BSH Home Appliances Group

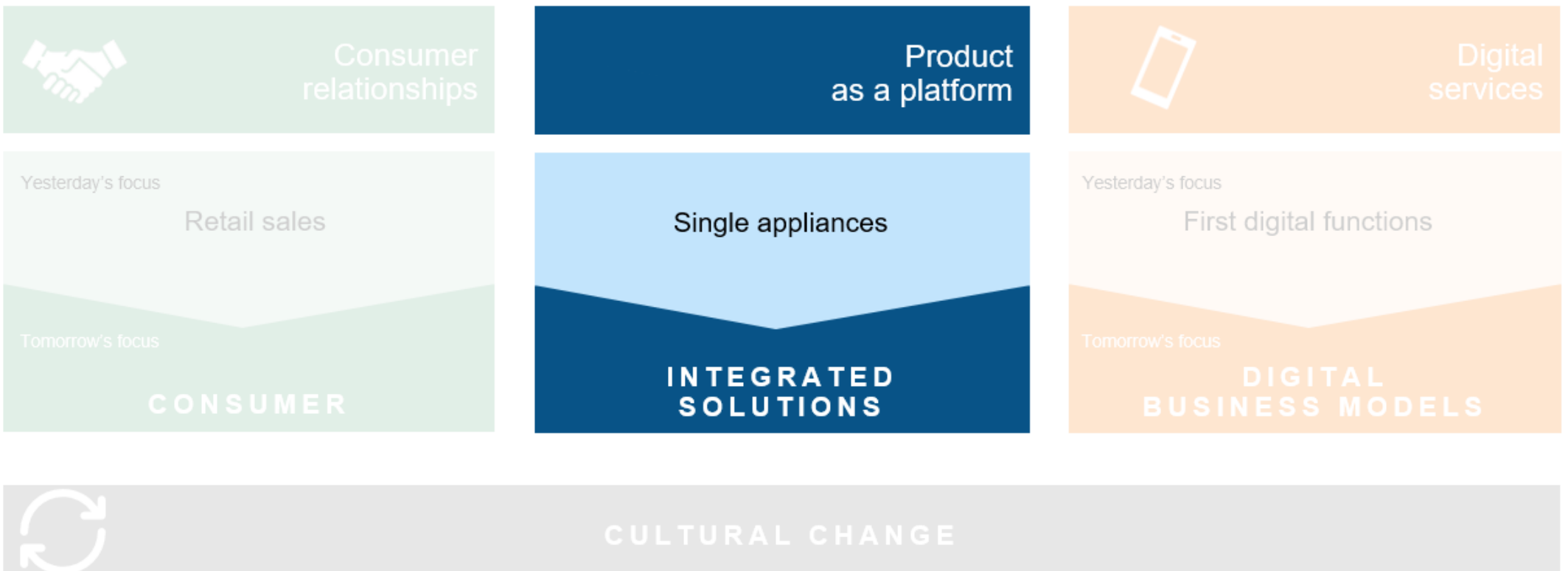
B/S/H/

PLM 2.0 as enabler for Hardware+

2020-11-11

Sabine Ardey

BSH | Hardware+ is based on three pillars and requires cultural change



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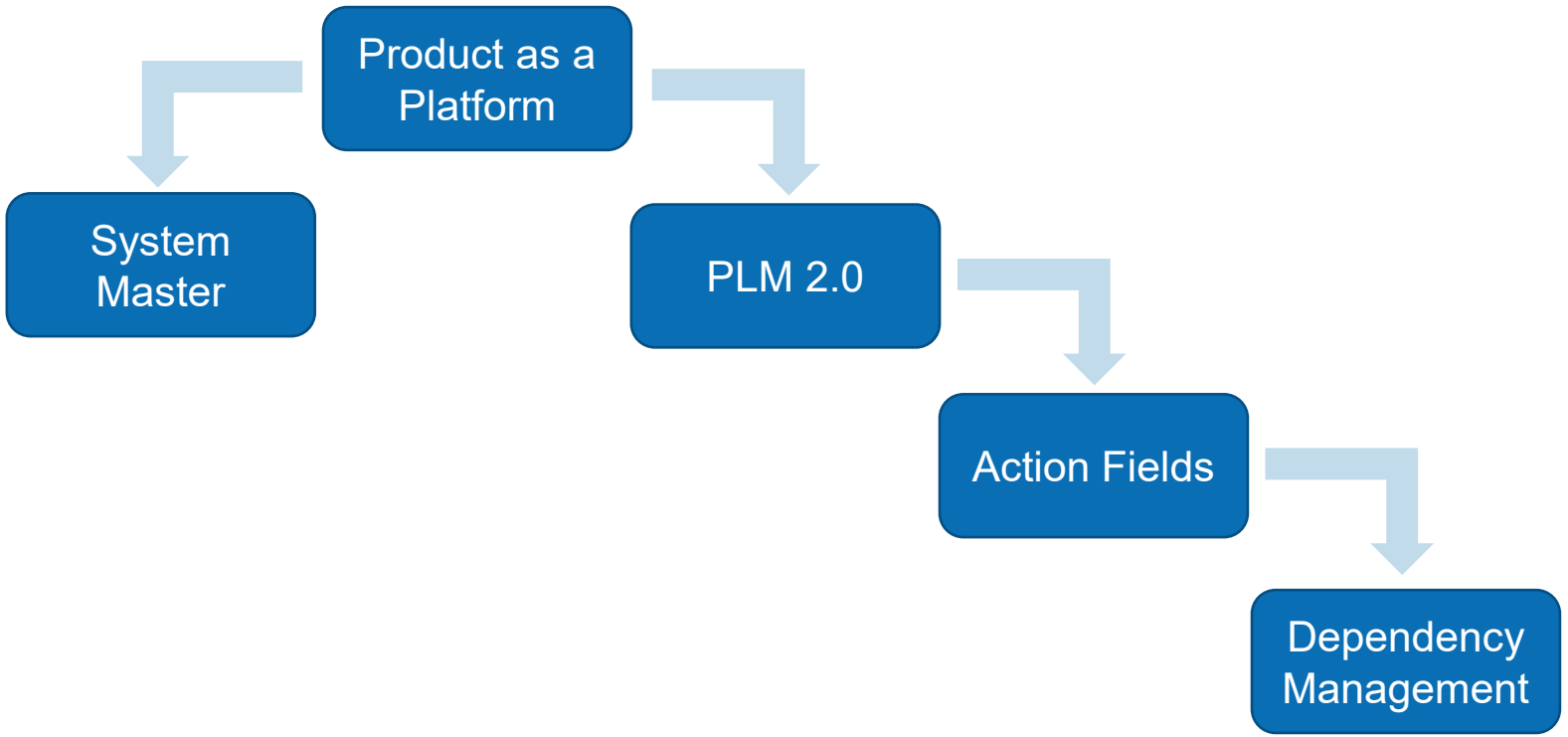
Agenda

Drill Down



What's next?

from PLM to SysLM

Drill Down - Product as a Platform

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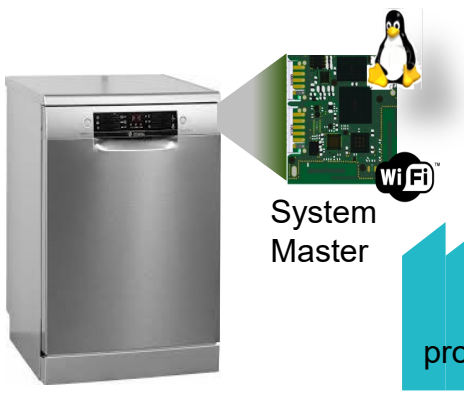
BSH | Product as a Platform

Product Development

Production

SW-Updates over Lifetime

Hardware, Electronics & Software Development



System Master

In line programming

HCA: Home Connect Application Server

FDS: Firmware Distribution Services

CDS: Content Distribution Services

PLM 2.0 Digital Backbone

Product Configuration & Dependency Management

Firmware & Content Development with ALM Tool Chain

Digital Engineering Backbone

TEAMCENTER

Polarion ALM

SAP

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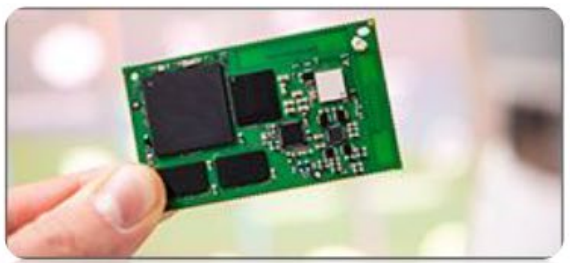
SystemMaster

SYSTEMMASTER



… is „the digital brain“ …

…based on Linux OS …

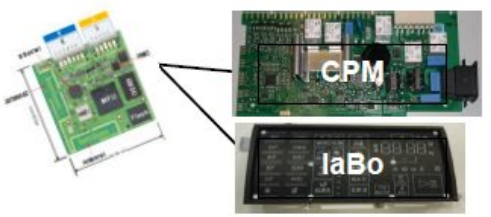
… to connect us to the Internet

Wi Fi™ Home connect

… with highest standard of security!

And with our new common BSH architecture inside …

… our SyMa controls other electronics …



…executes recipes / downloads new features…

…enables „predictive maintenance“ & better understanding of use,..

… creates AI on the edge & self learning Systems…

…allows to use Open Source,…

… and lets others be creative for us!

open source initiative

BSH | Engineering Backbone

for efficient distributed development of mechatronic products

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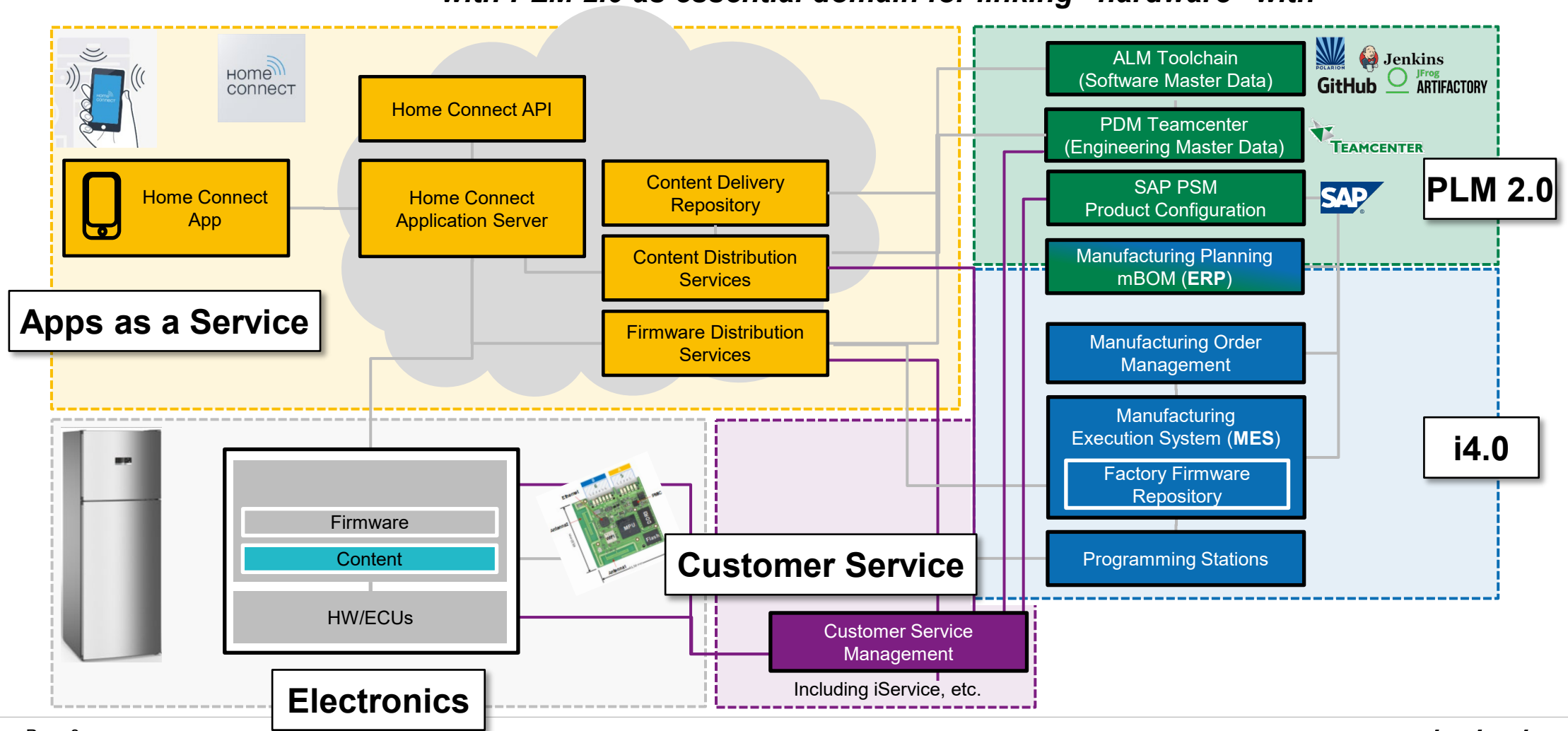
Product as a Platform| Hardware+ Architecture

with PLM 2.0 as essential domain for linking "hardware" with "+"



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PLM 2.0 | Action fields

PLM 2.0 focusing on SystemMaster enabling processes

PLM 2.0
Digital Engineering
Backbone

Global standard SMM

(example GV650)

System Master as the global connectivity standard for BSH

Dependency Management

- **Dependencies** between SW/HW/RAC to be identified and checked for SW updates **over product lifetime**

ALM/PLM Processes

- More SW focus (FW, Content) and regular updates require **standardized ALM Toolchain**

Product/Variant Configuration Management

- **Amount of possible combinations** for variants needs **PLM supported configuration management**

Manage data complexity

- dependencies
- Interfaces SW/HW
- new components
- (…)

Improve efficiency

- Automatic processes
- Check of VA/VO
- Check of BOMs
- (…)

PLM 2.0
Digital Engineering
Backbone

SOFTWARE UPDATE

UPDATE COMPABILITY CHECK

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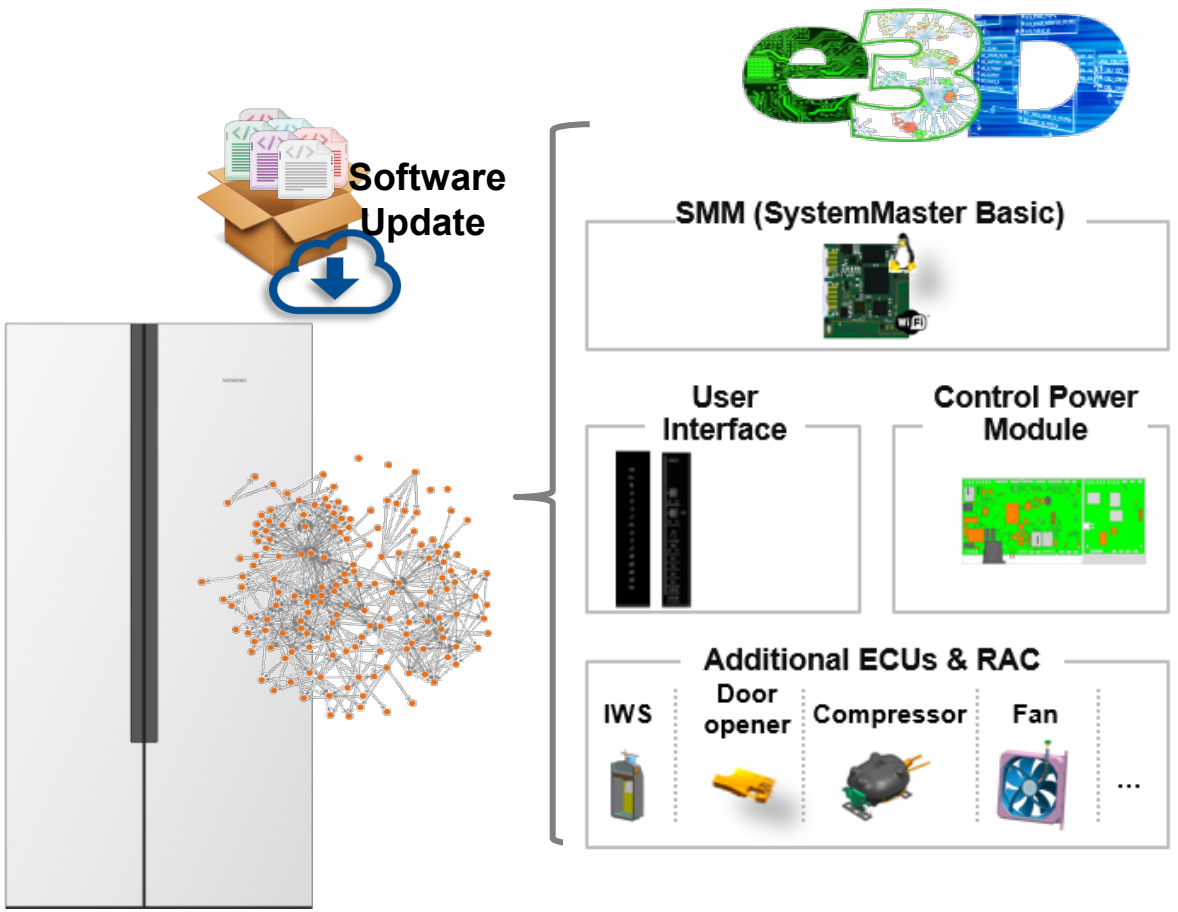
PLM 2.0 Action Fields | Dependency Management

Parts & Modules influencing the Software



Hardware Identification
→ they are **able to provide the identification information** to the Home Appliance
→ Electronic (**PCB**) with **(D)Bus connection**

Firmware Identification
FW comprises **all kind software**, which is used to provide basis functionalities of an ECU.

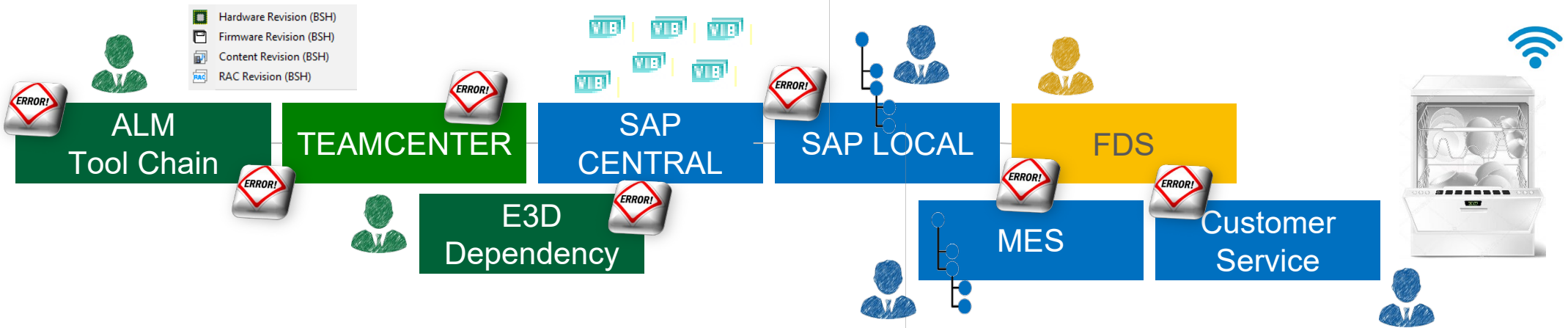
RAC Identification (Restricting Additional Component)
they are **not able to provide the identification information** to the Home Appliance
→ no (D)Bus connection
→ **have an influence on the FW** running on the ECU

ECU = Electronic Control Unit
FW = Firmware
HW = Hardware
RAC = Restricting Additional Component

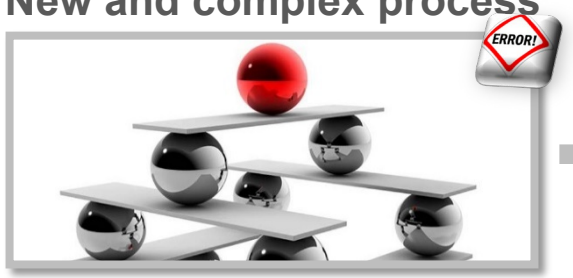
PLM 2.0 Action Fields | Product as Platform “Dashboard”

PLM 2.0 Digital Engineering Backbone

to avoid small unknown errors along the process chain with fatal effect on production



New and complex process



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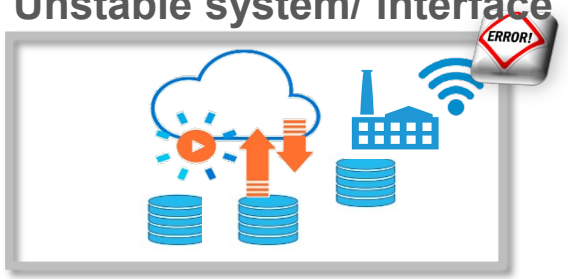
Unstable system/ interface



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Time consuming and difficult troubleshooting

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What’s next? from PLM to SysLM

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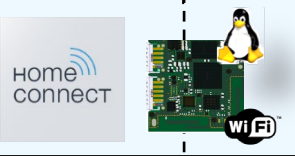
BSH | Evolution of PDM / PLM

2011 2012 2013 2014 2015 2016 2017 2018 2019 2020



TeamCenter Next Generation (TCNG)

- Renewal BSH **PDM product data management**
- **New core processes** (e.g. eng. change, release)
- Focus on **TeamCenter**

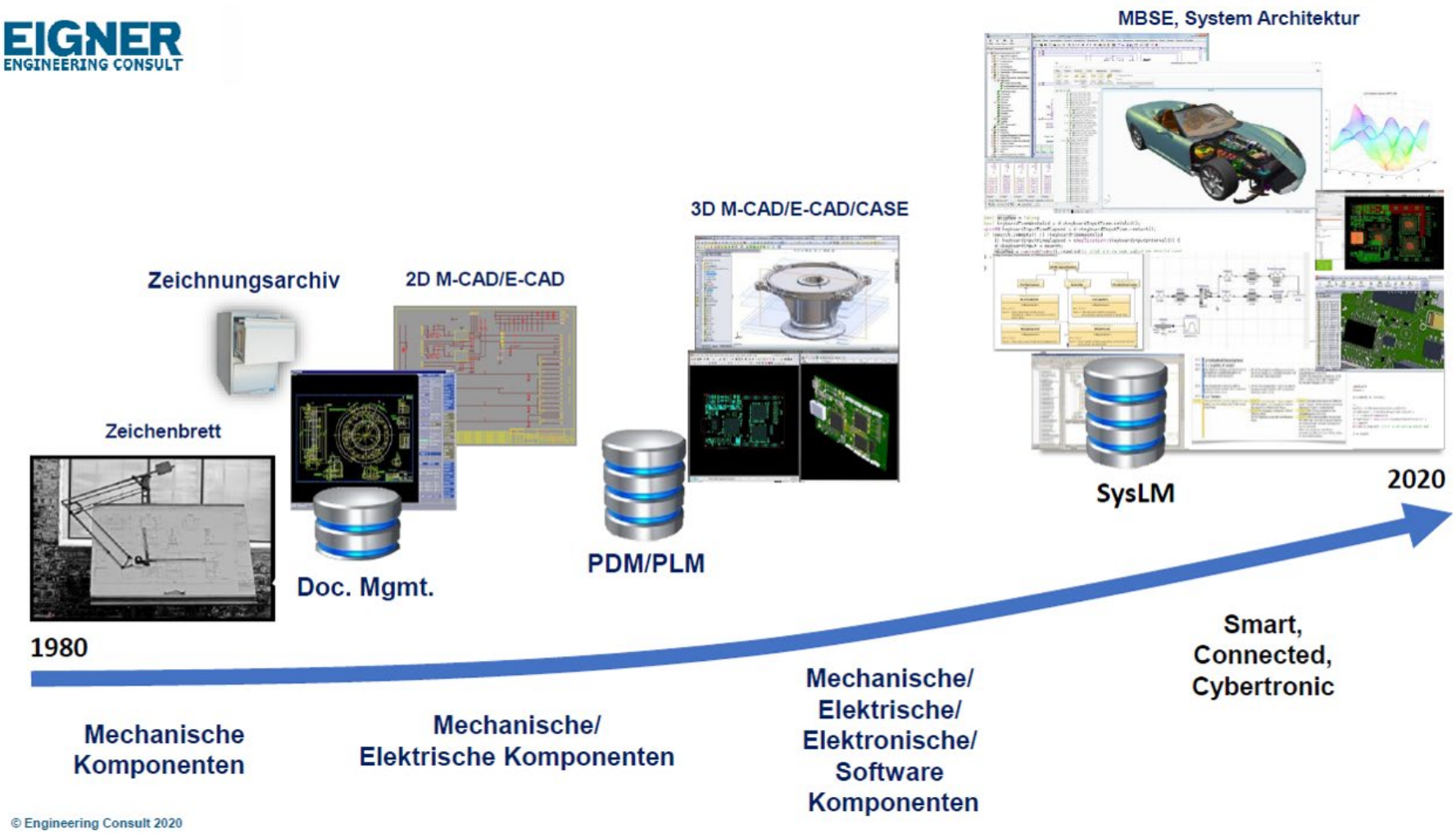
PLM 2.0
PACT & NextLevel

- **PDM process adaptations to NextLevel**
- **PACT modularization** into data models
- **Extended scope to whole value chain**

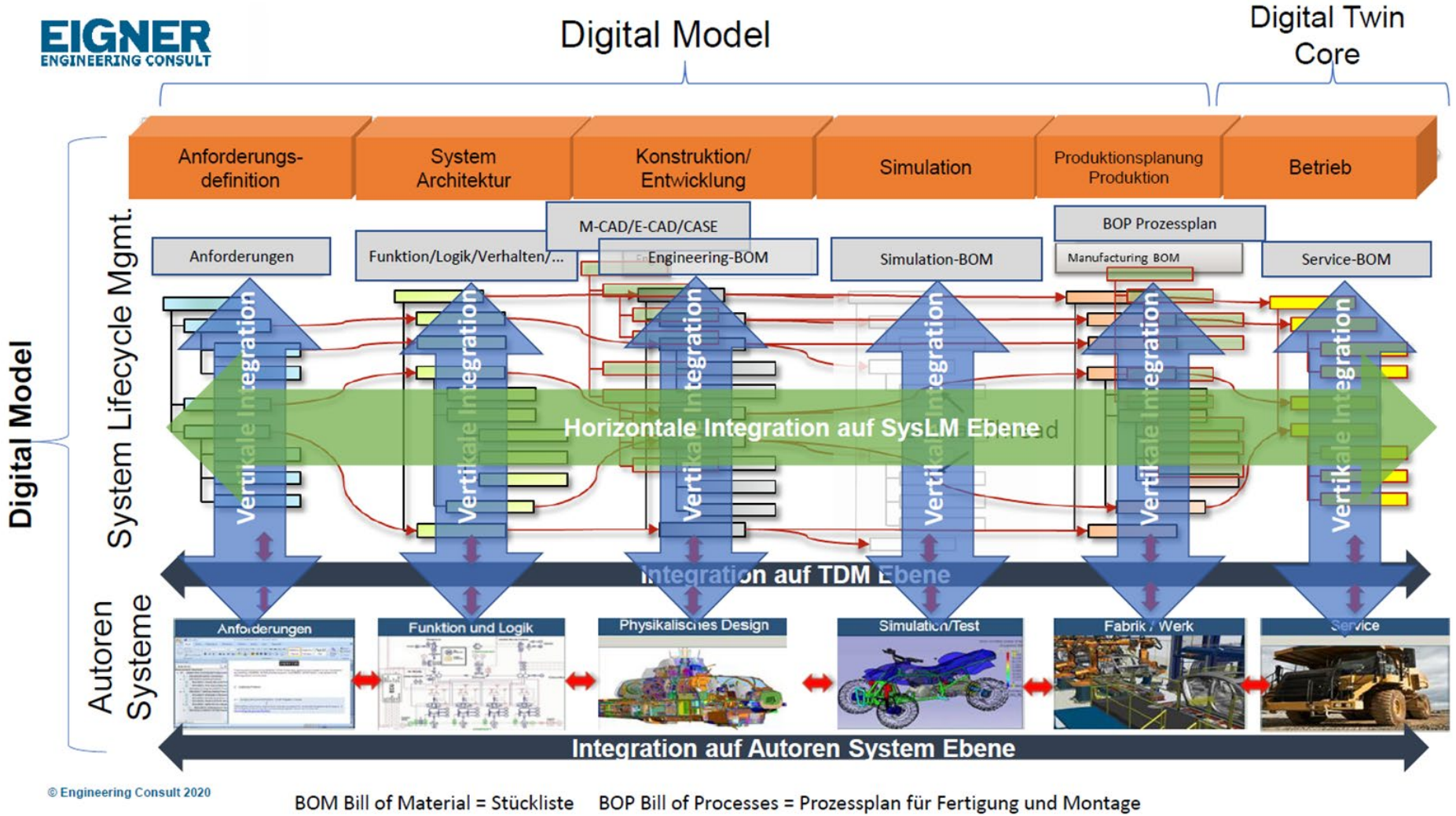
PLM 2.0 Re-focus
Hardware+ / SystemMaster

- **Focus**: **SystemMaster / Paap**
- **New PLM target IT architecture** (SAP, TeamCenter, Polarion / ALM)
- **Speed-up by agile stepwise approach** and **SAFe**

Prof. Eigner | Evolution from PLM to SysLM



Prof. Eigner | SysLM - Horizontal & Vertical Integration



Thank you!