B/S/H/

Digitalization as crucial enabler for future production

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i4.0@BSH

2022-07-21
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i4.0@BSH
Agenda / main topics

- Strategy i4.0@BSH

- Organization of i4.0@BSH

- IT Architecture and exemplarily solutions

- People and enablement

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i4.0 B/S/H/
Smart Manufacturing

Vision

i4.0@BSH drives the
<u>digital transformation</u>
to a competitive and <u>user centric</u>
<u>smart</u> <u>manufacturing</u>
boosting <u>operational excellence</u>
across <u>all value streams</u>*.

* VS: Source - Make - Deliver (SC, LO, PD, incl. QM)

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Focus points

People, Processes, Organization

Digital Engineering & Digital Twin

Data Analytics / AI

Connected Automation and Smart Devices

Traceability

Monitoring Alerting, Steering
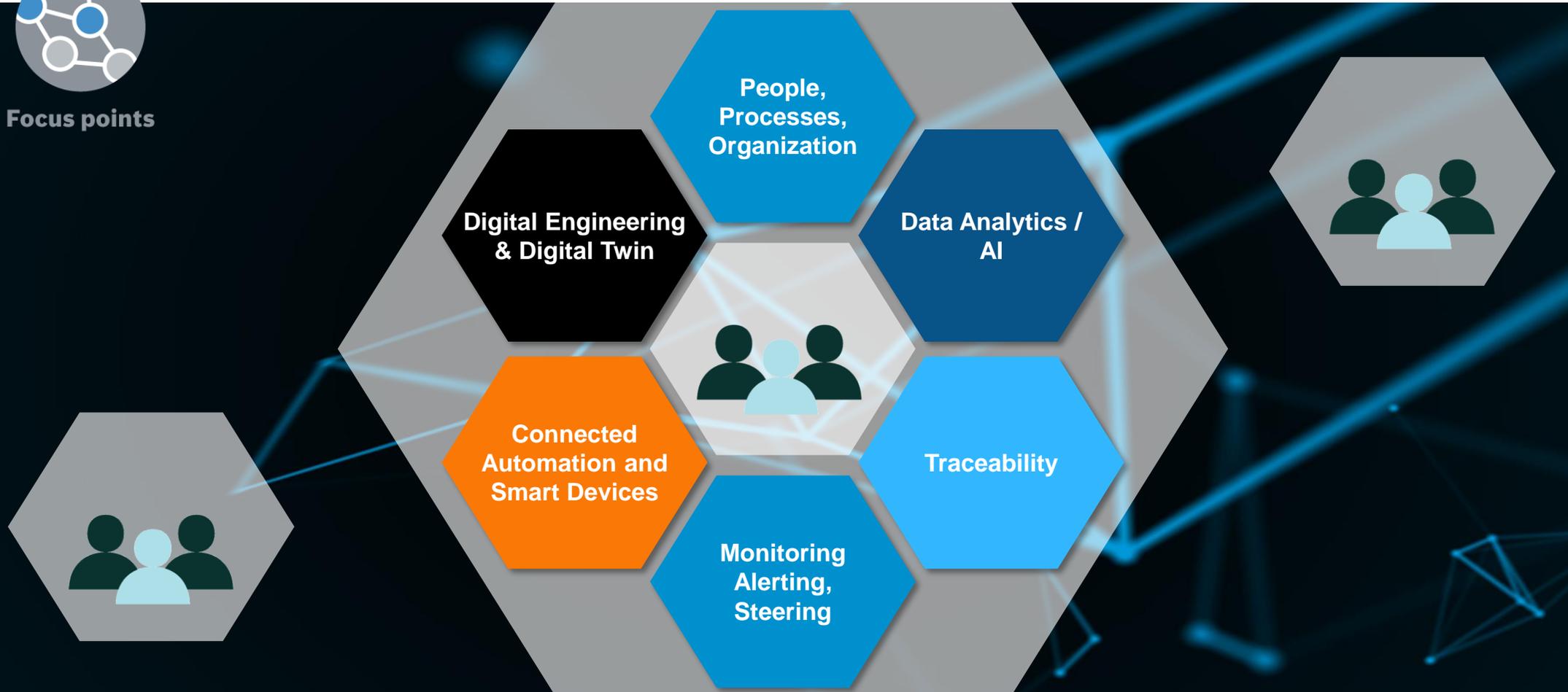
i4.0@BSH – Progress Measurement

Progress of i4.0@BSH is measured based on i4.0 maturity levels*

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Smart Manufacturing

i4.0 degree of maturity

Focus of i4.0 strategy

Computerization + Connectivity	Visibility	Transparency	Predictability	Adaptability
1-2	3	4	5	6

What happens?
"See"

Why does it happen?
"Understand"

What will happen?
"Be prepared"

How can an autonomous reaction succeed?
"Self optimization"
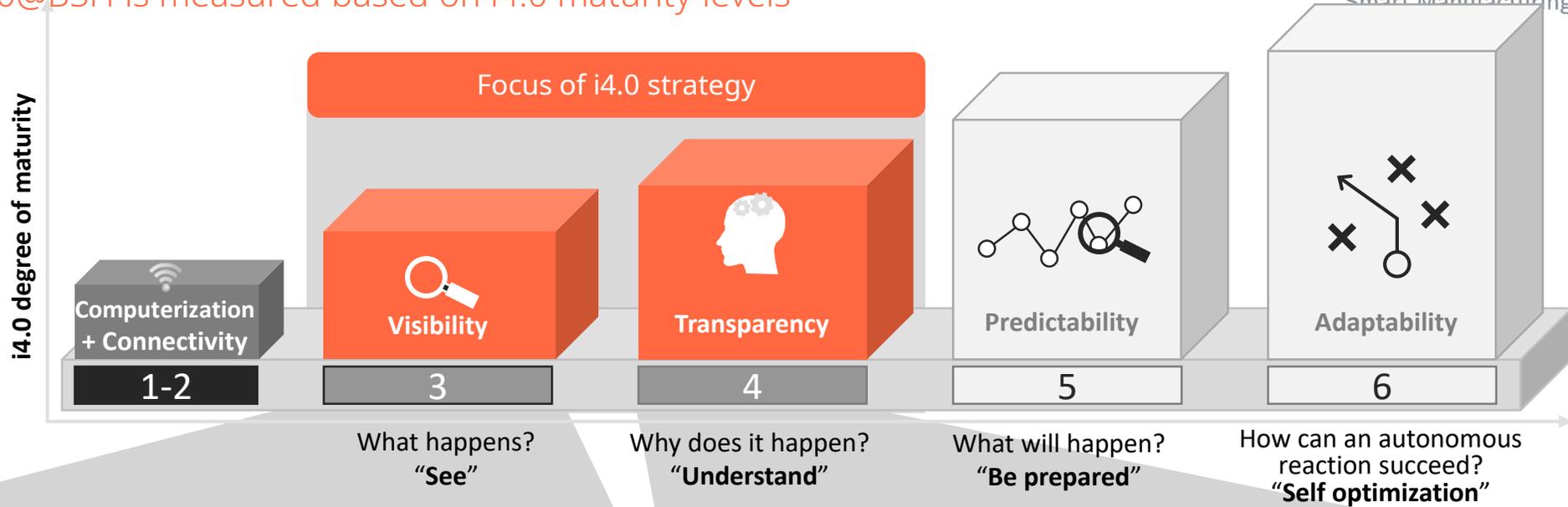
All relevant **data is collected and linkable in an automatic way** (see what is happening „live").

Deviations from expected results **are automatically analyzed** for probable root causes based on past data.

Target 2025: rolled out throughout BSH

Target 2025: tested in selected Lighthouse factories

* basic model by Acatech

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How are i4.0@BSH and BPS@BSH connected?

i4.0@BSH increases in BPS transparency and provides solutions for continuous improvement

Transparency

Data Analytics

Condition Monitoring Syst.
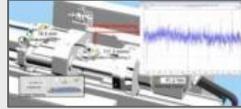
Tool Mngt. / IoT Gateway

Prod. Perfor. Manager (PPM)

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Improvement

Fleet Mgt. Intralogistics

Mobile Plant Maintenance

Digital Support for Workers

### Digital Cobots Planning

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BPS System CIP Approach

BSH Production System

* CIP: Continuous Improvement Process
  BPS: BSH Production System
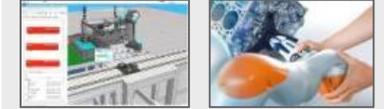
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Connection of Customers to Dev Teams to request roll-outs / developments

Requested developments of new features need to be aligned in global roadmaps (agile set-up)

„Customer" via Specialist Teams

- People, Processes, Organization
- Digital Engineering & Digital Twin
- Data Analytics / AI
- Connected Automation and Smart Devices
- Monitoring Alerting, Steering
- Traceability
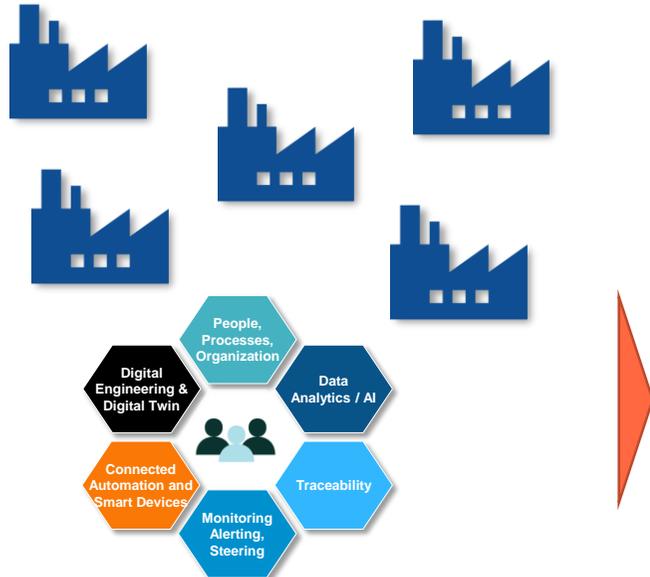
underlying demand process
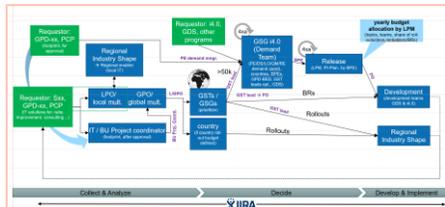
Business Process Engineer („BU PO")

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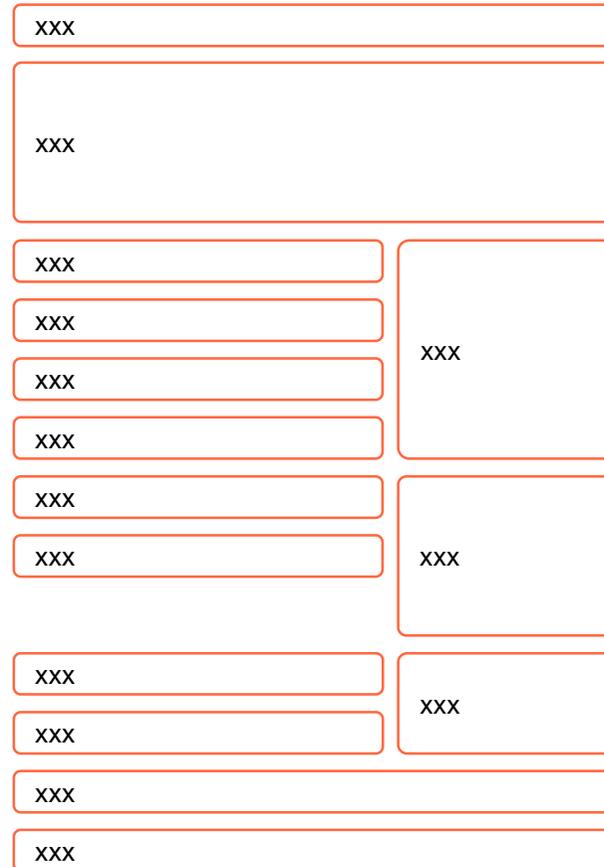
„Development" Teams (BU & IT)

BU: Business

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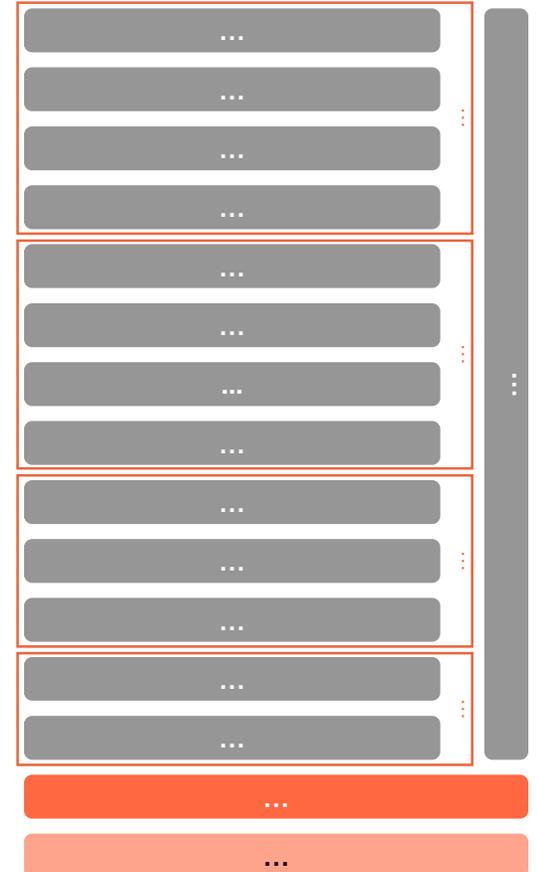
We reach our target picture based on our platform strategy
Successful local activities are standardized for beneficial scaling

Benefits

BSH

Regional

Local

Low — Standardization — High

- Harmonization / standardization pilots
- Local projects
- Global roll-out

PDM* platform ⟷ **ERP* platform** ⟷ **Cloud**

MES* platform

Shopfloor

* PDM: Product Data Management
ERP: Enterprise Resource Planning
MES: Manufacturing Execution Platform

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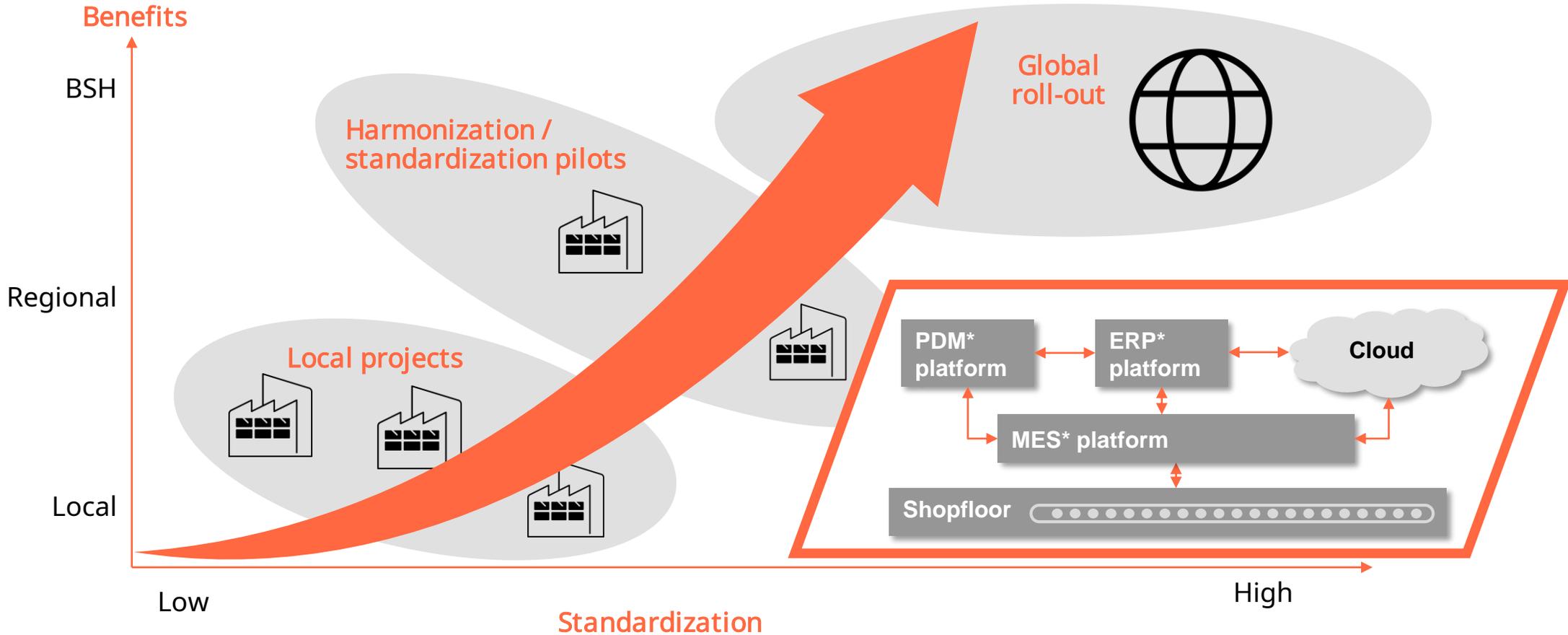
We reach our target picture based on our different platforms
Connected platforms ensure the reuse and consistency of data

amazon web services™

SIEMENS

SAP

Mobile

Digital Engineering Tools by IT*

MES PLATFORM Microservices by IT

Microservices by Business

kubernetes

Local Containers

SQL w/ Appl.

PDC
Plant Data Collection (PDC)

DSW
Digital Support for Worker (DS4W)

System Master

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AGV

AGV

Robots and Stations

Test Stands

Screw Station

Side panel

SHOPFLOOR

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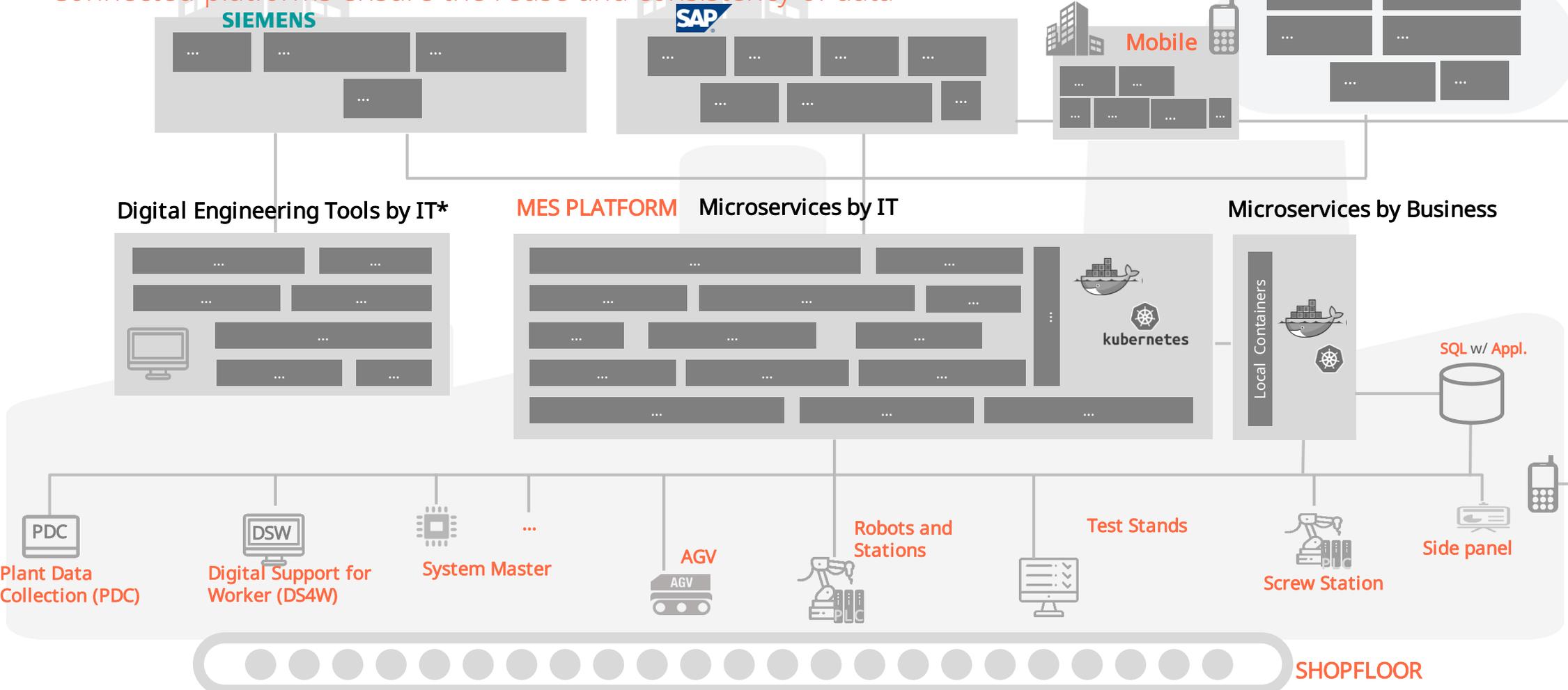
Digital Engineering @ BSH
Powerful system integration where we describe our plants and products in one central system

i4.0 B/S/H/
Smart Manufacturing

Product Development

SIEMENS
Teamcenter Manufacturing Digital Twin

Change and Release
Parameter
Factory Structure
Work Instructions
Documents

Architecture Modeler

EAWS Ergonomic Assessment

Line Balancing

MTM Analyses

Easy Plan / MTM

PGL / Prokon

Abstract & Dynamic Simulation

Plant Simulation

Material Flow Simulation

Robot Simulation & Programming

Process Simulate

VR Integration

Ergonomics

Equipment Management

Resources / fixtures

Tool Data Management

AutoCAD

Dimensioning

Factory Layout

Line Designer

3D Line Design

Advanced Modelling

© Modell Authoring

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Digital Support for Workers (DS4W) & Augmented Assembly Assist (A³)
Huge value due to connected systems and re-use of data

DS4W as standard tool in numerous BSH factories

A³ developed in BSH i4.0 Lighthouse Factory Dillingen

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Analytics Platform in Cloud with advanced analytics at scale

For analytics at scale & data driven decisions analytics pillars access same data fed by standard pipelines
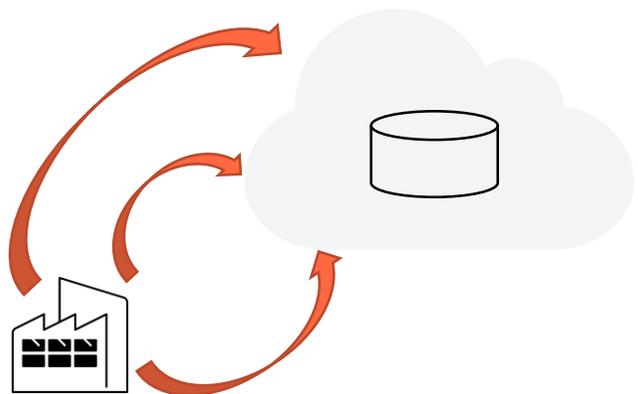
Process Monitoring
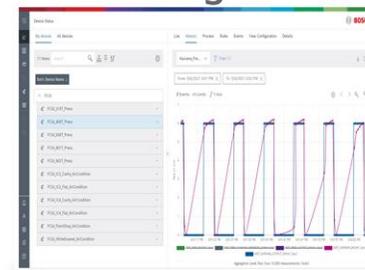
Self-service Analytics

Data Science & AI

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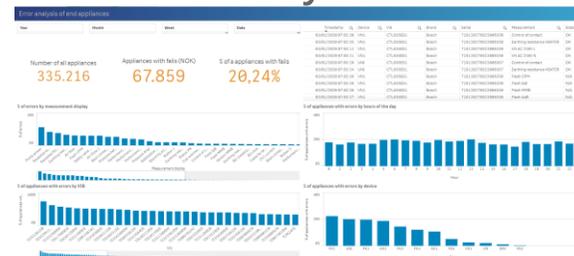
We reach full transparency of Data & Information flows in our factories
Implementation of Data & Information Value Stream (DVS/IVS) into our BSH production landscape

DVS as part of factory reporting

IVS (e.g. for purchasing of equipment)

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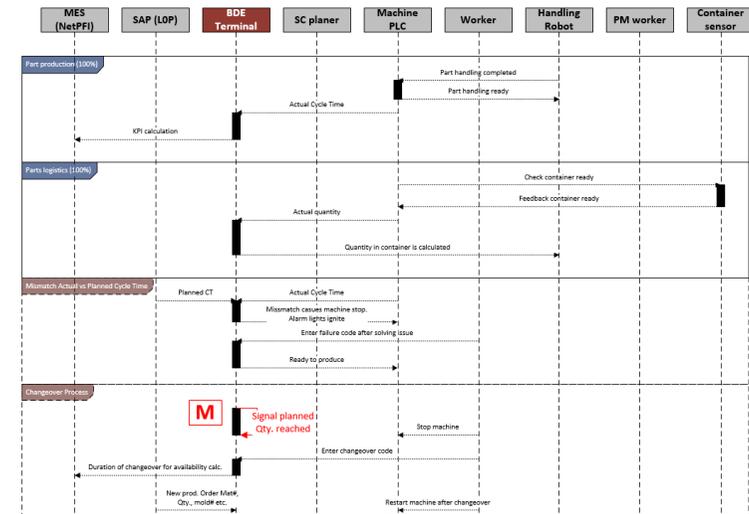
People are a key Focus Point of i4.0@BSH
Skilling up to maximize the full potential is driven via the global multipliers network

„i4.0 Driver"

Drive modernization of factories with i4.0

"i4.0 Implementer"

Define & implement i4.0 solution

"i4.0 user"

Work in an i4.0 environment

i4.0

Central Multipliers

Product Families Global Multipliers

Country / Region Global Multipliers

Factory i4.0 Multipliers
LPO's, LKU's, MES Coordinators

Factory Teams

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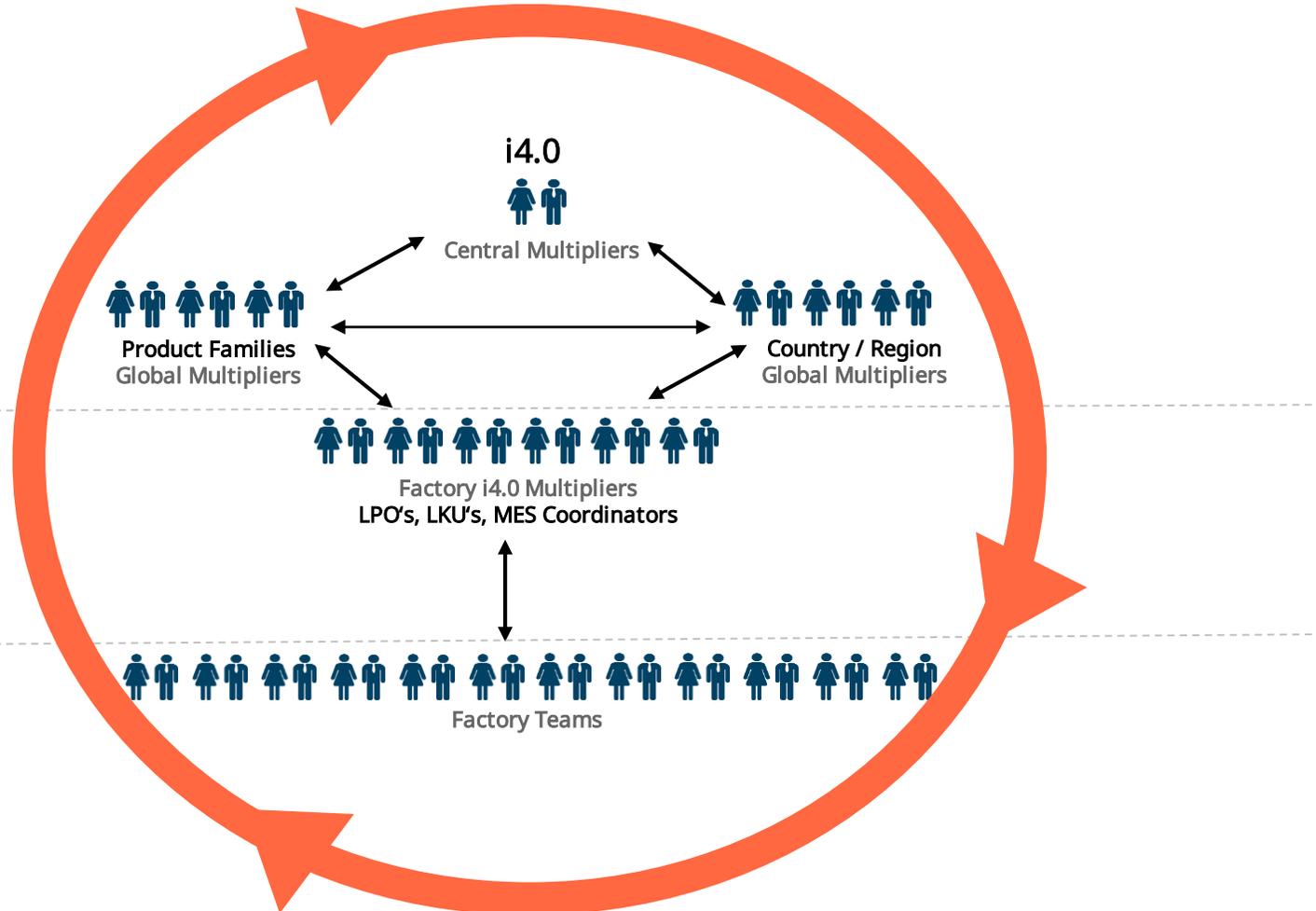
People are a key Focus Point of i4.0@BSH
Numerous global / local enablements are provided

Global focus, e.g.

„general" enablement

Common trainings and "topic talks"
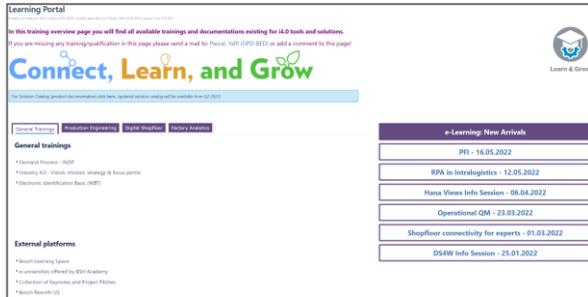
i4.0 Learning Portal und Calendar

Creation of Learning Journies

Local focus, e.g.

Enablement of local requirements (e.g. specific techs.)

InnoLabs

Specific trainings

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