

A hand is shown at the bottom of the frame, holding a glowing digital globe. The globe is composed of a network of white lines and dots, with blue 3D shapes representing continents or data points. The background is a blurred industrial setting with blue and white tones.

Digitalisation @ Festo

→ Integrated Strategy – Business – Product - Processes

**“La Voce di chi produce”
Brescia 10 Maggio 2018**

- ❖ Dr. Michael Hoffmeister
- ❖ Alessandro Ferioli

The production of the future is being discussed worldwide

Collaboration of industrial associations, the business sector and politics

it's owl



Logos on the right side of the slide:

- VDI VDE VDI/VDE-Gesellschaft Mess- und Automatisierungstechnik
- SPES XT
- European Union flag
- National IT summit
- Fraunhofer
- DKE VDE DIN
- Trusted Cloud
- Smart Data
- AUTONOMIK FÜR INDUSTRIE 4.0

Logos on the left side of the slide:

- Bundesministerium für Bildung und Forschung
- ProSense
- RES-COM
- smartFactory KL
- PRODUKTIONS ARBEIT 4.0

PLATTFORM INDUSTRIE 4.0

Objectives:

- ❖ Standardization
- ❖ Pilot projects / practical implementation
- ❖ Development of technologies
- ❖ Business and organizational models

Which are the goals of Industry 4.0?

- **Basic-Function: No accidents**
- **No information of and for drivers**
- **Rigid traffic flows**

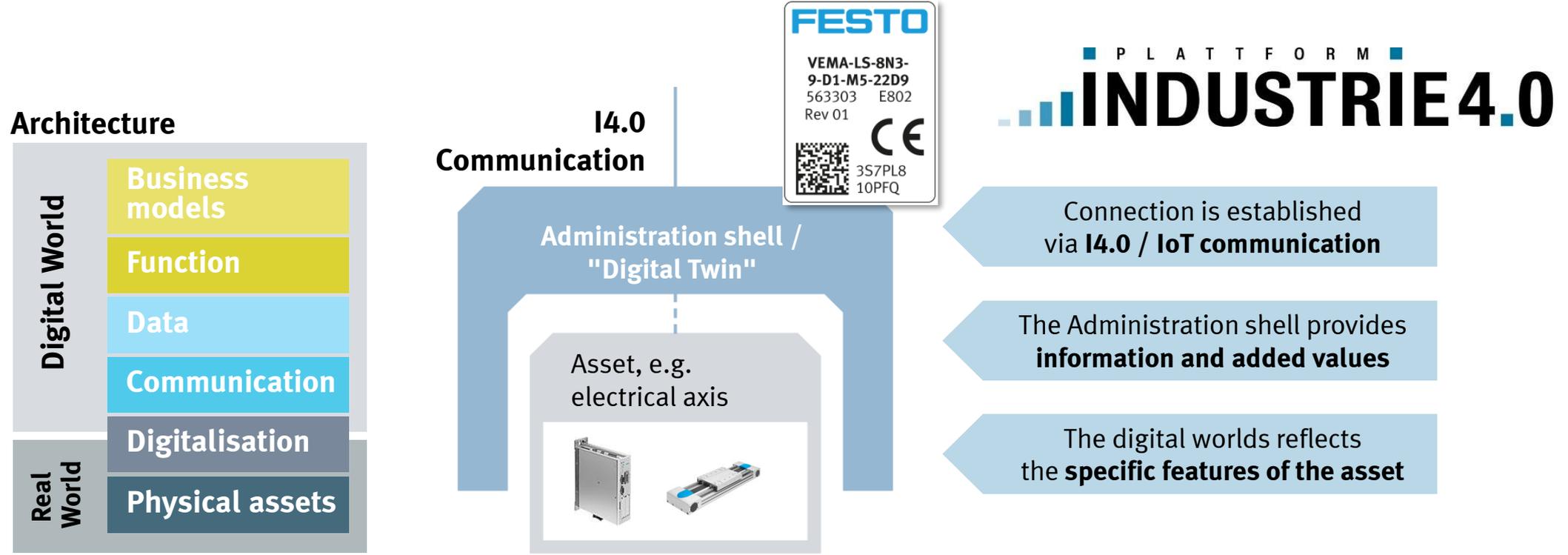


- + Auto**
- + Navigation**
- + Net**

- **Networking: Traffic lights adapt to traffic situation**
- **Adaption: Your car can choose a different route**
- **Energy efficiency: Your car brakes optimally**
- **Business Model: What would you pay for your green wave?**

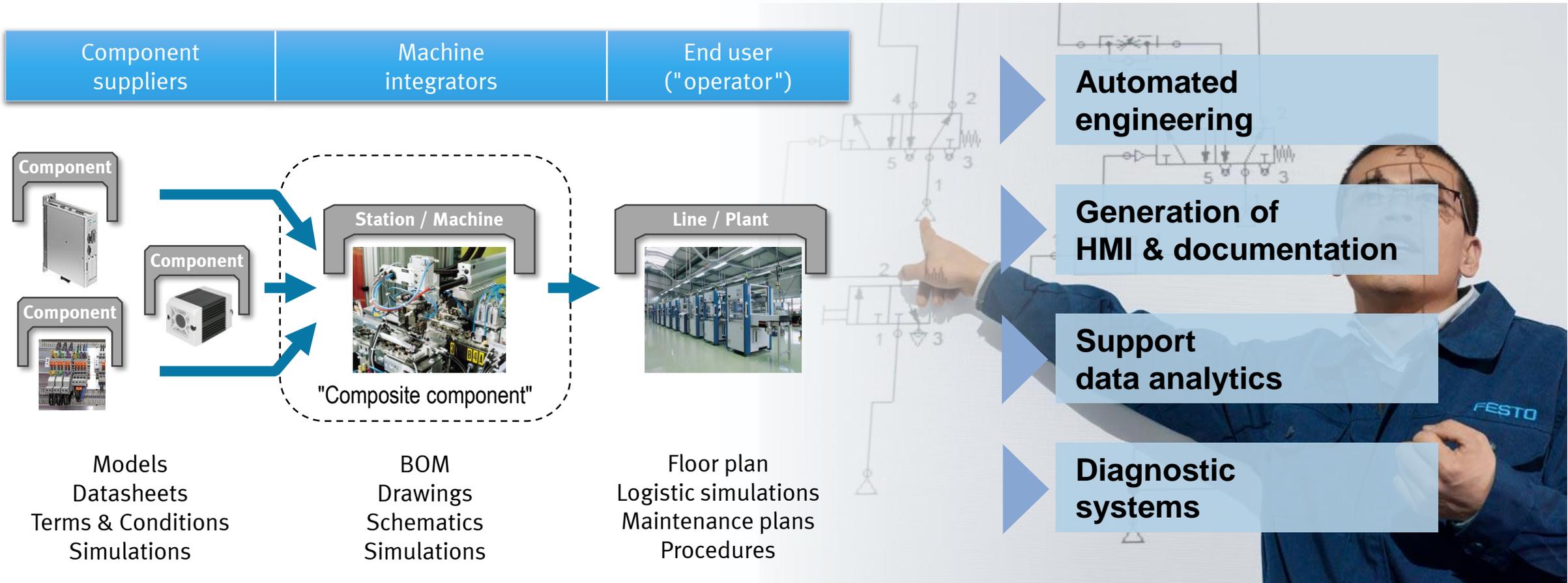
The core concept of Industry 4.0 is the versatile Administration shell

With intelligent and networked components, we are establishing our products in the digital world



All products require an Administration shell to be incorporated into Industrie 4.0

The Administration shell is used for the **entire factory lifecycle** ..
 .. and enables benefits for **engineering and operation**



Current status of Platform Industrie 4.0

International specification of the Administration shell



France / Italy / Germany

International reference architecture for Smart Manufacturing

Joint Working Group 21



China, France, Germany, Italy, Japan, Korea, Sweden, USA, ..

Information exchange by Administration shell

Many different initiatives committed to one unifying information exchange format

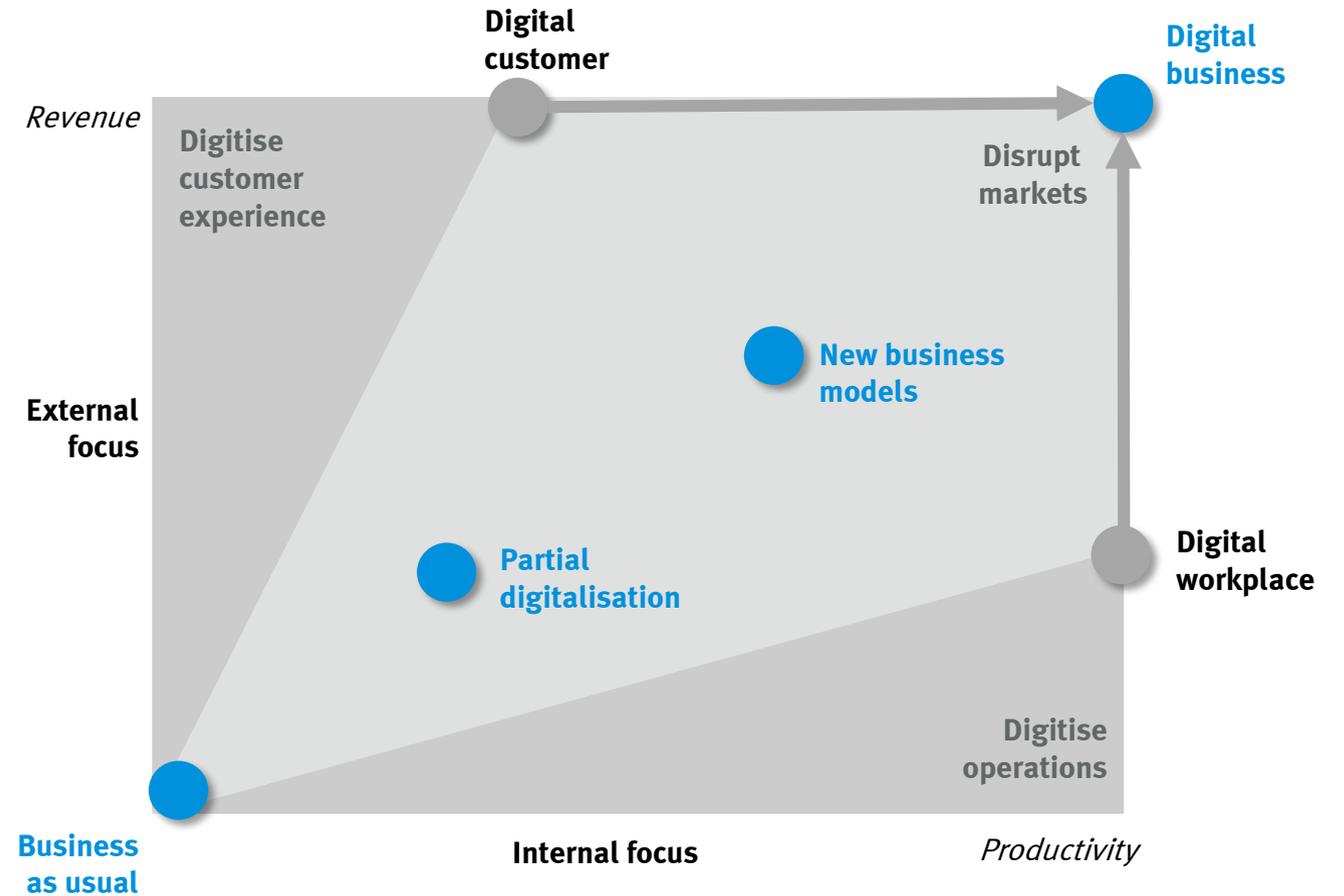


Currently under development

Strategic dimensions and objectives of digitalisation at Festo

Objectives for digitalisation at Festo

- ❖ Increase productivity
- ❖ Sell added value
- ❖ Secure growth
- ❖ Expand innovation leadership



Digitization Program - Overview



DIGITAL OFFERING

CREATE ADDED VALUES FOR OUR CUSTOMERS

SELL DIGITIZATION

DIGITAL TRANSFORMATION

UTILIZING AND LIVING DIGITIZATION WITHIN THE COMPANY

Digitalization Program - Overview



Smart Products



Smart Services



Digital Customer Journey



Industry 4.0 in our own value chain

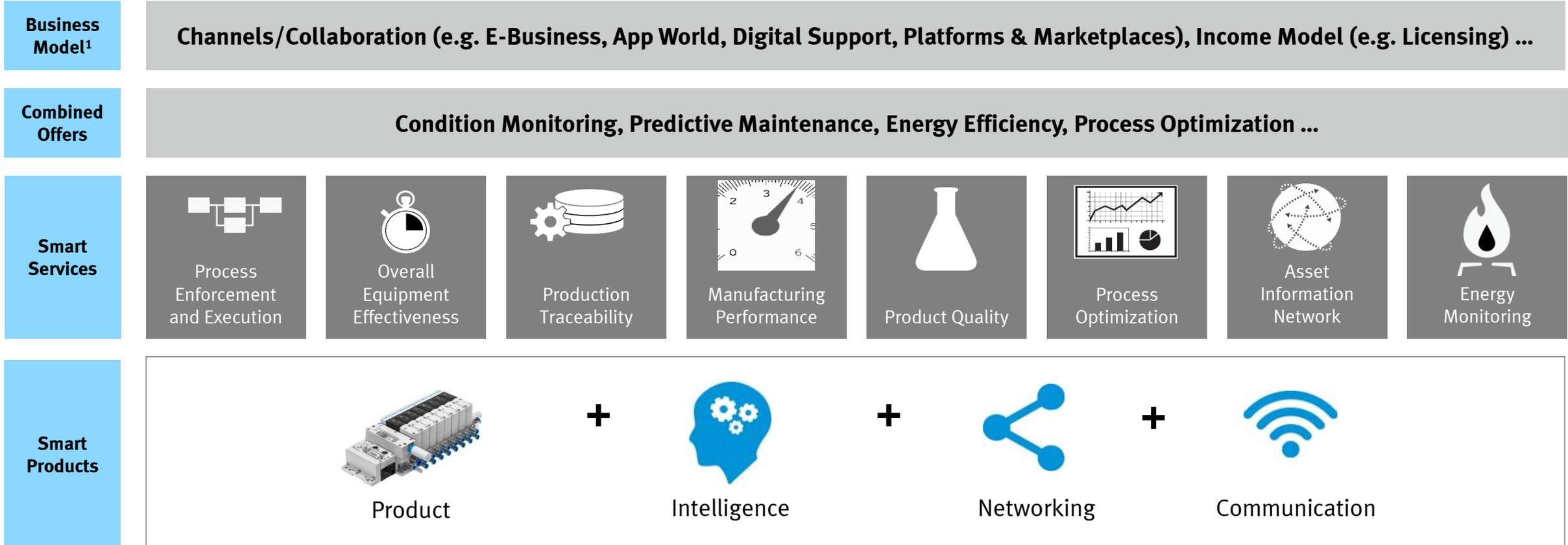


Working environment and Qualification



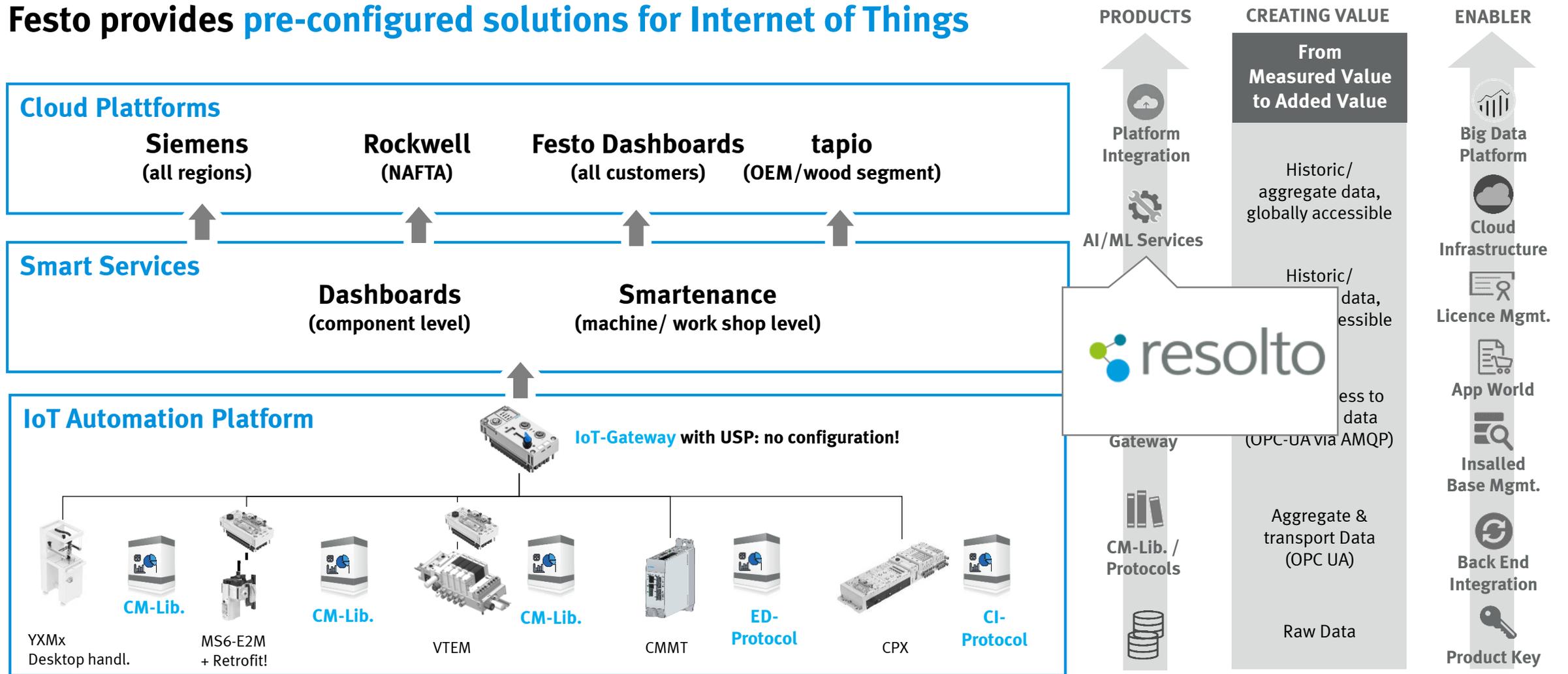
Culture and Mindset

Definition of Digital Products



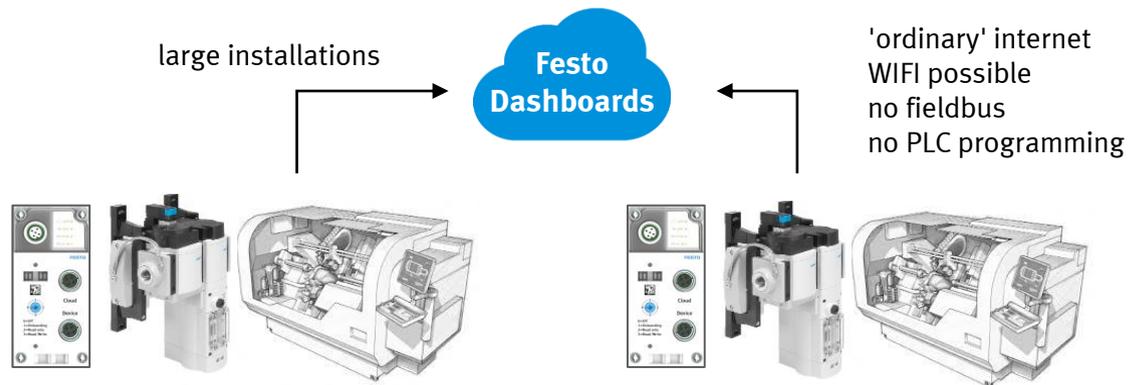
¹ changes to existing business model might apply

Festo provides pre-configured solutions for Internet of Things



Applications | 2 of many

Retrofit existing shopfloors



- Retrofit existing shop floor, e.g. machine tools
- 10, 20, 30, .. machines
- multiple halls, different sites, ..
- monitor energy consumption, check for leakage trends
- collect data for certificates (CO2) and reports
- analyse unusual events, usage, occupation
- 99 users, 1 year of data retention

IoTize conventional assembly machine



- compatible with existing ethernet fieldbusses (PN, EIP, ..)
- compatible with existing controls, no programming!
- monitor condition counters -> maintain w/o production break
- error diagnosis of CPX with clear-text messages
- error-log possible
- monitor field bus status, shifts per day, ..
- OEE, productivity up to 1 year

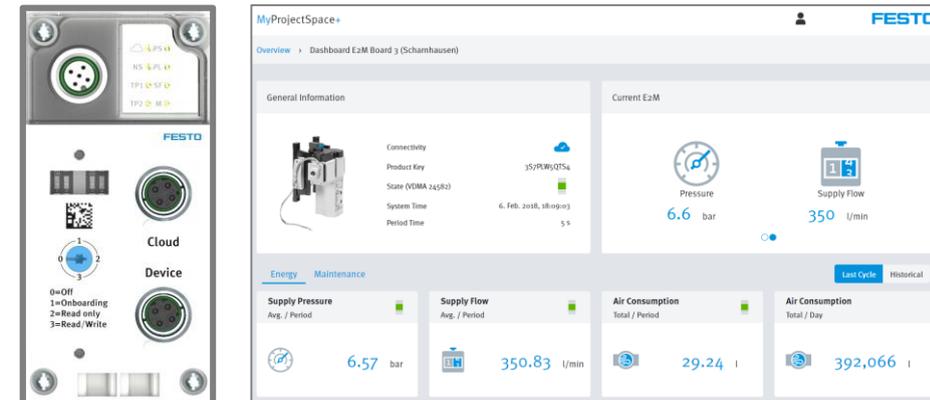
Competition and USPs

Google "industrial iot gateway" gives 591.000 hits ..

Each of these must be administered in the network and extensively configured!



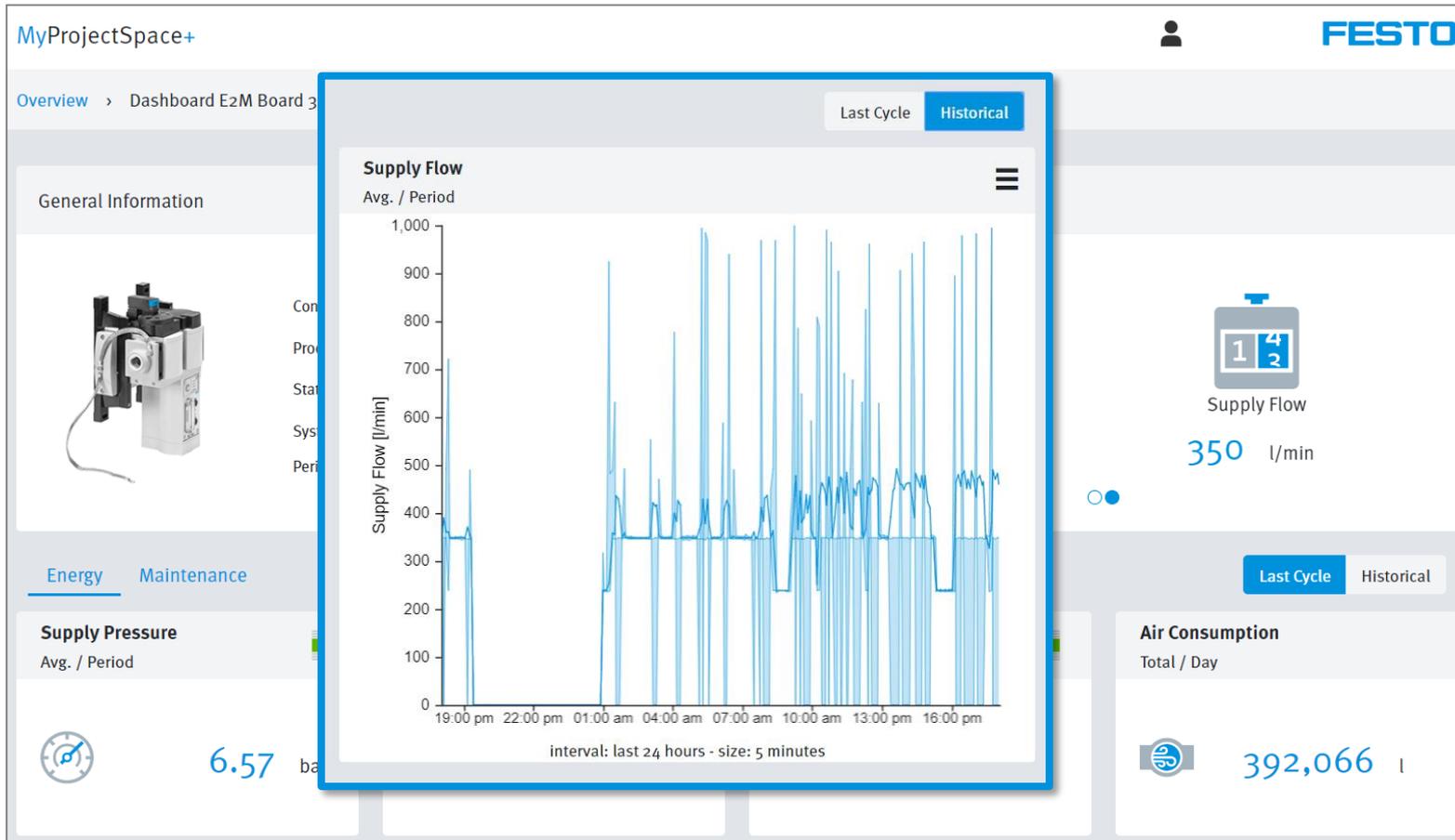
Source: Aventics, janz, Bosch Rexorth, Hilscher, IBM



USPs of Festo approach:

- hardware switch addresses security awareness
- automatically paired with selected Festo clouds (patent pending)
- pre-configured dashboards (no expert knowledge required)
- simple business model (dashboard licenses)

Festo Dashboards - Pre-configured turn key solutions for our customers' Top 3 daily use cases

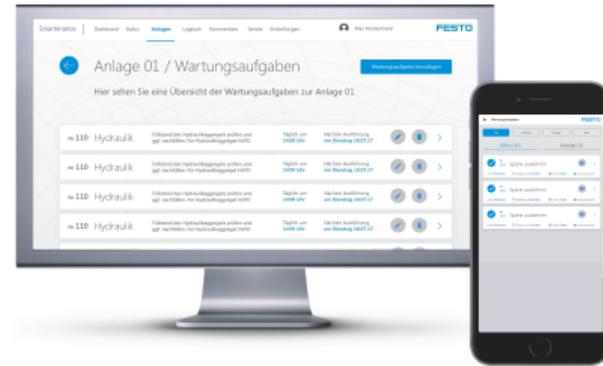


Industry standard VDMA 24582 for condition monitoring

- ▶ Dashboards **pre-configured** for each Festo device
- ▶ Further **customization** possible
- ▶ **Specific widgets and charts** for the Top 3 use cases:
 - ▶ Energy monitoring
 - ▶ (Preventive) maintenance
 - ▶ Process KPIs & OEE
- ▶ Access to historical data (up to 1 year!)

Smartenance – Good indications for Festo digital tools suitable on a plant-wide level

Time consuming paper&pen → digital maintenance manager



Easy operation

by clear structure and control surface

More safety

by peer-reviewing of plant operator and production controller

Faster process

by mobile, digital apps

Features & Benefits

1. Mobile, digital maintenance instructions



2. Reminders and feedback of preventive maintenance tasks

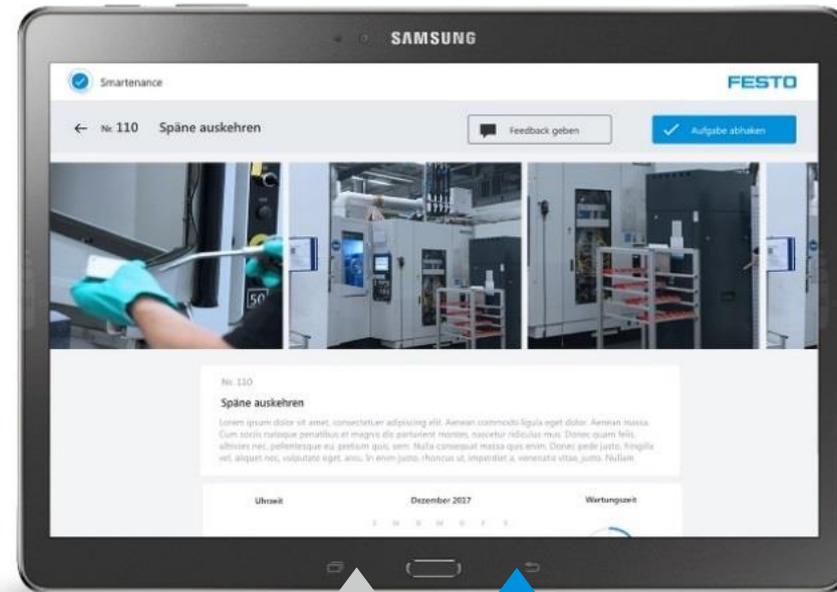


3. Centralized evaluation of preventive maintenance tasks



What will make **Smartenance** unique in this market?

For Q2/2018 (HMI):
Pilot version publically
available in App World



- ❖ Large customers do often have plant-wide maintenance solutions with SAP ..
- ❖ **Small customers** today do maintenance manually or with simple applications

Smartenance can be used for
any machine and **any component**

For Festo components:

- pre-configured maintenance plans
- on-line warnings from dashboards

Different cloud platforms for different needs



Customers, who:

- want earn immediate benefits
- have mechanical/ fluidic/ simple-use focus
- are smaller customers, Festo as system partner
- use many different control systems

Start CW42'18



Customers, who:

- are large OEMs or endusers
- want to network many different IoT components
- already have Siemens lock-in

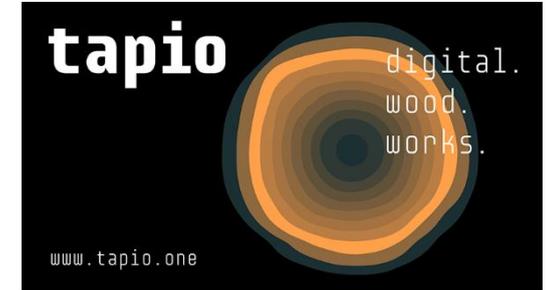
Start End '18/ Beg '19



Customers, who:

- have NAFTA focus
- deny possibility of a cloud (Rockwell solution is edge-based)

Piloting single dashboards



Customers, who:

- have a wood-industry focus

Proofs of concepts

Digitalization Program - Overview



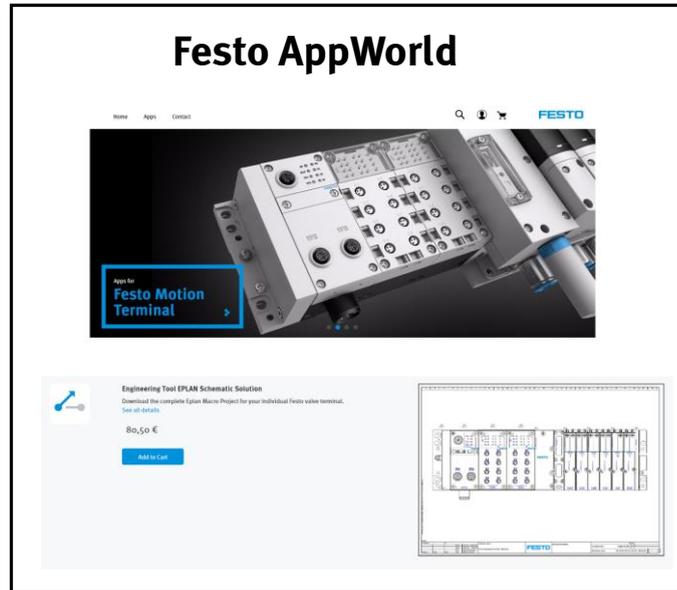
Digital Customer Journey - Intuitive digital support of customers for all customer touchpoints



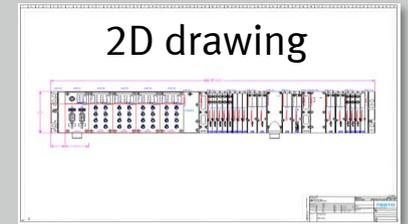
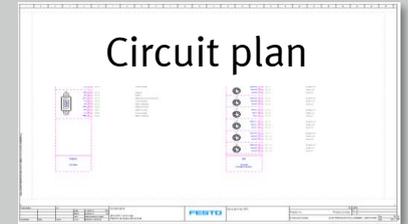
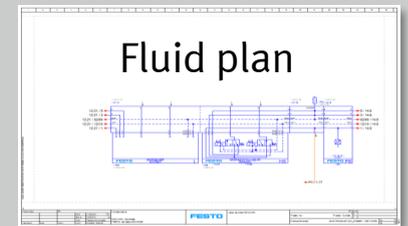
Automatic generation of electric and fluidic schematics via Festo App World

- High saving potential by automated plan generation

IC1: 50E-F06GCQPERERERER-D+HBABE
 IC2: 32P-SGL-R-MAHAHBHLBHIIIUPEBHAH
 -5J3LJLHS5JL+6TJ



ZW1 & PDF File

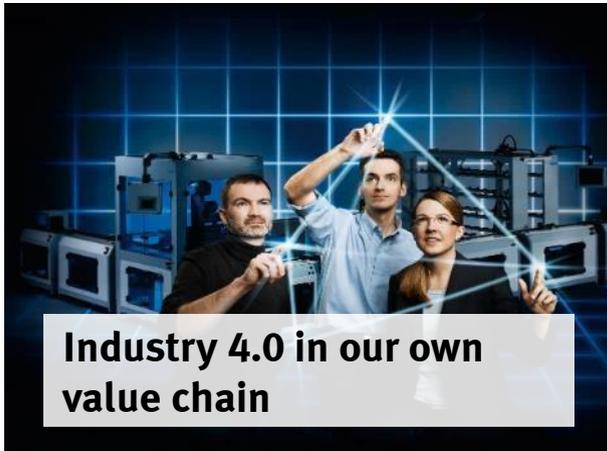


No manual steps for Festo components

- ➔ Just a few **minutes** runtime
- ➔ Improved fail safety



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DIGITAL TRANSFORMATION

UTILIZING AND LIVING DIGITIZATION WITHIN THE COMPANY

Digitalisation needs new **skills, competences and culture** within the organisation

Cooperation and alignment are essential to interlink „Digitization“ within the company

Operations

Digitization and Industry 4.0 in the value chain



Human Resources

New working areas, methods and environment



IT department



Cloud Readiness— hybrid & scalable

- Build up suitable infrastructure and processes
- IT Security
- Big Data & Analytics platform
- Installed Base Management
- License management
- Backend Service Integration

Didactic

Qualification 4.0



Rendiamo sostenibile il futuro: Smart Factory 4.0



Automatizzato e flessibile

Flusso produttivo flessibile

Ottimizzazione energetica

Learning “taken for granted!”



Riduzione costi, lotto adeguato alla domanda



Flusso di info e materiali continuamente ottimizzato

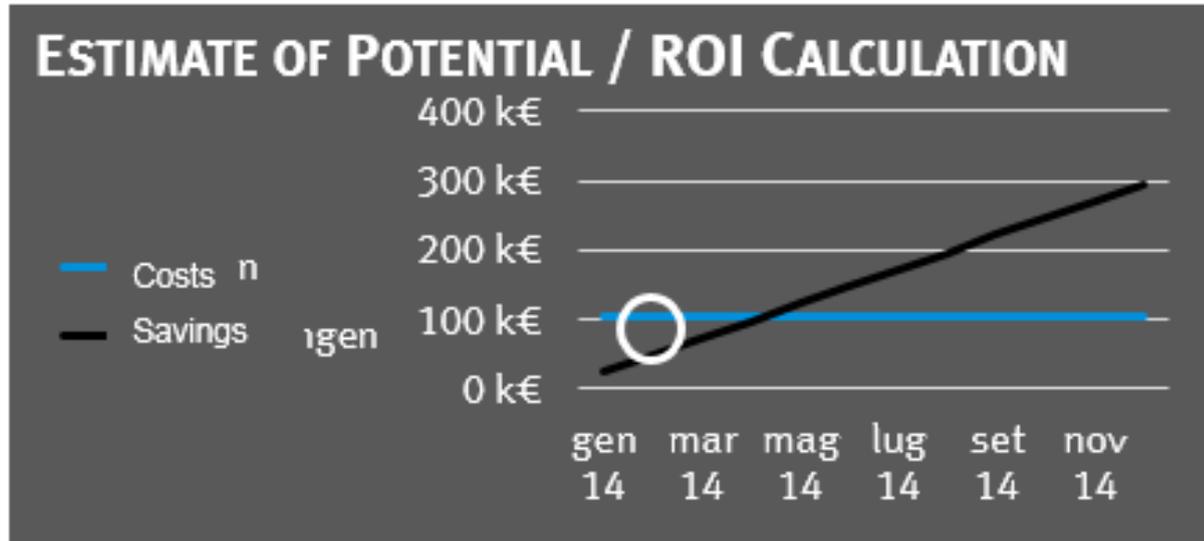


Edifici in Energy Network e efficienza in produzione



Continuo training on the job e Learning centre in loco

Mobile Maintenance



SUMMARY

- ROI of 4,3 months
- about 190.000 € saving in Scharnhausen and Rohrbach in the first year
- High worker's acceptance of the solution
- Further positive effect: Machine linkage leads to higher availability of production

BUSINESS CASE

- 10 Mins Time saving per notification resp. maintenance
- Year 2014: about 19.000 incidents, 2.000 maintenances
- Leads to time saving of about 3.500 hours for person (two man years) & machine
- According to labor costs & machine hour rates this results in a saving of
- iPads: 46 devices, total 23.400 €
- Cases: 3.500 €
- Licenses: 79.000 €
- Total Invest:

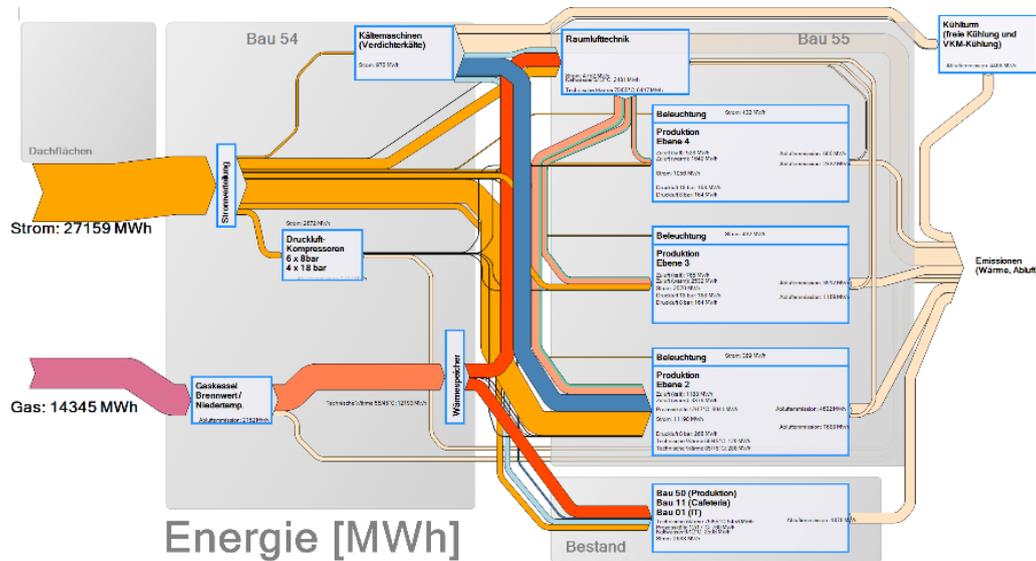
+ 295.000 € *

+ ca. 190.000 € p. a.

- 105.900 €

* Without positive effects of machine linkage

Energy Strategy



1. Bottle-neck optimized work flow

(a chain is only as strong as its weakest part)

- adjust machine performance according to bottle neck situation
- Avoid buffer stocks, one-piece-flow
- Reduce waste of energy

2. Energy Peak management

- Avoid energy peaks
- start critical machines at different times
- reduces energy (electricity) bill by 1/3

3. Utilise available energy sources better

- pre-heat galvanic baths are by “waste” energy of other machines/compressors
- optimize these sequences in general, and daily depending on work-load

Results 2016/2017

1 GW
less energy

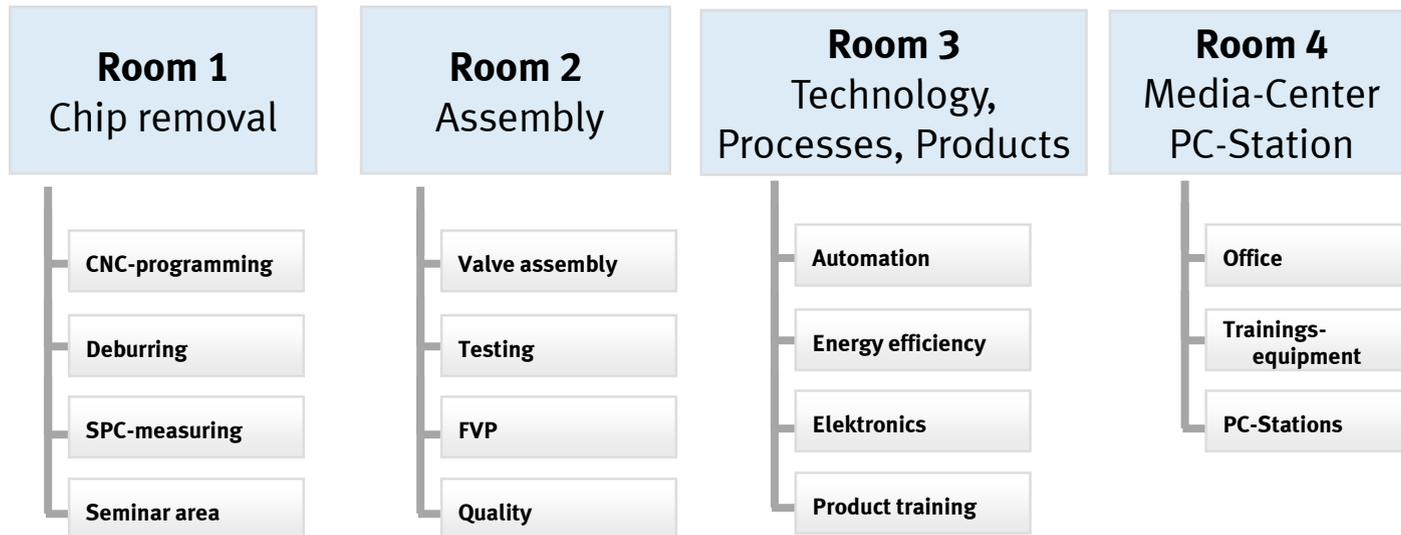
100.000 €
venting and
light intensity

80.000 €
lower pressure

Learning Factory



220 m²

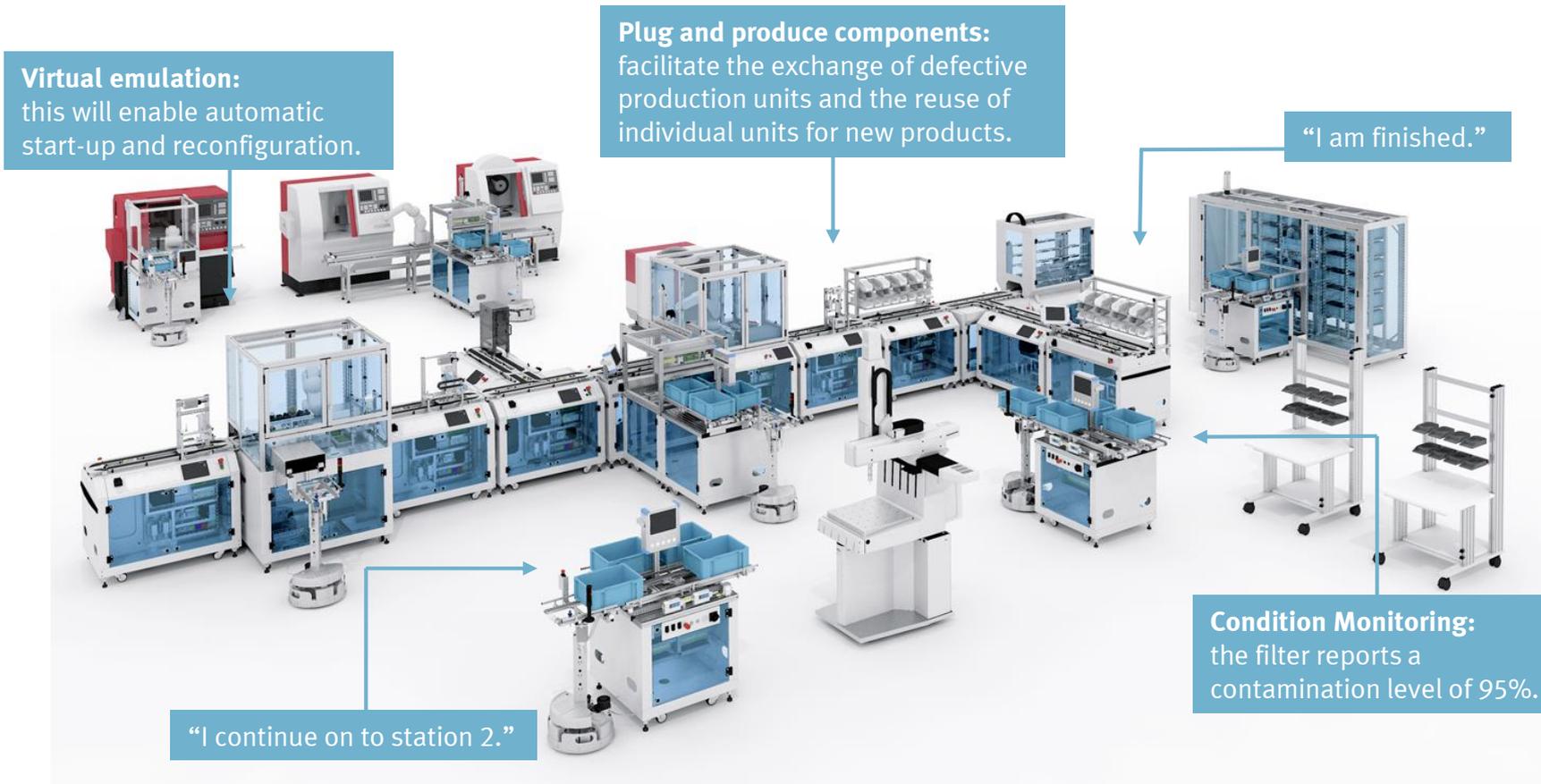


Attività
operative
selezionate

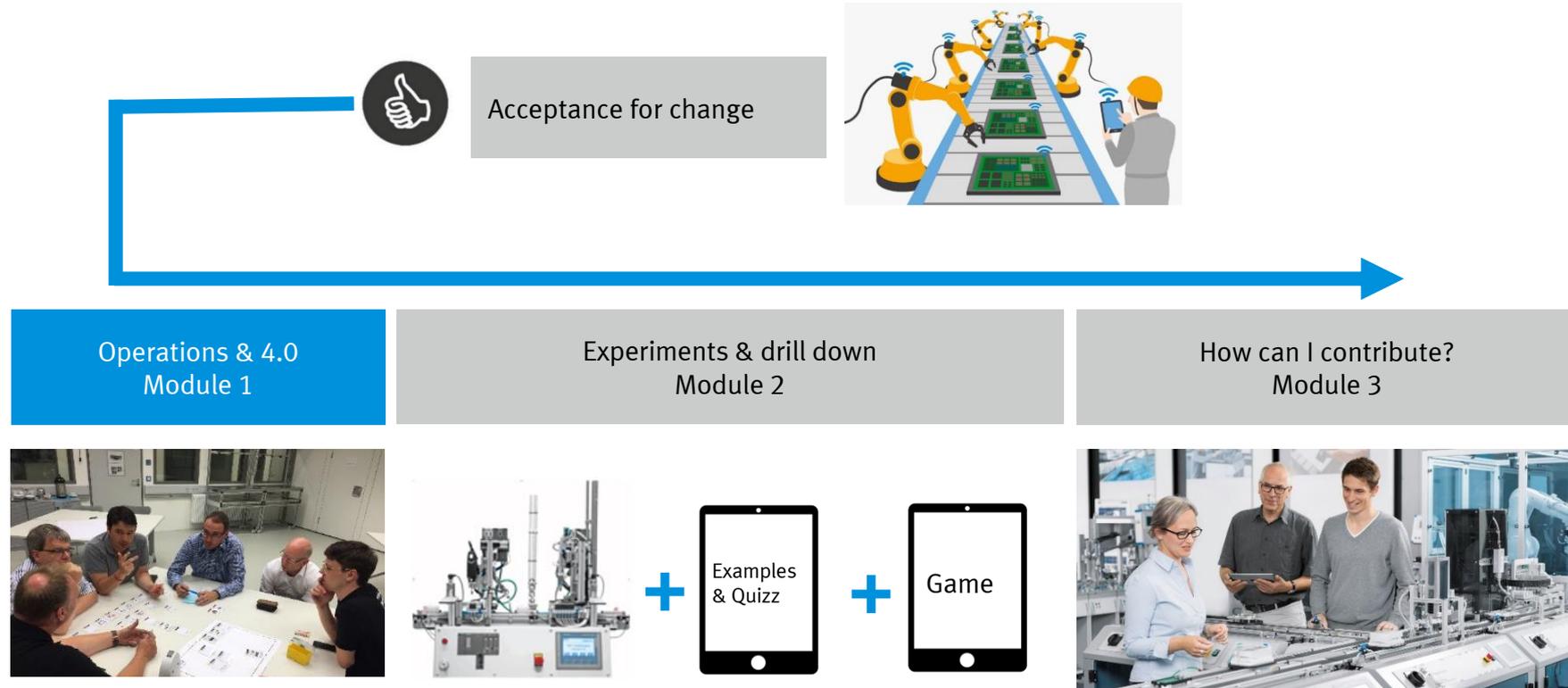


Training
Package
dedicati

Cyber Physical Factory for training and Education



Players 4.0 - Benefits



Besides of technical qualification ...

MINDSET & CULTURE



WAY OF WORKING & WORKING SPACES

**MOVEMENT AND INNOVATION
OF EMPLOYEES!**



capable of making decisions



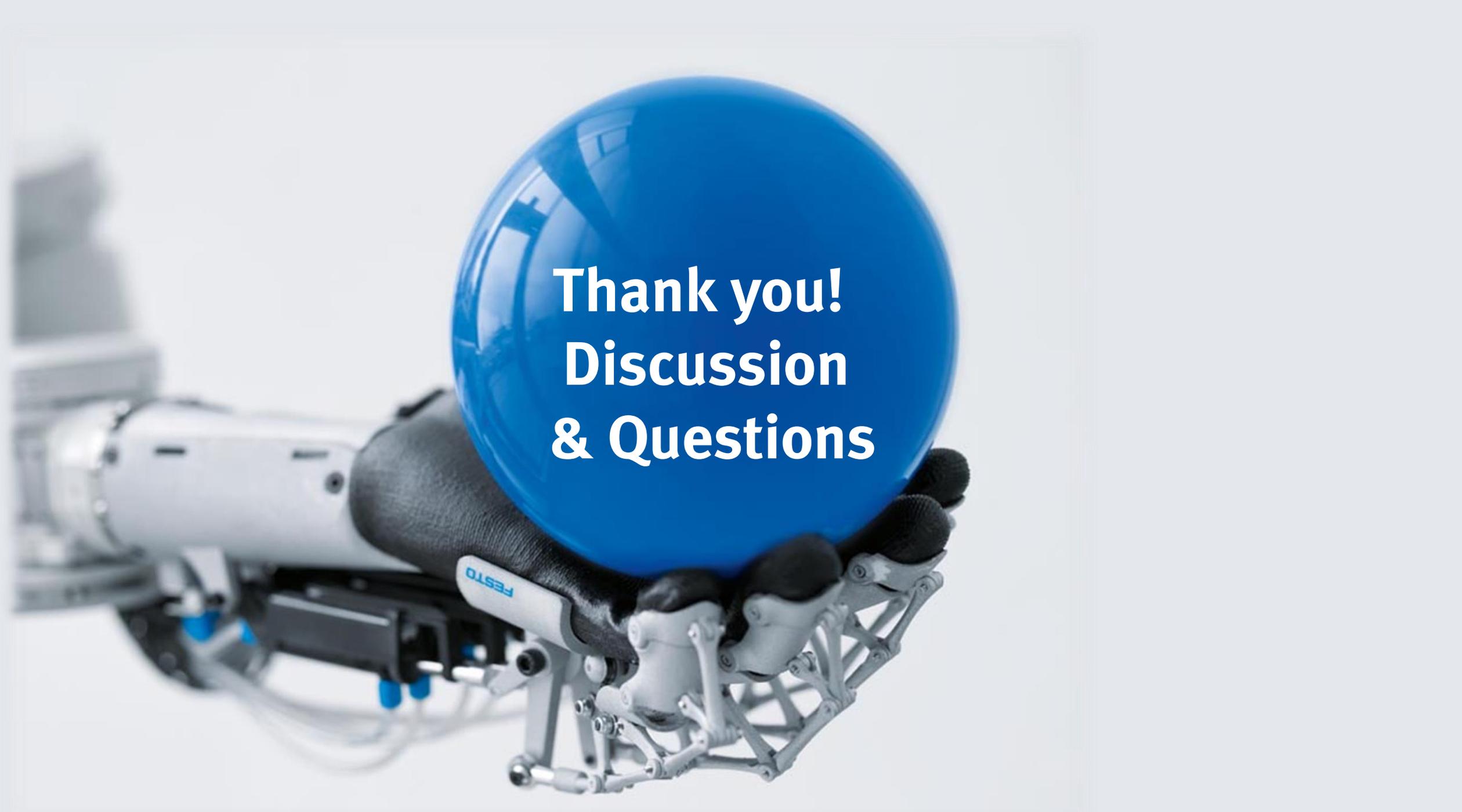
creative & innovative



interdisciplinary



Agile: speed & iterative

A close-up photograph of a white and black robotic hand, specifically a Shadow Hand, holding a large, glossy blue sphere. The sphere is the central focus and contains white text. The background is a plain, light-colored surface.

**Thank you!
Discussion
& Questions**