Industry 4.0 @ Bosch Rexroth

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Rexroth
Bosch Group

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Bosch dual strategy

i 4.0
CONNECTED INDUSTRY

Lead Provider

Rexroth Bosch Group — Drive and Control Technology

BOSCH — Bosch Software Innovations

BOSCH — Bosch Assembly Systems and Special Machinery
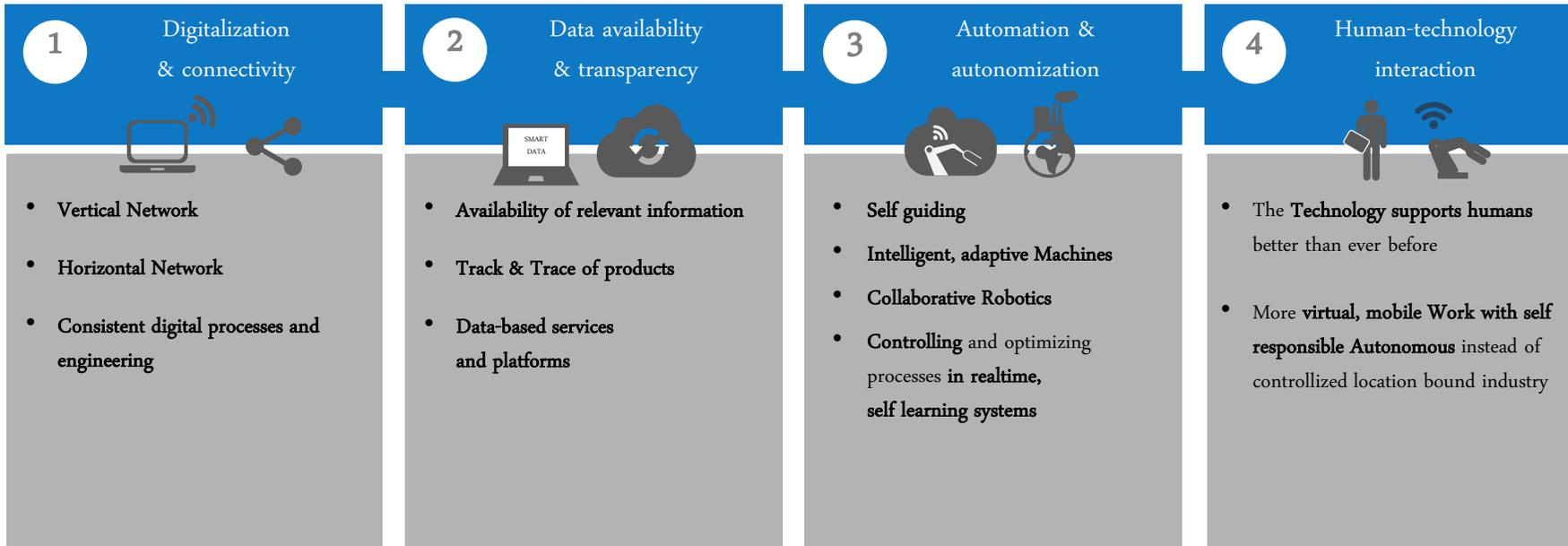
BOSCH — Bosch Connected Devices & Solutions

Lead User

250 Bosch plants world wide

- Manufacturer of products
- Machine operator
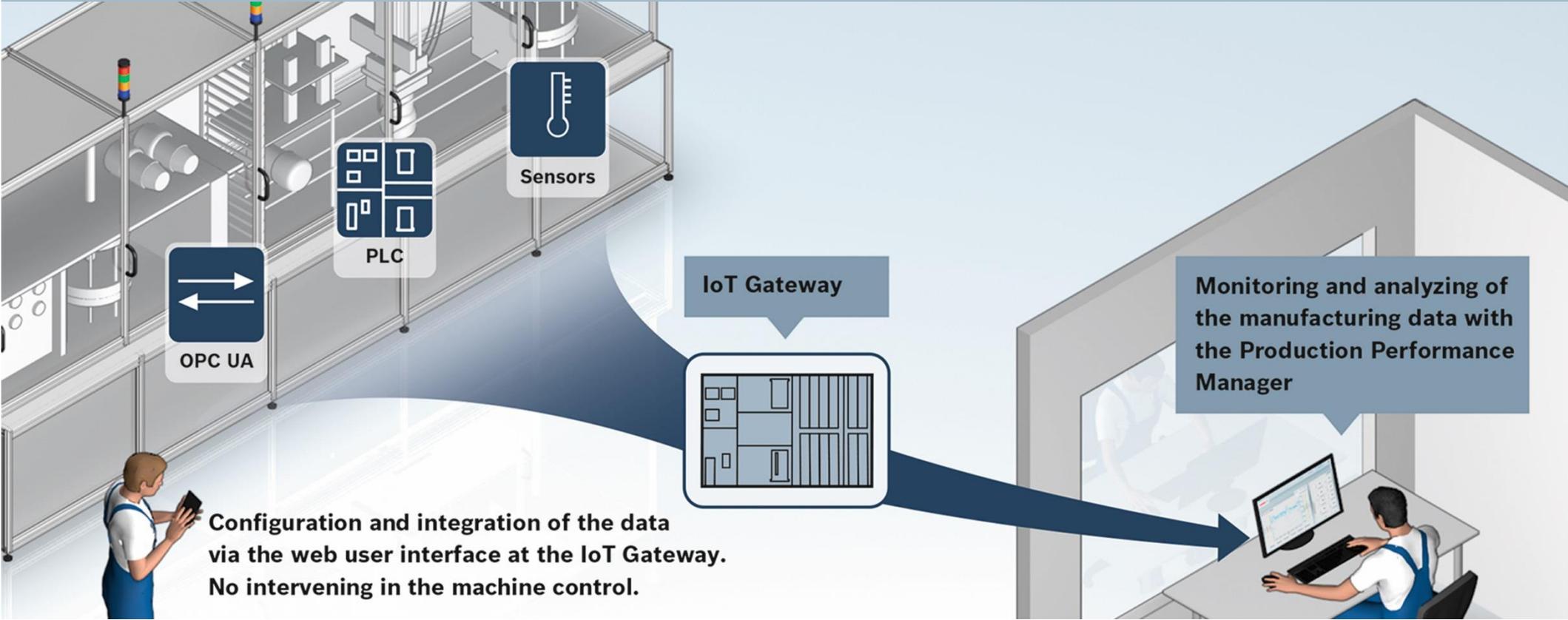- Plant operator
- Interface to customers/suppliers

More than 50 pilot projects for Connected Industry initiated

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What characterizes Industry 4.0?

i 4.0 CONNECTED INDUSTRY

1 Digitalization & connectivity	**2** Data availability & transparency	**3** Automation & autonomization	**4** Human-technology interaction
• Vertical Network • Horizontal Network • Consistent digital processes and engineering	• Availability of relevant information • Track & Trace of products • Data-based services and platforms	• Self guiding • Intelligent, adaptive Machines • Collaborative Robotics • Controlling and optimizing processes in realtime, self learning systems	• The Technology supports humans better than ever before • More virtual, mobile Work with self responsible Autonomous instead of controllized location bound industry

SMART DATA

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For a fast way in to Industry 4.0, start by monitoring and analyzing your manufacturing data

Sensors

PLC

OPC UA

IoT Gateway

Monitoring and analyzing of the manufacturing data with the Production Performance Manager

Configuration and integration of the data via the web user interface at the IoT Gateway. No intervening in the machine control.

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Use Case: IoT Gateway at Bosch Rexroth

Monitoring of lubricants and filters and compliance with the ISO cleanliness level

Maintenance Support System

IO-Link

Bluetooth SMART

CERTIFIED USB

Rexroth IndraControl XM22

-25%
Maintenance costs

-20%
Complexity for manual testing

+5%
OEE

ROI <
1,5 years

| Existing test facility without IT-Connection | + | IoT Gateway | + | Production Performance Manager |
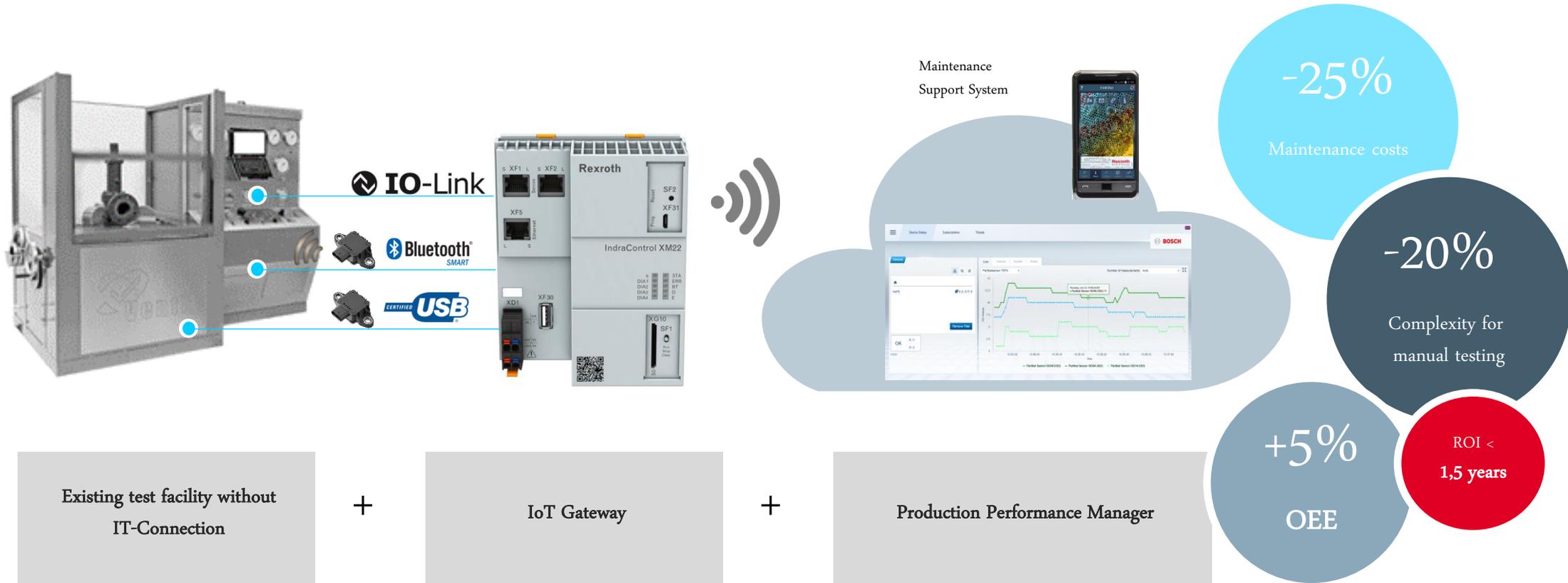
OEE: Overall Equipment Effectiveness

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ActiveAssist – People as key players
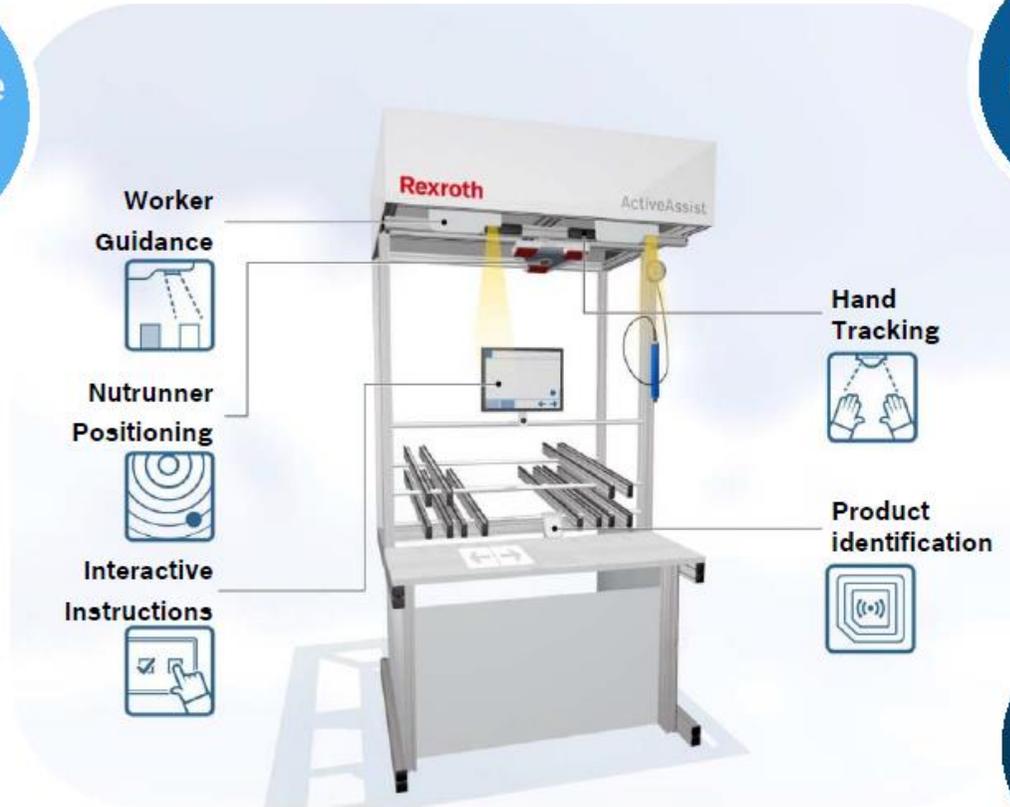
- Assembly steps assistant

  → projected by data projector

  → leaded by pick to light

  → refers Information to the employee (language, know how)

- Assembly step guide

  → tool tracking by ultrasound

  → Hand – detection and –pursuing by 3D camera

  → torque transfer and data feedback via WLAN

- Augmented reality

  → Assembly steps are pictured by data glasses
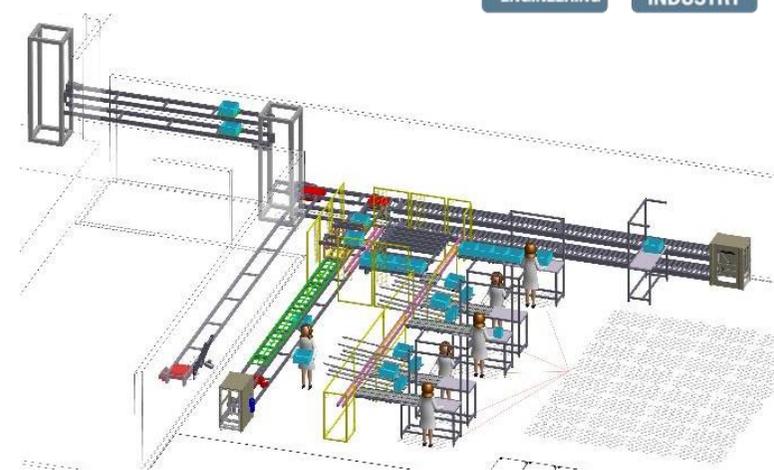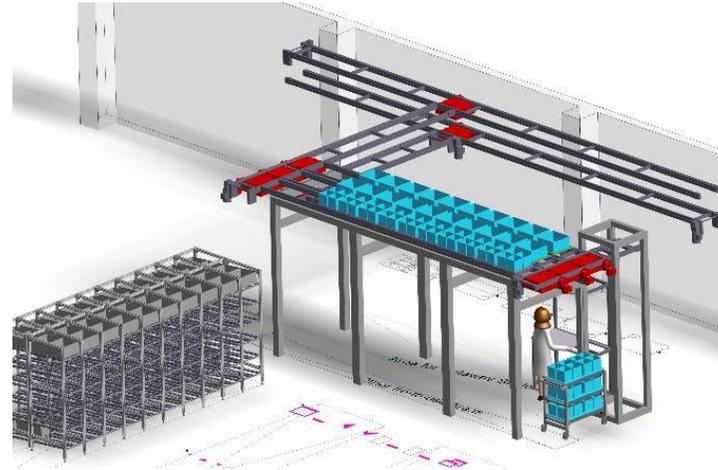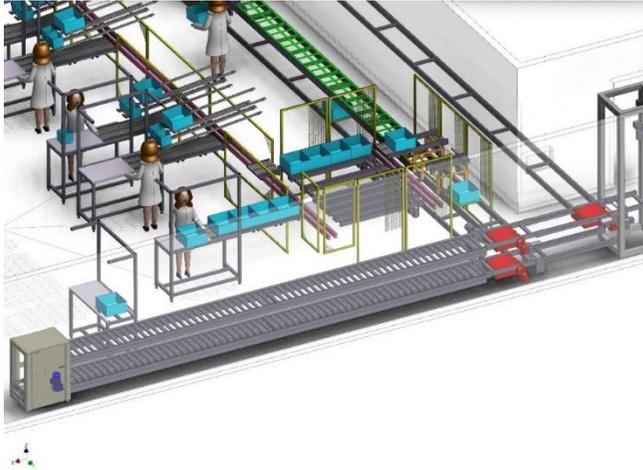
  → virtual buttons

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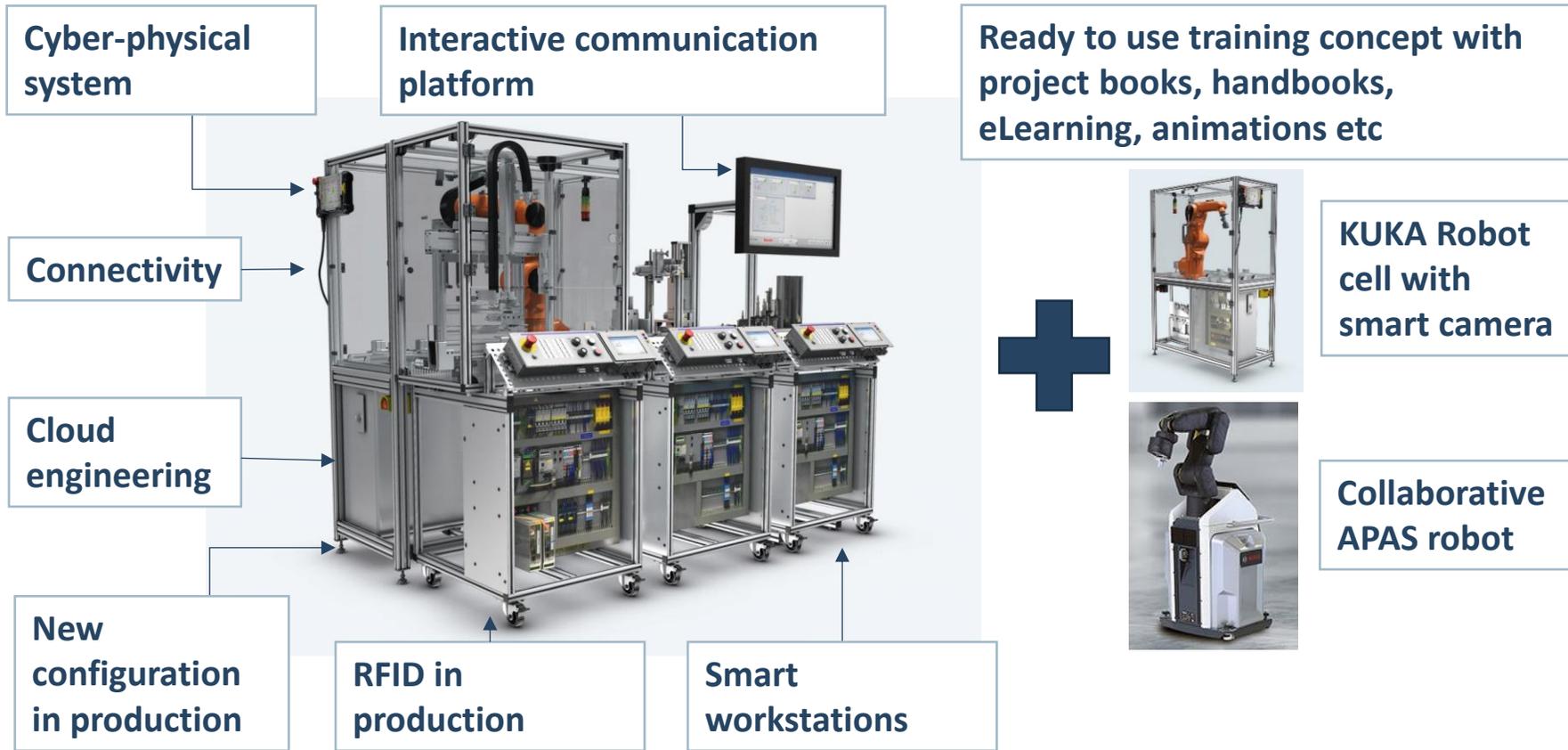## Multi-Product Line at plant Homburg, Germany
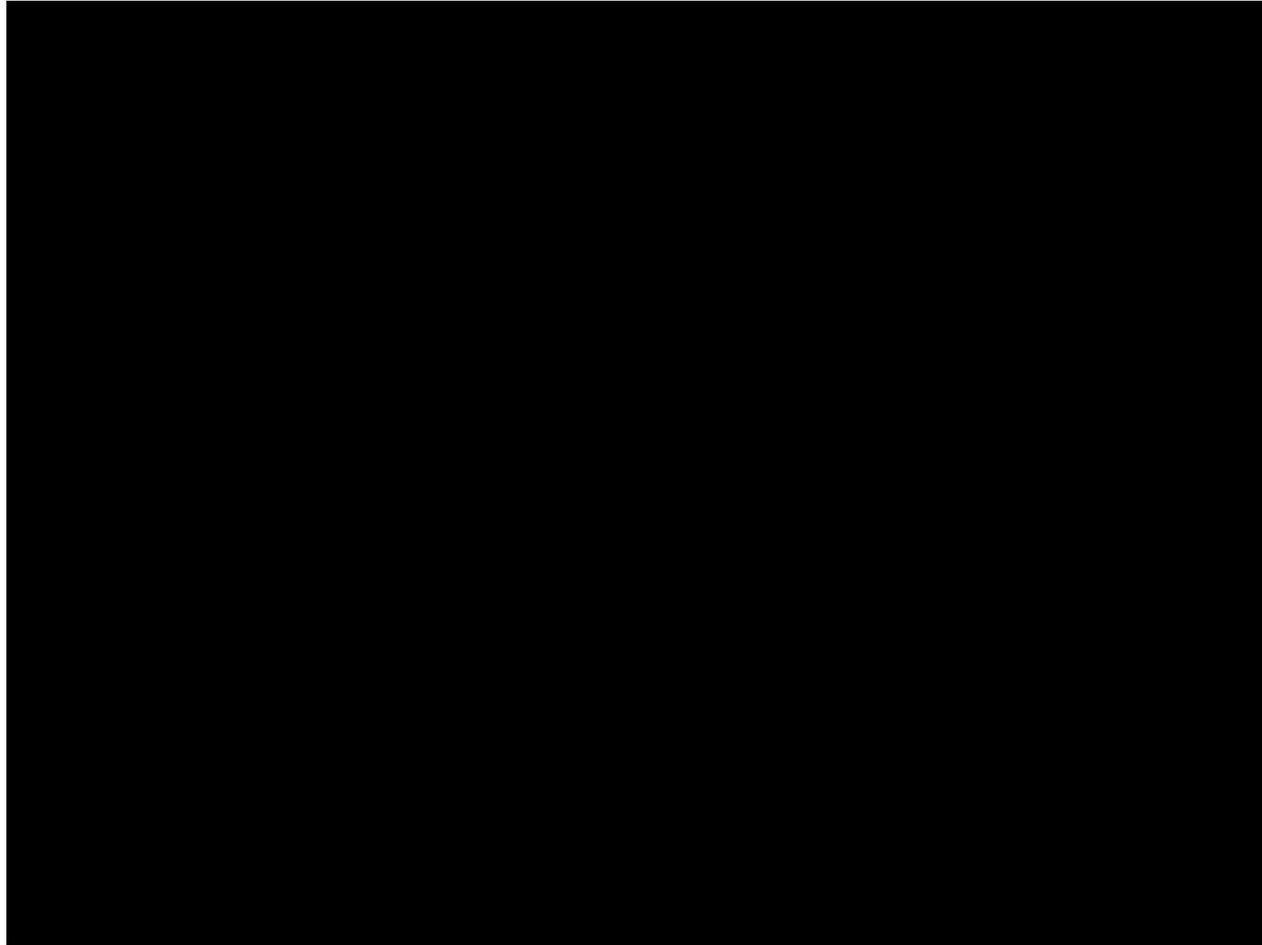
i4.0 consignment stock for SMD parts

- 300m conveyor system with 6 lifting units
- Automatic put-away wagon filling system
- Humanless booking with SAP connection via WebConnector
- RfID bracelet for warehouse operations
- Pick-to-light system for production material flow

mMS4.0 Training System

A whole factory in miniature: understand and learn Industry 4.0

Cyber-physical system

Interactive communication platform

Ready to use training concept with project books, handbooks, eLearning, animations etc

Connectivity

KUKA Robot cell with smart camera

Cloud engineering

Collaborative APAS robot

New configuration in production

RFID in production

Smart workstations

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→Support the people as key player

Industry 4.0 does not have a part number…

→Use data out of connectivity

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Thank you for your attention!

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