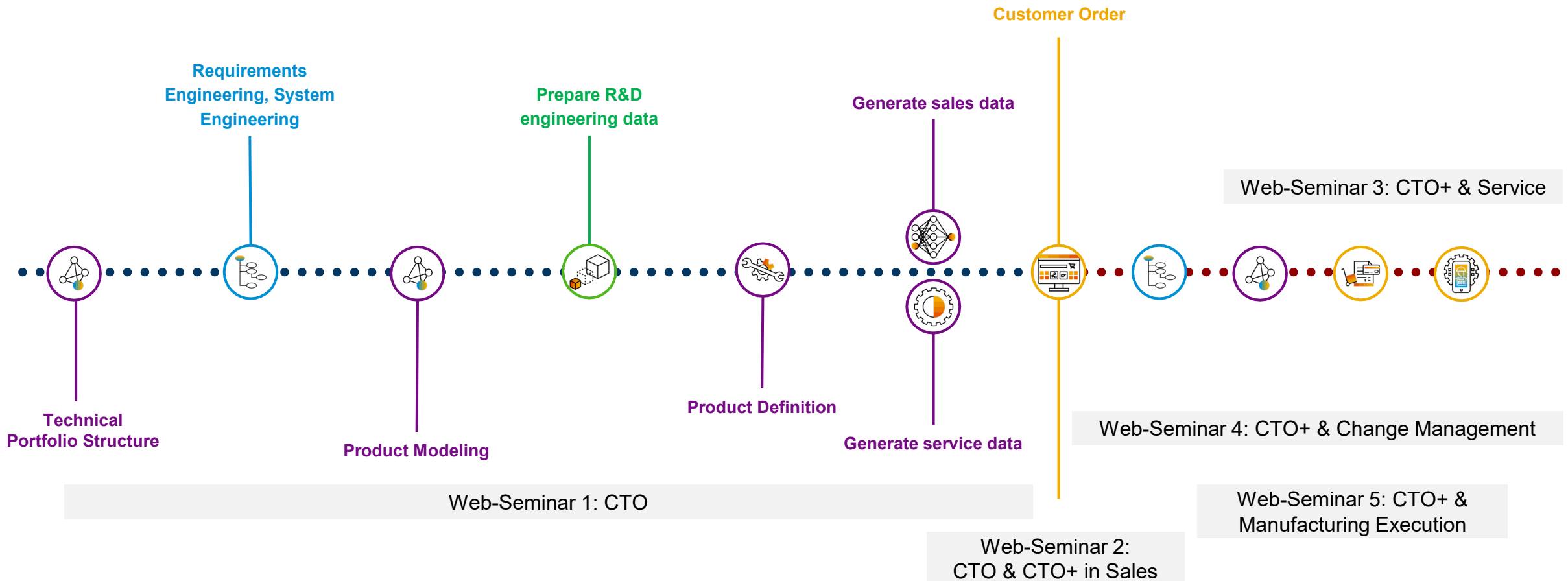


The „Blue“ Process

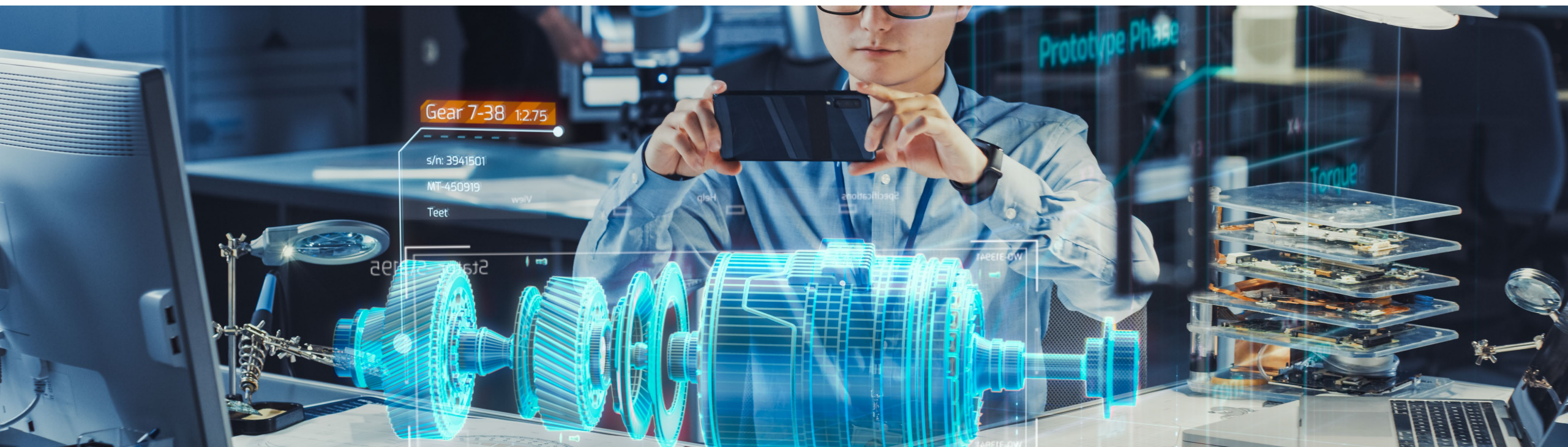
Order Neutral Product Development & Design

The „Red“ Process

Order Engineering and Order Management



Recap

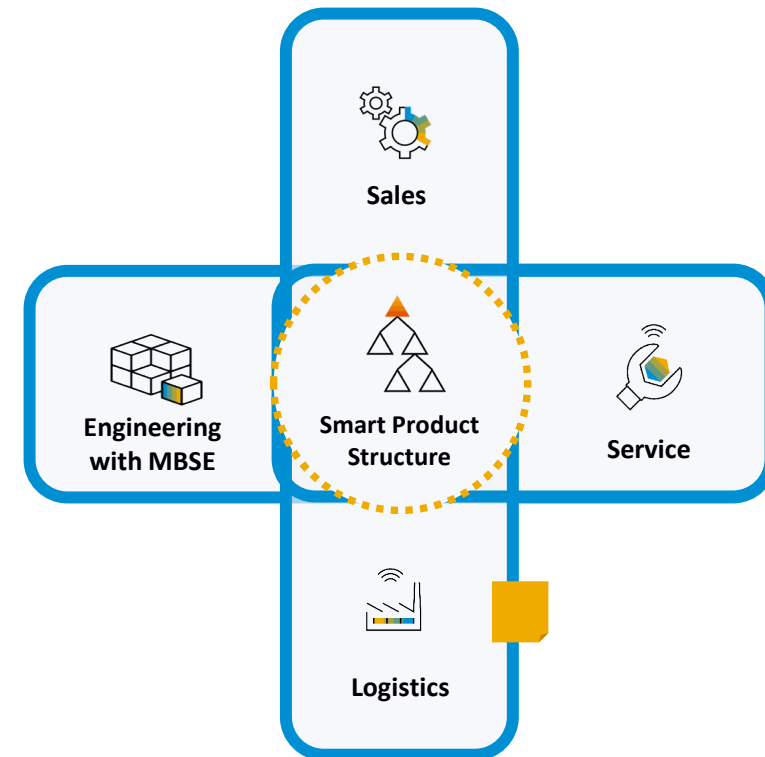


Change affecting execution directly:

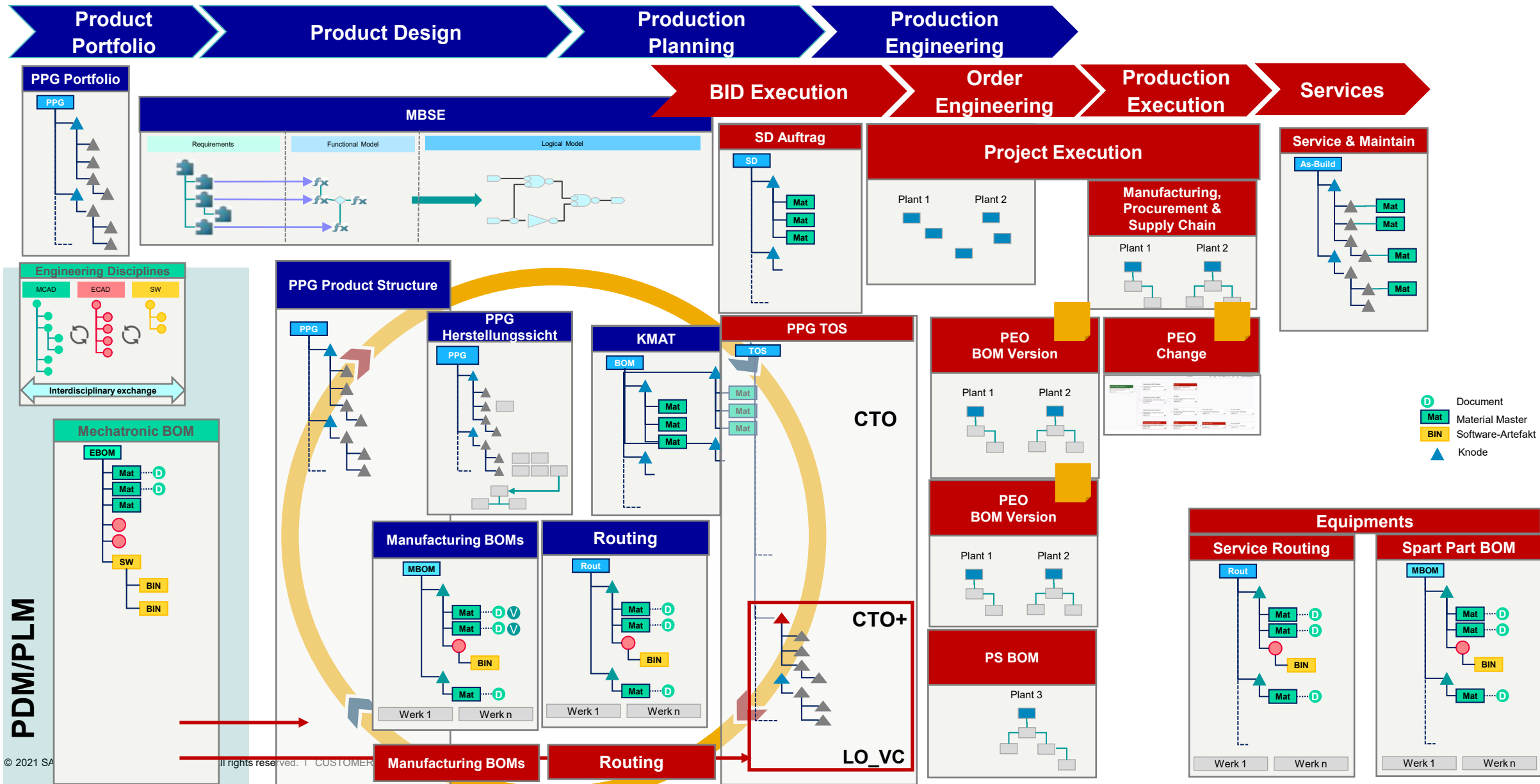
- Harmonization of customer driven processes across the enterprise (TOS)

Change affecting execution indirectly:

- Centralized product configuration and knowledge management



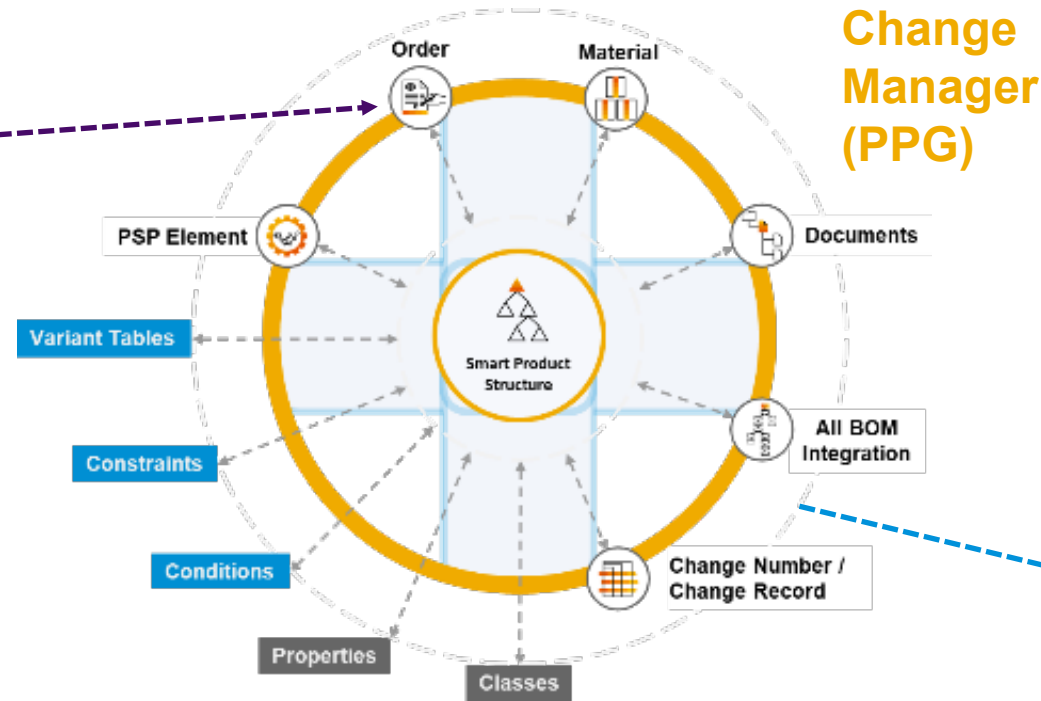
The agile Digital Thread



How to execute changes with **high agility** in IM&C

Change Request

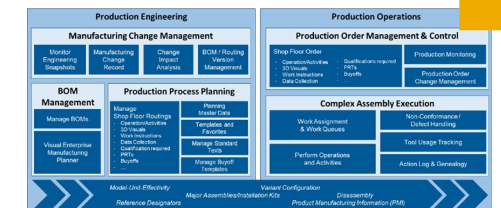
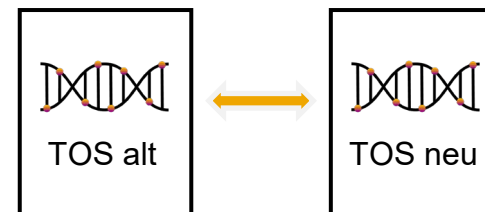
- Change CTO
- Change CTO+
- Change ETO
- Change Production
- ...



Change Manager (PPG)

Execution of Change Request (PEO)

Change Data Model



Terminology



PPG (previously PCC)

Production Process and Governance

S/4HANA PEO

Production Engineering and Operations

MBSE

Model Based Systems Engineering

TOS

Technical Order Structure

End-to-End Scenario 1: Initial Start with Customer Order (CTO)



The „Blue“ Process

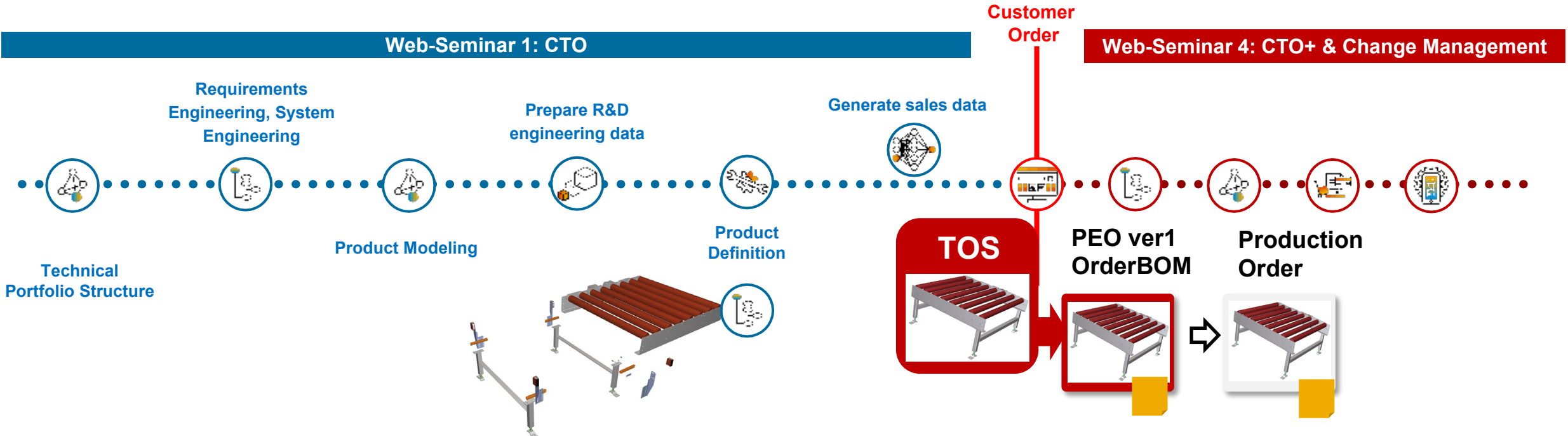
Order Neutral Product Development & Design

The „Red“ Process

Order Engineering and Order Management

Web-Seminar 1: CTO

Web-Seminar 4: CTO+ & Change Management



End-to-End Scenario 2: New Customer Requirement (CTO+)

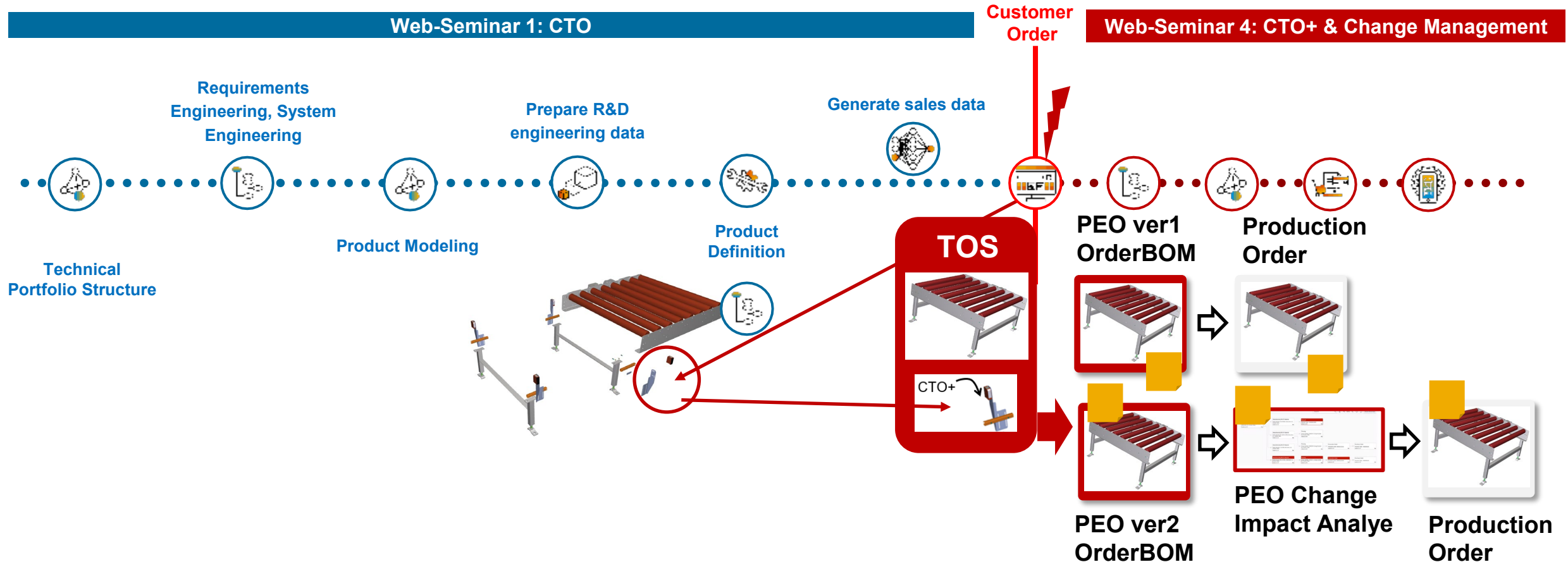


The „Blue“ Process

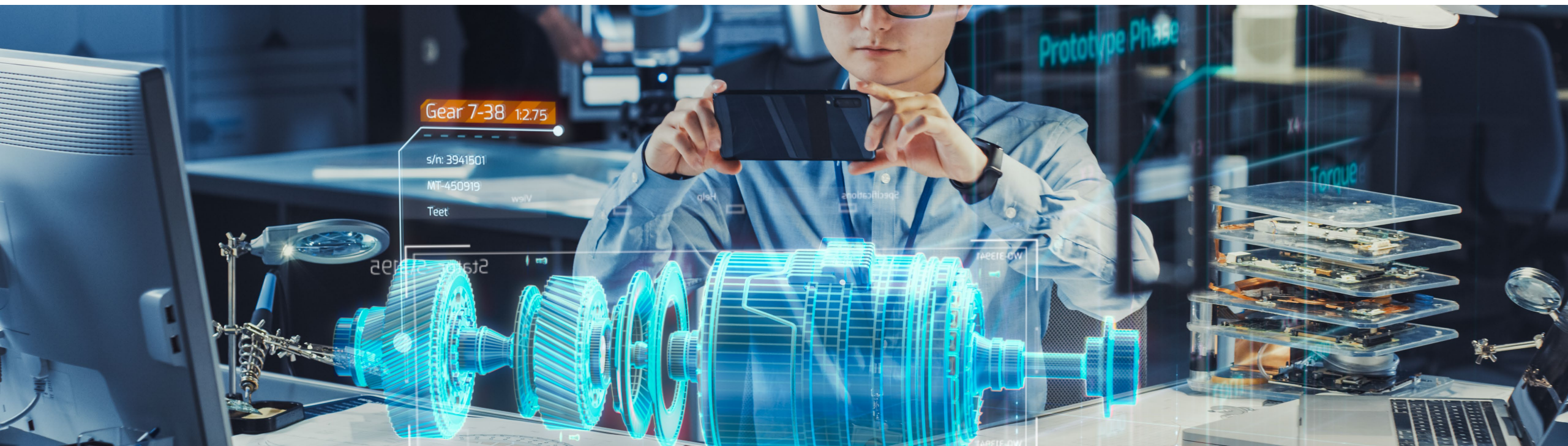
Order Neutral Product Development & Design

The „Red“ Process

Order Engineering and Order Management



S/4HANA PEO Deep Dive

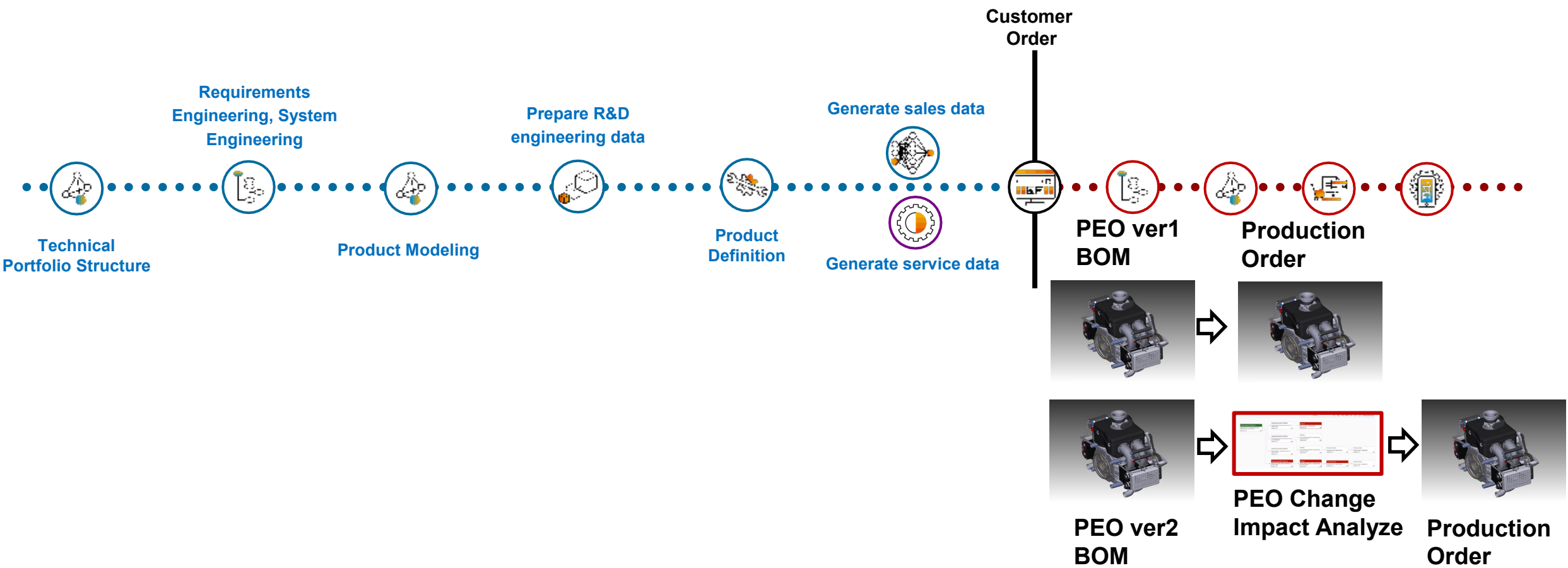


The „Blue“ Process

Order Neutral Product Development & Design

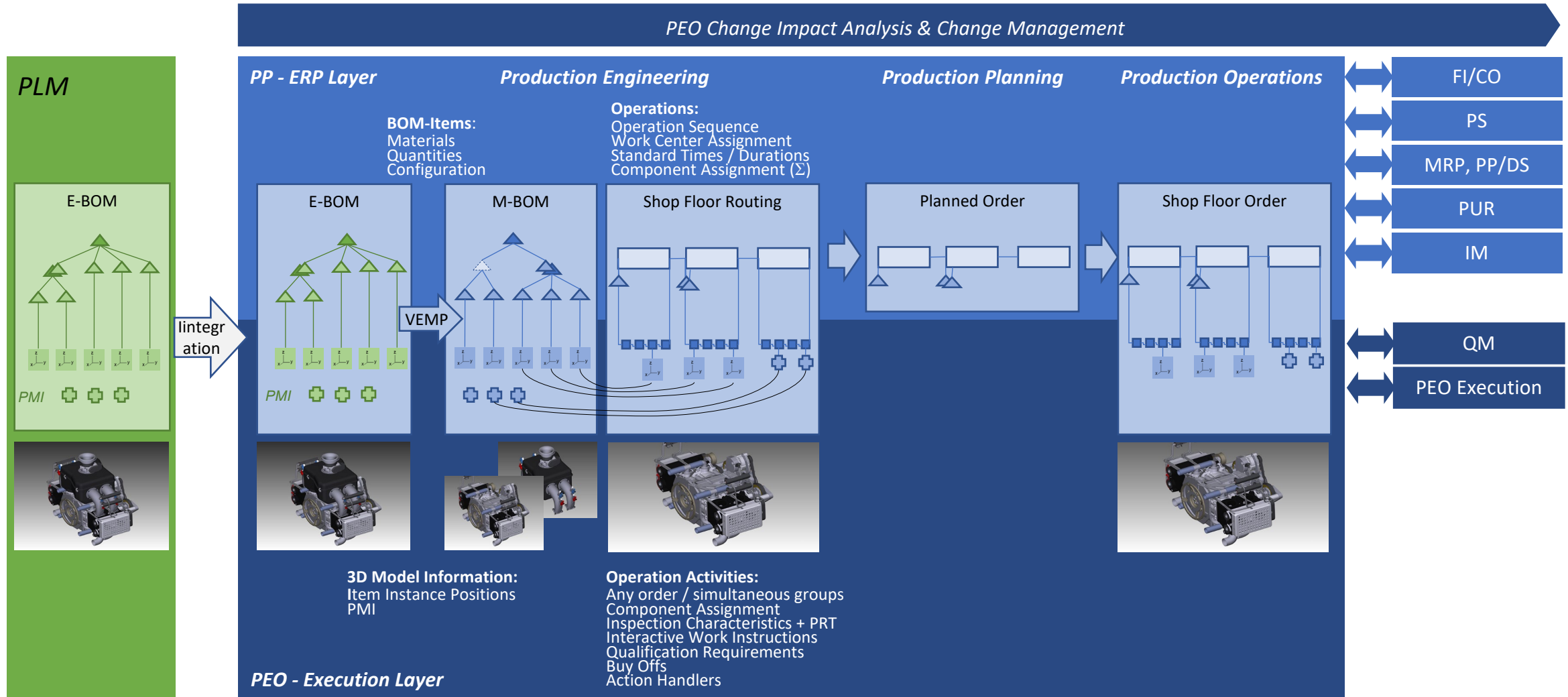
The „Red“ Process

Order Engineering and Order Management



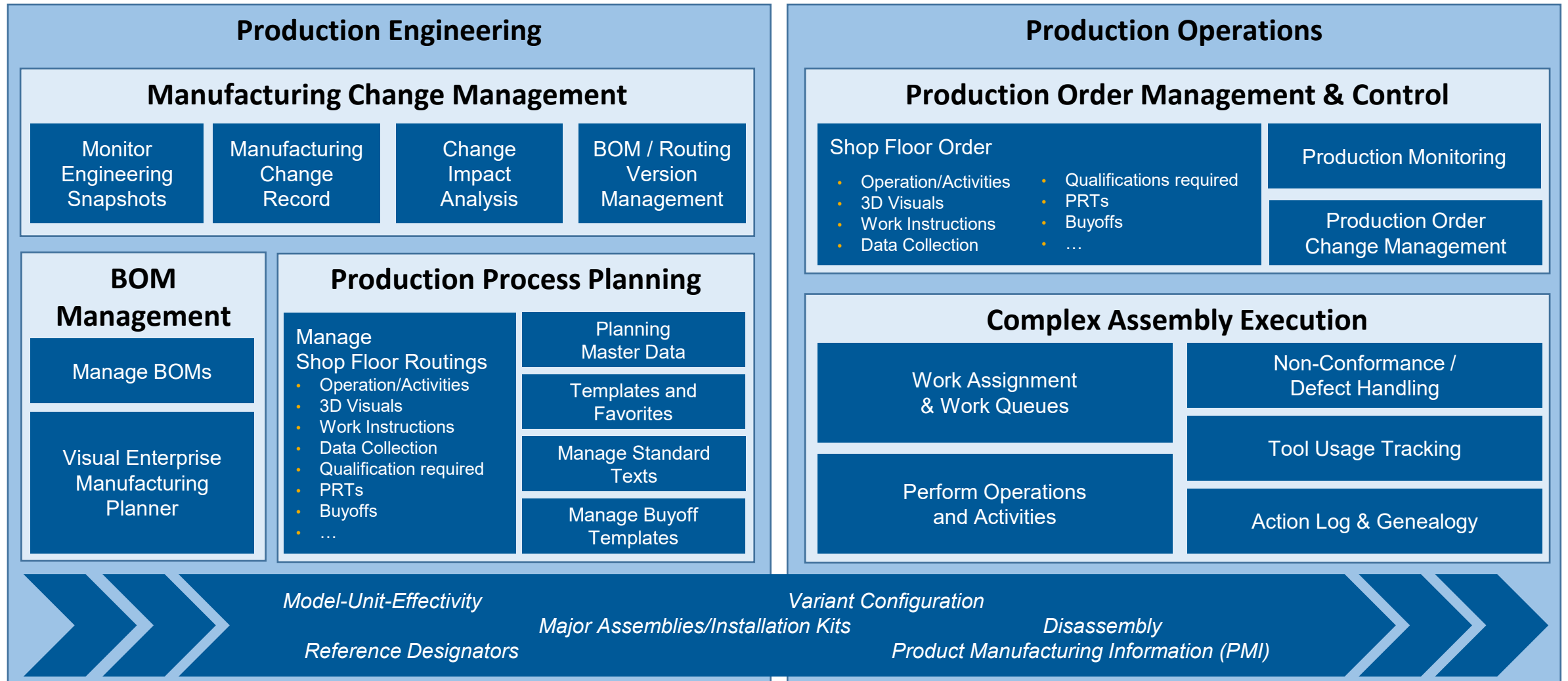
Production Engineering and Operations

Combining PP-ERP and new Execution Layer in S/4HANA



SAP S/4HANA Manufacturing for Production Engineering and Operations

Apps and Capabilities

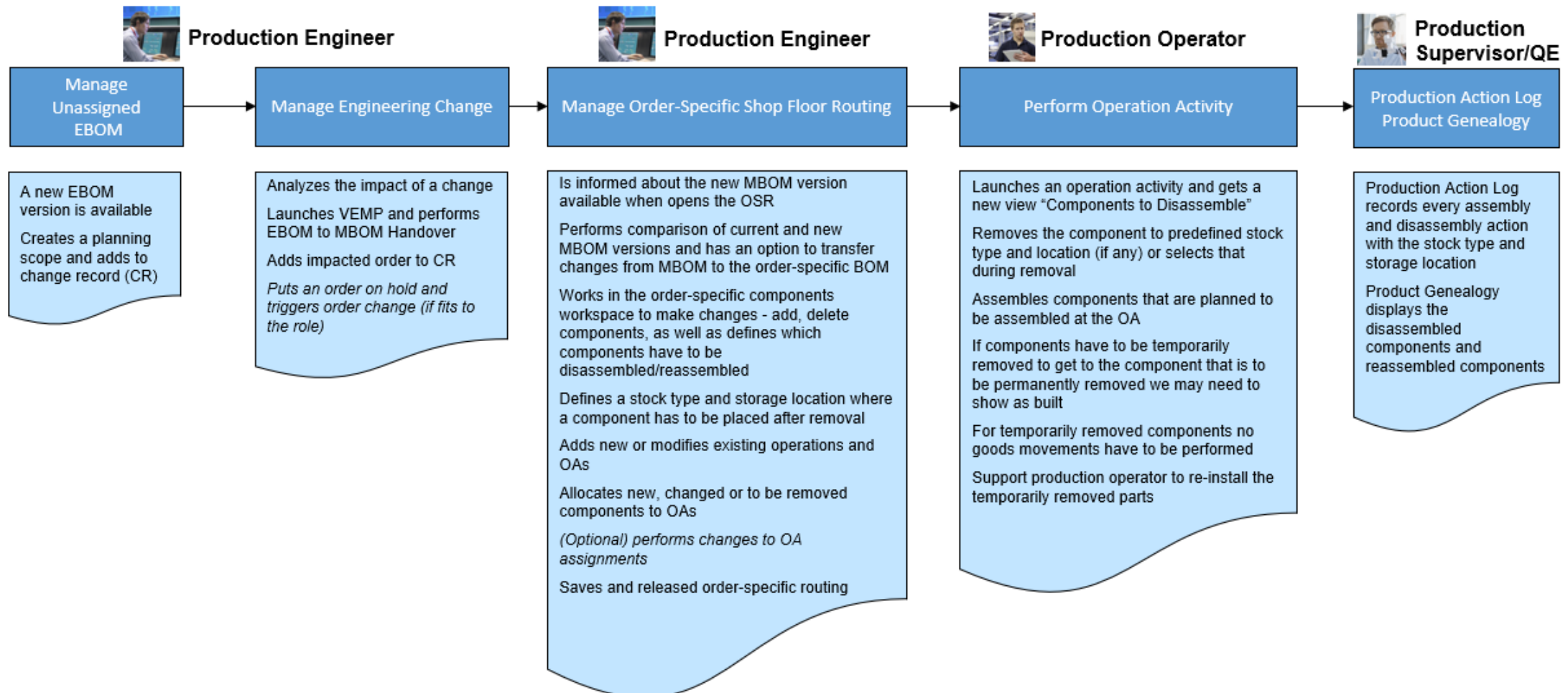


Disassembly

Disassembly due to Engineering Change



Engineering changes may affect an order at any time during production execution. The impacted order may include parts that have been already installed at operations and operation activities that have been already completed or partially processed. S/4HANA PEO 2020 FPS0 release allows the production engineer to incorporate late engineering changes that require temporary or permanent disassembly of components with or without predefined stock type and storage location for return.



Disassembly

Disassembly due to Engineering Change



An order change for the in-process order can be triggered from the Manage Production Orders app using the Change Order button. As in the previous PEO release, the system will create an order-specific routing and puts all or selected operations on hold.

In the PEO 2020 FPS0 release is it now possible to run comparison between a new version of the MBOM and the current order BOM while planning the change to the in-process order in the order-specific routing.

The changes may include:

- A component exists in the new MBOM and is not available in the order BOM
- A component exists in the order BOM and is not available in the new MBOM
- Component quantity in the new MBOM is either increased or decreased

After getting an overview of all changes which are highlighted in the comparison screen, the user is able to either transfer them individually or use the Transfer All button to automatically transfer all changes to components from the new version of MBOM into the current order BOM.

Having done changes to the components, it is still possible to perform further changes to operation activities or the structure of the order-specific routing:

- Add/delete operations and operation activities (they shall not be started though!)
- Change assignments to a not started operation activities such as qualifications, work instructions, buyoffs, PRTs, action type handlers, inspection characteristics, etc.

The screenshot displays the SAP Component List Workspace for Order 1868706. It shows a comparison between the current order BOM (Version 0001) and a new MBOM (Version 0002). The 'Transfer All' button is highlighted in the comparison screen. Below, a detailed table lists the components and their changes.

Component	A/B	Reference Desig...	Status	Item Cat.	Item	Plant	Stor.Loctrn	Quantity	Unit	Type of Change	State
2117-802-ECO-09876-RUBBER_RNG	A		□	L	0030			1	EA		Not Editable
2117-802-ECO-668901-THROTL_BDY	=		□	L	0040			1	EA		Editable
2117-802-ECO-G1310-GSKT_FLG_RNG	=		□	L	0050			1	EA		Not Editable
2117-802-ECO-777465-FLG_HD_M6X4	=		□	L	0060			4	EA		Editable
2117-802-ECO-200-AIRBOX_UPR	=		□	L	0070			1	EA		Editable
2117-802-ECO-100-AIRBOX_LWR	=		□	L	0080			1	EA		Editable
2117-802-ECO-8791-EXHST_HDR	A		□	L	0090			4	EA		Not Editable
2117-802-ECO-777435-FLG_HD_M6X1	≠		□	L	0100			16	EA		Not Editable
2117-802-ECO-G1400-GSKT_INTK_AIR	=		□	L	0110			4	EA		Editable
2117-802-ECO-8791-EXHST_HDR_B	B		□	L	0120			4	EA		Editable
2117-802-ECO-LOCKING	B		□	L	0130			1	EA		Editable

The bottom part of the screenshot shows a 'Differences' dialog box with a table comparing component quantities between the current order (A) and the new MBOM (B).

A/B	Instance	Field Description	A	B
#		Component Quantity	16,000	8,000

Disassembly

Disassembly due to Engineering Change

The screenshot shows the 'Disassemble' dialog box in SAP. The 'Item Category' is set to 'L Stock Item' and the 'Plant' is '0001'. The 'Assembly Info' section shows a table with one assembly: Operation Activity 10, Component Quantity 1,000 EA, Serial Number 16, Batch, and Storage Location 0001. The 'Disassembly' section has a checkbox for 'Temporary Disassembly' which is unchecked. Below it, 'Disassembly Quantity' is set to 1 EA, 'Storage Location' is 0001, and 'Stock Type' is 'X Quality inspection'.

The screenshot shows the 'Disassemble' dialog box for a BOM item. The 'Component' is '2117-802-ECO-8791-EXHST_HDR'. The 'Assembly Info' section shows a table with one assembly: Operation Activity 10, Component Quantity 1,000 EA, Serial Number 24, Batch, and Storage Location 0001. The 'Instances (4)' section shows a table with two instances: Instance 1 (BOM Item Instance 1, Reference Designator 10, Operation Activity 10, Serial Number, Batch, Storage Location, Disassemble checked, Temporary checked) and Instance 2 (BOM Item Instance 2, Reference Designator 10, Operation Activity 10, Serial Number, Batch, Storage Location, Disassemble unchecked, Temporary unchecked).

After changes from the new MBOM are incorporated into the order-specific routing, you can see them in the Component List Workspace.

You can select the component marked for disassembly and click the Disassemble button in the menu above. In the dialog that appears, you can:

- Define whether the component shall be temporarily or permanently disassembled
- Pre-define stock type (blocked, inspection, general use or undefiled) and storage location for components to be disassembled

In case the stock type is set to Undefined in the order-specific routing for a component, the operator will be asked where to return the component and will have to pick the stock type from the drop-down list during disassembly action.

If there were new components added or some components marked for disassembly (they will have “-” negative qty) they will be also listed in the Component Assignment Workspace and must be assigned to existing or new operation activities.

The screenshot shows the 'Component Assignment Workspace' in SAP. The table lists components and their assignments to operation activities. A red arrow points to the row for component 2117-802-ECO A 0120, which has a quantity of 1- and is assigned to operation 50003479-01-0010.

Component	Item Cat.	Ref. De...	Item	Ph...	Status	Quantity	Assigne...	Unit	Operat	Operation/Group/Act...	Description	R...	Segm...	Status
2117-802-ECO L	L		0010			1	1	EA	0020	50003479-01-0010	Install Components			Partially confir
2117-802-ECO L	L		0020			1	1	EA	0020	10	Install Components			Produce In Process
2117-802-ECO L	L		0030			1	1	EA	0010	0020	Install Rest			Released
2117-802-ECO L	L		0040			1	1	EA	0020	20	Install Rest			Produce Initial
2117-802-ECO L	L		0050			1	1	EA	0010					
2117-802-ECO L	L		0060			4	4	EA	0020					
2117-802-ECO L	L		0070			1	1	EA	0020					
2117-802-ECO L	L		0080			1	1	EA	0020					
2117-802-ECO L	L		0090			4	4	EA	0010					
2117-802-ECO L	L		0100			16	16	EA	0010					
2117-802-ECO L	L		0110			4	4	EA	0020					
2117-802-ECO A	A		0120			1-	0	EA						
2117-802-ECO A	A		0130			4-	0	EA						
2117-802-ECO A	A		0140			16-	0	EA						
2117-802-ECO L	L		0150			8	0	EA						
2117-802-ECO L	L		0160			4	0	EA						
2117-802-ECO L	L		0170			1	0	EA						

Disassembly

Disassembly due to Engineering Change

Perform Operation Activity

Serial Number1029

Install Rest (20)

Components to Disassemble

Components

Attachments

All (3)

Traceable (3)

Serial/Batch Number

Component	Assembly Type	Disassembly Type	Planned Qty	Returned Qty	Action
2117-802-ECO-09876-RUBBER_RNG Rubber Ring	Batch	Permanent	1 EA	0 EA	
2117-802-ECO-777435-FLG_HD_M6X12 Flange Bolt M6X12	Manual	Permanent	16 EA	0 EA	
2117-802-ECO-8791-EXHST_HDR Exhaust Header	Serialized	Permanent	4 EA	0 EA	

Components

Undo Start

Complete

Pause

Scrap

Hold

Record Defect

Print

Instructions

3D Viewer

Buyoffs

The Perform Operation Activity app has been enhanced to support disassembly scenarios with the ability to view the list of components to be disassembled via the new view “Components to Disassemble”. The column Disassembly type shows to the user whether this component shall be permanently or temporarily removed.

In case of temporary disassembly, the same component will appear under Components view at the same or different operation activity as it must be reassembled back.

Every assembly, disassembly and reassembly with the stock type and storage location for return is recorded into the Production Action Log report.

Product Genealogy allows to track the history of component disassembly and reassembly including serial, batch numbers, quantities as well as stock type and storage location information for returns.

Production Action Log

Standard

Filtered By (1): Production Order

Actions (24)

Action Message	Production Order	Operation	Operation Activity	Serial Number	Action	Performed At	Performed By	Reassembly	Info	Stock Type	Storage location
Order 1868707 with total quantity 1 EA ORDWCR has been released	1868707				Release	10.08.2020, 13:27:24	Julia Zinovieva				
Change for order 1868707 has been completed	1868707				Complete Order Change	10.08.2020, 13:27:24	Julia Zinovieva				
Operation 0020 has been released from the hold 7468 set by the order change	1868707	0020 (Install Rest)			Release Operation Hold	10.08.2020, 13:27:24	Julia Zinovieva				
Action Complete for product 1030 in OA Install Components has been performed	1868707	0010 (Install Components)	10 (Install Components)	1030	Complete	10.08.2020, 13:28:27	Julia Zinovieva				
Yield quantity 1 EA for operation activity Install Components has been posted	1868707	0010 (Install Components)	10 (Install Components)	1030	Confirm Yield	10.08.2020, 13:28:27	Julia Zinovieva				
Action Complete for operation activity Install Components has been performed	1868707	0010 (Install Components)	10 (Install Components)		Complete	10.08.2020, 13:28:27	Julia Zinovieva				
Action Start for product 1030 in OA Disassembly and Reassembly has been performed	1868707	0015 (Disassembly and Reassembly)	10 (Disassembly and Reassembly)	1030	Start	10.08.2020, 13:28:40	Julia Zinovieva				
Action Start for operation activity Disassembly and Reassembly has been performed	1868707	0015 (Disassembly and Reassembly)	10 (Disassembly and Reassembly)		Start	10.08.2020, 13:28:40	Julia Zinovieva				
Component 2117-802-ECO-G1310-GSKT_FLG_RING (serial number 16) removed from product 1030	1868707	0015 (Disassembly and Reassembly)	10 (Disassembly and Reassembly)	1030	Material Return	10.08.2020, 13:31:33	Julia Zinovieva			Quality Inspection	0001 (Finished Goods)
Component 2117-802-ECO-8791-EXHST_HDR (serial number 24) removed from product 1030	1868707	0015 (Disassembly and Reassembly)	10 (Disassembly and Reassembly)	1030	Material Return	10.08.2020, 13:31:51	Julia Zinovieva			Undefined	0001 (Finished Goods)
Component 2117-802-ECO-8791-EXHST_HDR (serial number 24) assembled in product 1030	1868707	0015 (Disassembly and Reassembly)	10 (Disassembly and Reassembly)	1030	Component Assembly	10.08.2020, 13:32:34	Julia Zinovieva			Undefined	0001 (Finished Goods)

RFC-enabled Function Modules Available in S/4HANA PEO 2021 OP



Remotely Trigger S/4HANA PEO Actions for Operation Activities

Manufacturers of complex products may use surface-mount technology (SMT) machines or other equipment in production lines to produce subassemblies. The machines perform automated actions such as start and complete, assembly of components, and collection of inspection data, etc. To support automation scenarios PEO provides the following remote-enabled function modules that you can use to remotely trigger actions for operation activities in the segment type **Produce** without any user action.

MPE_OA_EXEC_SAS_ACTION (Executes SAS Action)

Trigger this function module remotely from a smart tool or machine on the shop floor to execute actions from a status and action schema (SAS) in the system based on the import parameters.

MPE_COMPONENT_ASSEMBLY (Posts a Component Assembly)

Trigger this function module remotely from a smart tool or machine on the shop floor to post goods movements for components in the system based on the import parameters.

MPE_OA_EXEC_GETINSPCHAR (Get Inspection Characteristics of an Operation Activity)

Trigger this function module remotely from a smart tool or machine to retrieve inspection characteristics for operation activities from the system based on the import parameters.

MPE_OA_EXEC_RECORDRESULTS (Record Results for Inspection Characteristics of an Operation Activity)

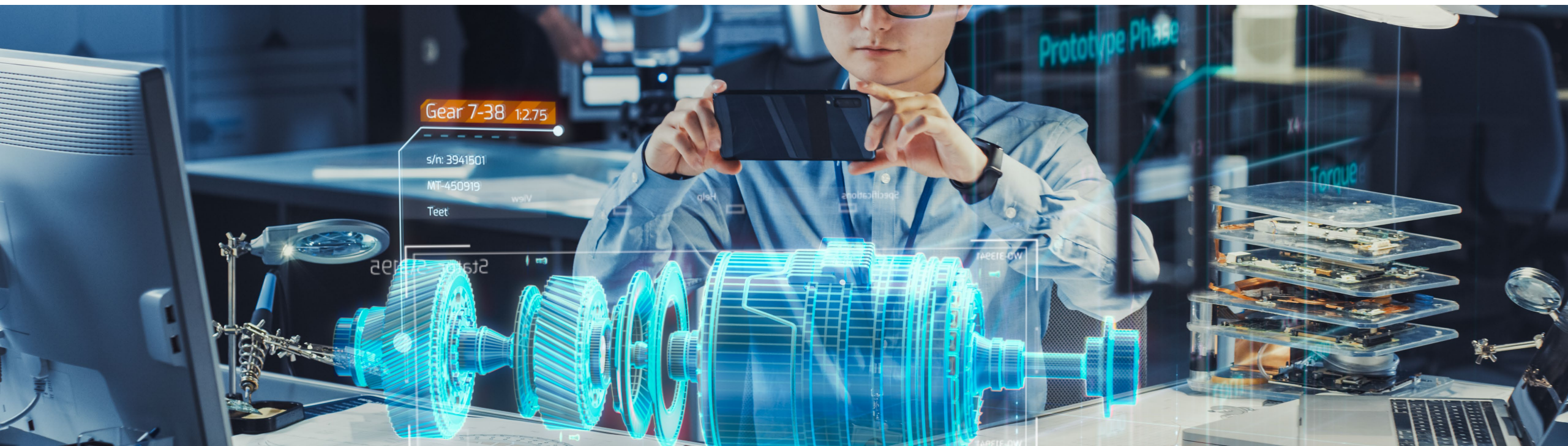
Trigger this function module remotely from a smart tool or machine to record inspection characteristics in the system based on the import parameters.

MPE_OA_EXEC_DEFECT_CREATE (Create a Defect for an Operation Activity)

Trigger this function module remotely from a smart tool or machine to create a defect for an operation activity in the system based on the import parameters.

Note: The provided RFC-enabled function modules are all synchronous and single-action RFCs.

Machine Integration with PEO





NOVOMATIC

MES (PEO) im Rahmen der S/4HANA Implementierung OKTOBER 2021

FACTS & FIGURES • H1 2021

NOVOMATIC AG-KONZERN

UMSATZERLÖSE

629,3

IN MIO. EUR

EBITDA

162,9

IN MIO. EUR

CASHFLOW AUS
BETRIEBSTÄTIGKEIT

87,5

IN MIO. EUR

MITARBEITER
WELTWEIT

21.028

MITARBEITER
ÖSTERREICH

~3.000

MITARBEITER
HEADQUARTER

~1.000

EXPORTLÄNDER

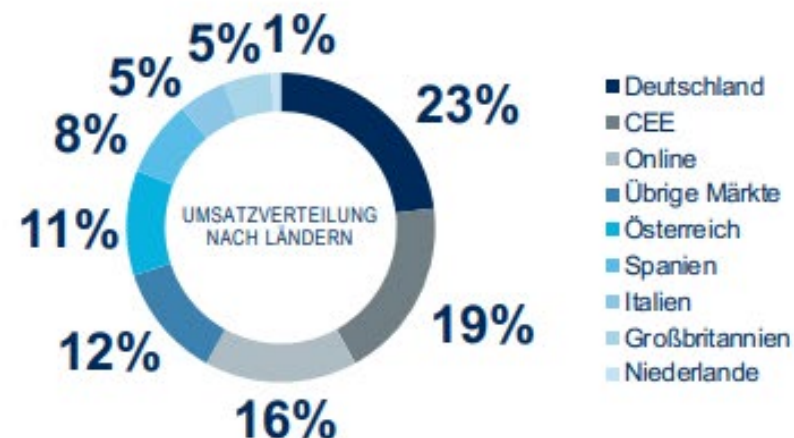
~90

LÄNDERSTANDORTE

>45

OPERATIV
TÄTIG SEIT

1980



PRODUKT & FERTIGUNGSTIEFE

STARK AUSGEPRÄGTE WERTSCHÖPFUNGSKETTE

Druckerei

Tischlerei

Metalltechnik

SGT inkl.
Werkzeugbau

Gehäuse-
fertigung
(EDP)

Montage

Geräte-
Endtest &
Game



Refurbishment
BGR

Kabel-
baum

Platinen-
fertigung

PCB Endtest &
Programierung

PC-Bau



SAP S/4HANA IMPLEMENTIERUNG

EINE KURZE ENTWICKLUNGSGESCHICHTE



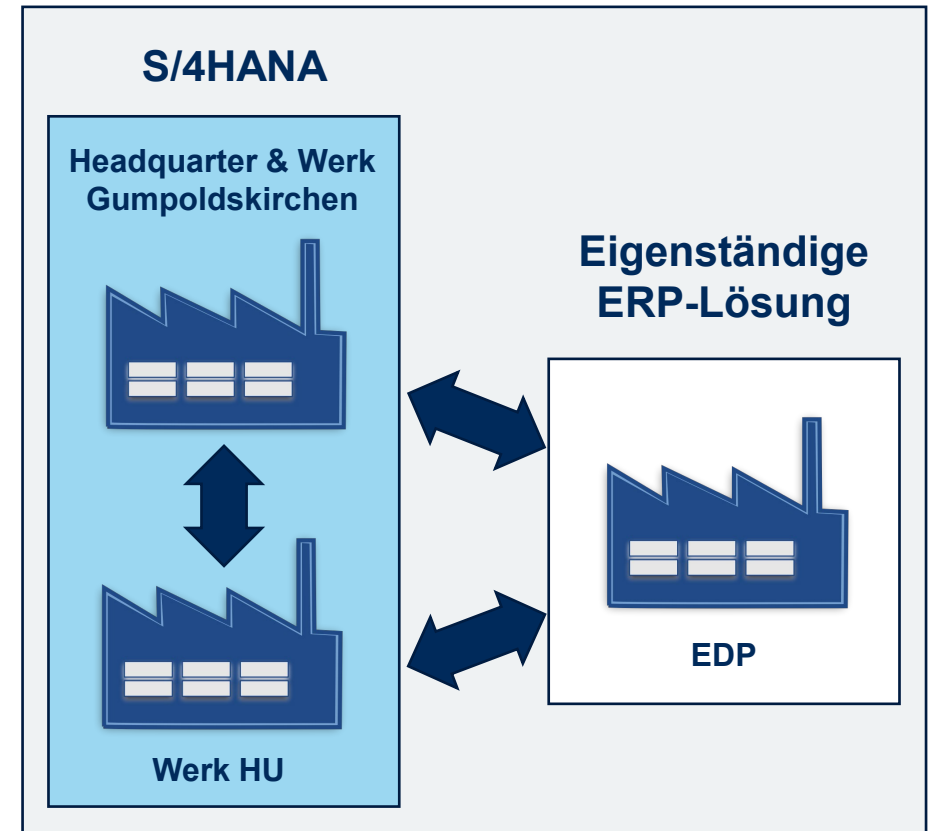
SAP-Module

- FI/CO
- SD
- EK
- MM
- PLM
- PP
- QM

IMPACTS

- (1) EWM
- (2) PP/DS & PEO
- (3) TM / COVID

PRODUKTIONSVERBUND



PEO-INTEGRATION

PEO-ABWICKLUNG IN VERBINDUNG MIT...

- Kundenauftragsstückliste
 - Kundeneinzelfertigung mit Variantenkonfiguration und ergebnisorientierter Stücklistenauflösung
 - SNR-Erfassung
- Maschinenanbindung von Platinenbestückungsanlagen mittels WebService
 - Erfassung von Maschinenzeiten, Verbrauchsmeldung chargengeführten Material und Vorgangsrückmeldungen
- PP/DS (Produktions- und Feinplanung)
 - MTS (Platinenfertigung, SGT, ...)
 - CTO (Montage)
- Umbauaufträge
 - Umbau von Halb- und Fertiggeräten
- QM-Integration
 - Fehlerabwicklung
 - Nacharbeit



PEO WORKER INTERFACE

NOVOMATIC WORKER USER INTERFACE

SPEZIELL DESIGNTES WERKER-UI FÜR DIE ABWICKLUNG VON FERTIGUNGS-AUFTRÄGEN AM SHOPFLOOR

Verwendung am Shopfloor

- Vorgangsrückmeldungen
- Zeiterfassung von Mitarbeitern
- Entnahme von Komponenten (z.B. chargengeführtes Material)
- Visualisierung von Arbeitspapieren (z.B. Arbeitsanweisungen)
- Bewertung von QM-Prüfmerkmalen
- FHM
- ...

Leiterplatte lasern (10)

Typ: Fertigen	Material: 4101010513	Verfügbare Menge: 121 ST	Auftragsmenge: 256 ST
Vorgang: 0010 (Leiterplatte lasern)	Materialkurztext: Platine P720/1 USB to serial Per.Contr.	Ausschuss: 0 ST	Vorgangsmenge: 256 ST
Auftrag: 10002518	Arbeitsplatz: 07PRM01 (CBA Laser)	Fortschritt: 135 ST	Status: In Bearbeitung

[Aktionen](#) [Komponenten](#) [Anlagen](#)

Arbeitszeiterfassung aus

Vorgang anhalten

Vorgang teiltrückmelden

Vorgang starten zurückn.

Vorgang abschließen



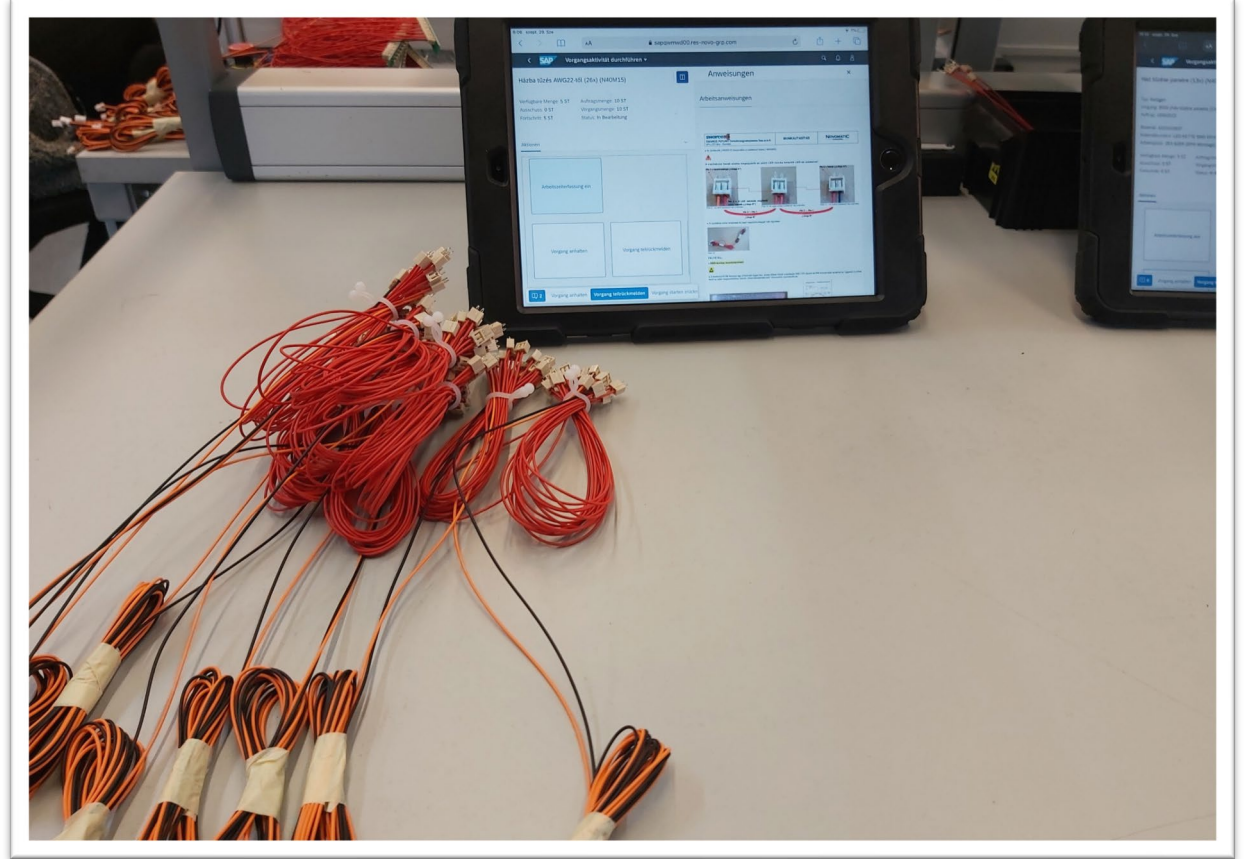
BEISPIELE – KABELKONFEKTION I

PEO IN REAL LIFE



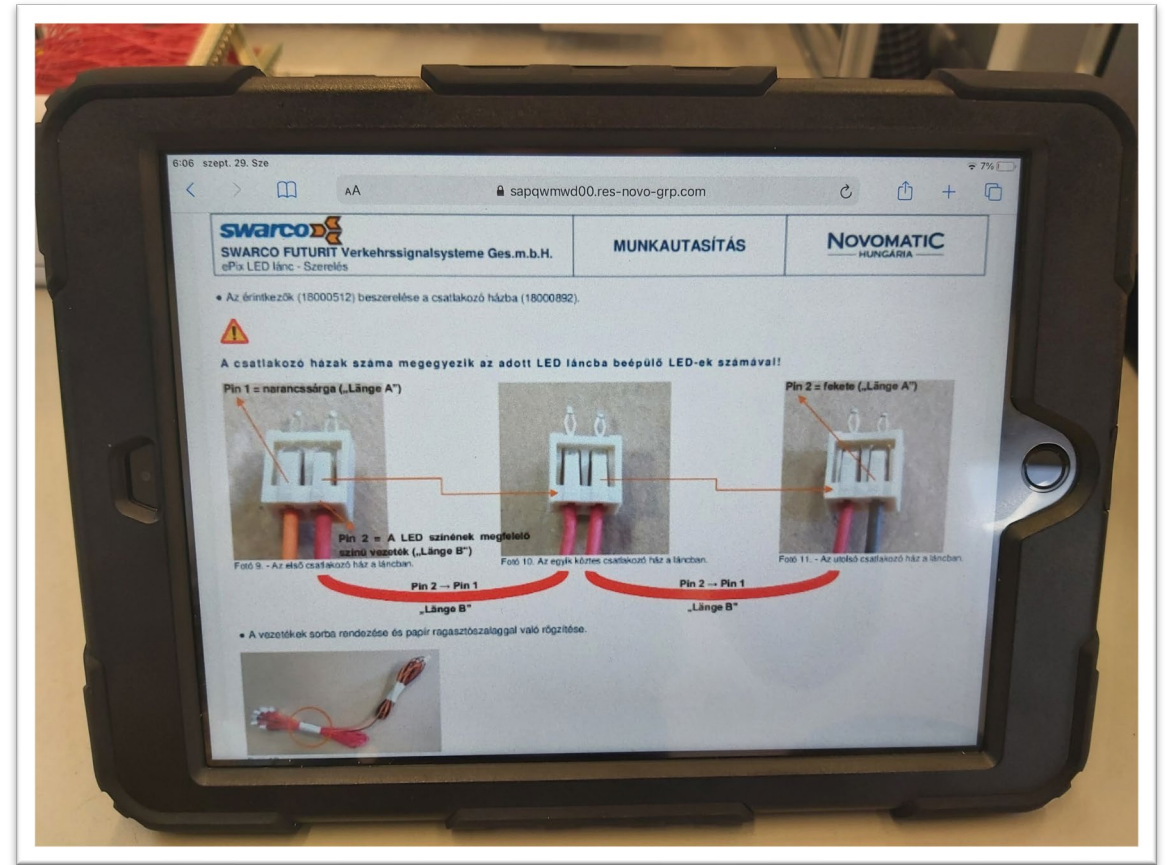
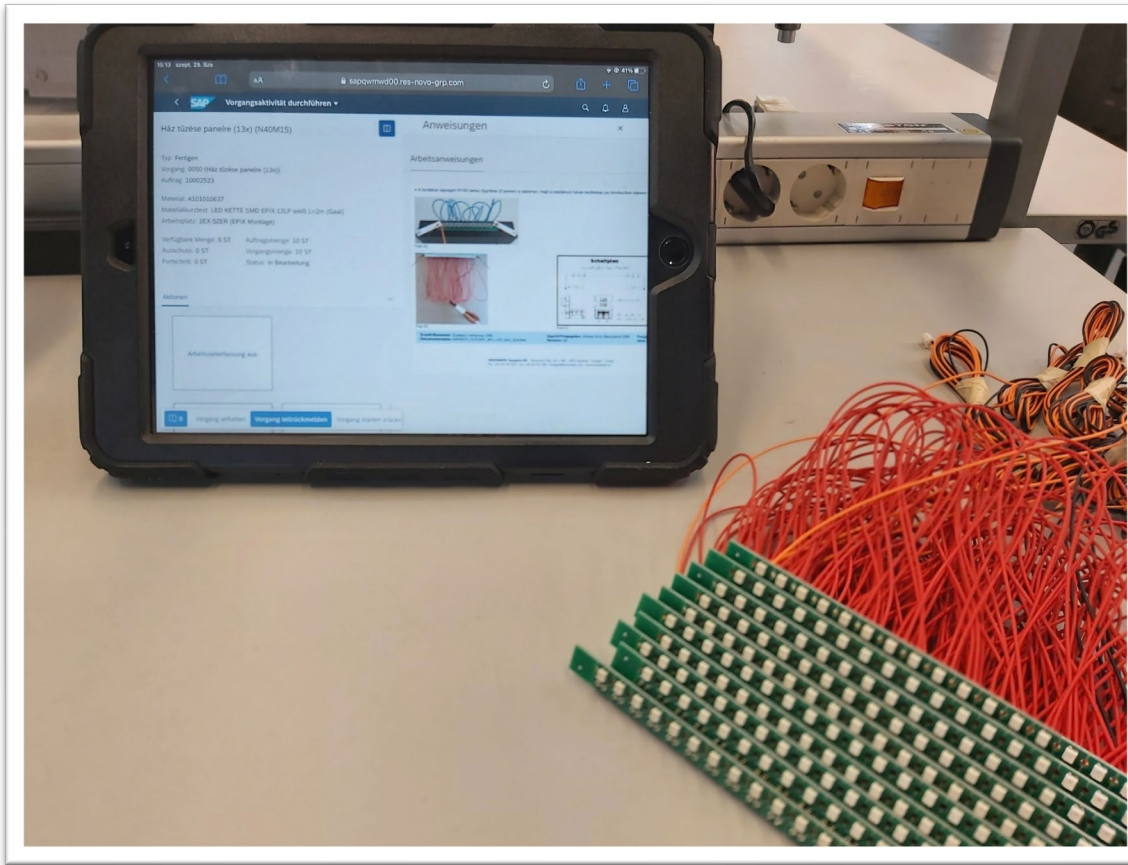
BEISPIELE – KABELKONFEKTION II

PEO IN REAL LIFE



BEISPIELE – KABELKONFEKTION III

PEO IN REAL LIFE



What comes next?

CTO+ Customer Engagement Initiative



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