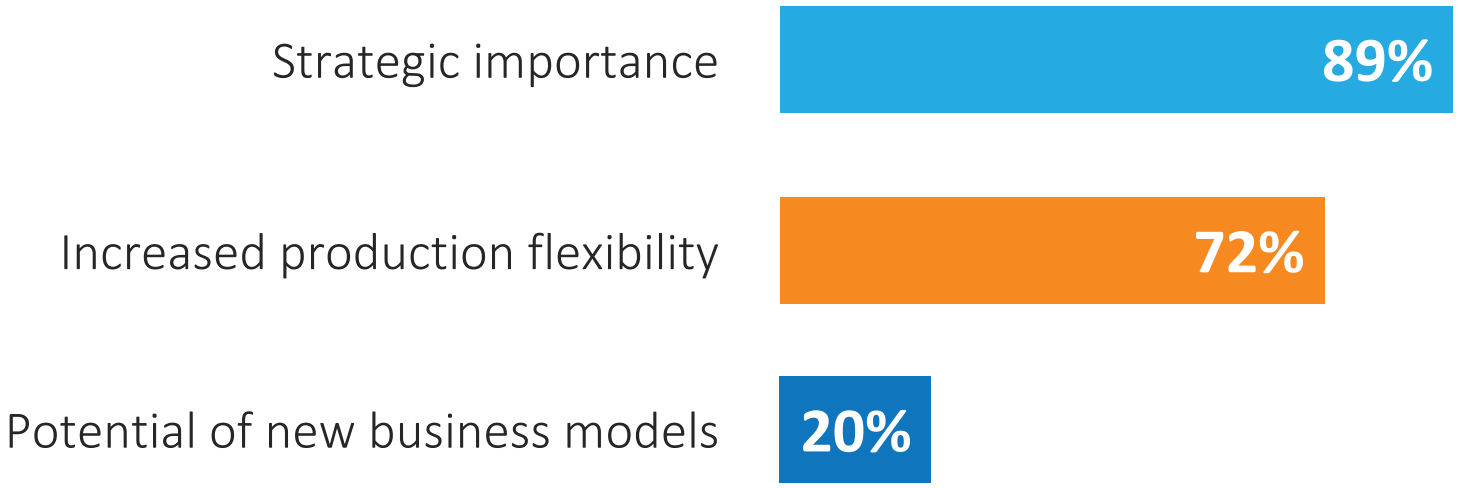
Labs Network Industrie 4.0 e.V.

Industry 4.0 Use Cases and Testbeds with SME in Manufacturing and Service

June 7th 2018

Opportunities for SMEs



Sources: bitkom; Industrie 4.0: Status Quo und Perspektiven 2017 (only available in German; English translation: Industry 4.0: Status Quo and Outlook 2017)

Plattform Industrie 4.0 in Germany

The digital transformation needs a broad-based foundation

Plattform Industrie 4.0 in Germany

Working groups

PLATTFORM INDUSTRIE 4.0

- 400 participants
- Relevant stakeholders in Germany

Representatives from business, trade union, academia, political integration

- WG1: Reference architectures, standards and norms
- WG2: Technology and application scenarios
- WG3: Security of networked systems
- WG4: Legal framework
- WG5: Work, education and training
- WG6: Digital business models in Industrie 4.0

Plattform Industrie 4.0

International cooperations

Digitising European Industry

Kooperation China

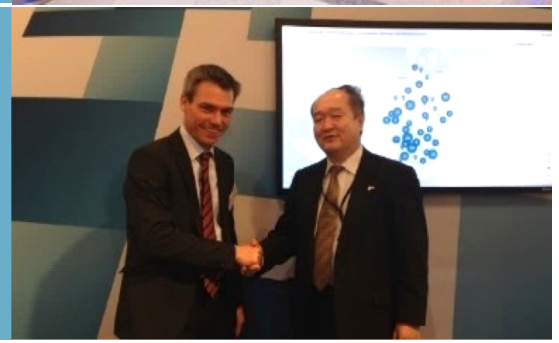
Alliance Industrie du Futur France

PianoIndustria4 Italy

Industrial Internet Consortium (IIC)

Referenzarchitekturen angleichen für mehr Interoperabilität

Robot Revolution Initiative Japan



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Source: Plattform Industrie 4.0

LNI4.0 founders, Nov. 2015

Our network feels connected to the entire German industry!

Dr. Klaus Mittelbach
Treasurer

Thomas Hahn
Chairman

Dr. Christian Schläger
Vice Chairman

Hartmut Rauen

Dr. Hans Jörg Stotz

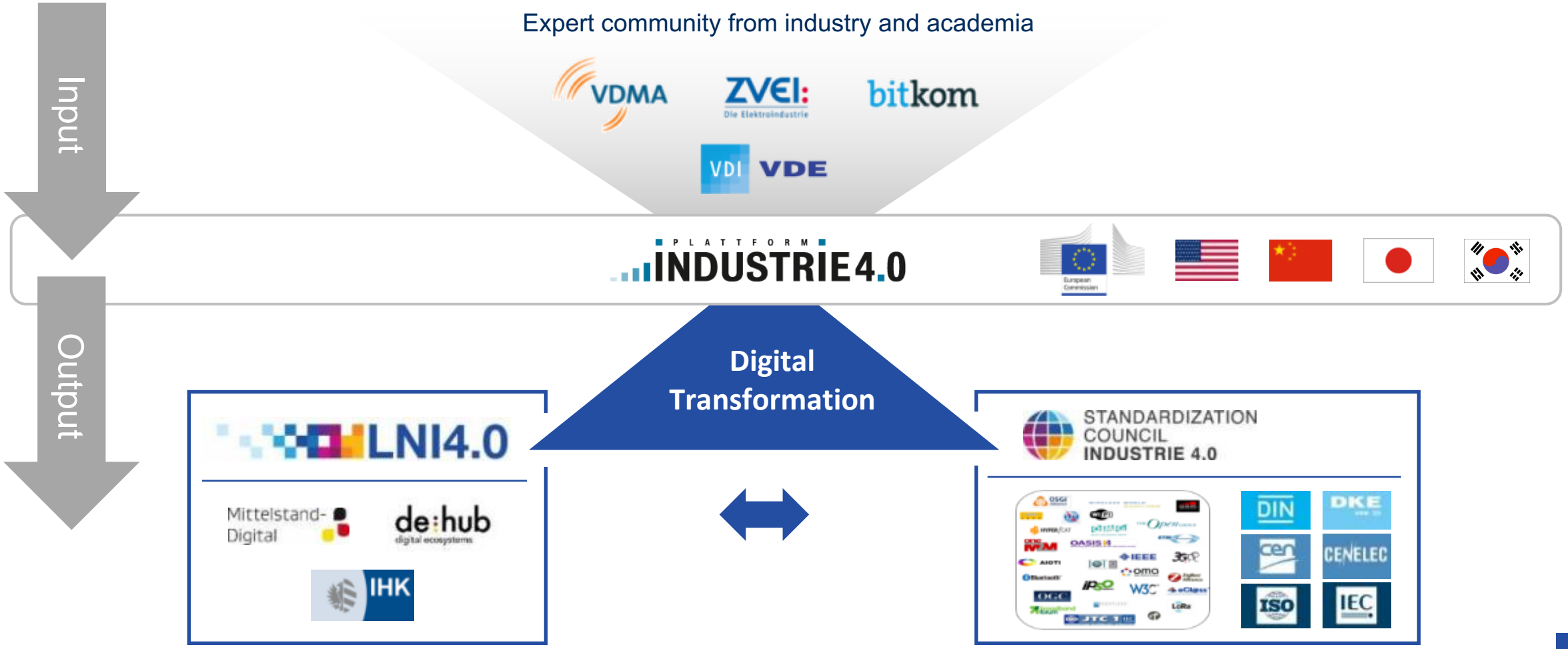
Prof. Dr. Peter Post

Sven Zehl

Dr. Heinrich Arnold

In cooperation with:

Industrie 4.0 Stakeholders



Testlabs cooperation (>40 MoU)

LNI4.0 LABS NETWORK INDUSTRIE 4.0

BMWi Kompetenzzentren 4.0

- Mittelstand-Digital
- Mittelstand 4.0 Kompetenzzentrum Augsburg
- Technische Universität Braunschweig
- DIGITAL IN NRW
- FIR InnovationLabs
- UNIVERSITÄT MAGDEBURG
- smartFactory
- DEMOFABRIK AACHEN
- SmartFactoryOWL
- HESSEN DIGITAL
- Leibniz Universität Hannover
- mit uns digital!
- Fraunhofer IGCV
- Fraunhofer IPA
- Fraunhofer AISEC
- Fraunhofer ESK
- Smart Automation Lab
- TECHNISCHE UNIVERSITÄT CHEMNITZ
- CiP

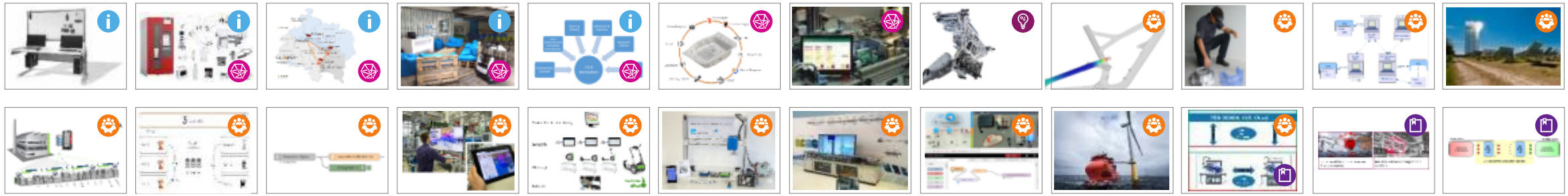
DIGITAL HUBS

- unternehmertum TUM
- de:hub digital ecosystems

INDUSTRIE 4.0 TESTLABS

- FH MÜNSTER University of Applied Sciences
- INDUSTRY BUSINESS NETWORK 4.0
- iisys Institut für Informationssysteme der Hochschule Hof
- VIRTUAL DIMENSION CENTER
- ARENA2036
- TH WILDAU
- IHK
- TECHCENTER
- Lufthansa Industry Solutions
- CETECOM
- DHBW
- HTW Hochschule für Technik und Wirtschaft Dresden
- FZI
- SCHMERSAL
- FAU FRIEDRICH-ALEXANDER UNIVERSITÄT ERLANGEN-NÜRNBERG
- Microsoft
- tec.nicum excellence in safety
- Smart Data Innovation Lab
- TWENTY54LABS
- evosoft
- SAP Co-Innovation Lab
- UniTransferKlinik Lübeck
- HSD
- Universität Potsdam
- Smart Electronic Factory
- UNIKASSEL VERSITÄT
- Fraunhofer IOSB

>60 Use Cases with >60 SME



AI FOR FERRIES (HVAC)

HVAC OPTIMIZATION WITH ARTIFICIAL INTELLIGENCE

FACILITATE TEST SCENARIOS

- 10% energy cost savings by AI
- Classical HVAC control technology is replaced by AI, prediction and parameter optimization (on-site or cloud)

PROEKSPERT

Rheinhold & Mahla
Since 1887

CONTROLLER 4.0

SENSOR SUPPORTED ASSIST SYSTEMS

FACILITATE TEST SCENARIOS

- Assist systems based on sensors and AI to increase energy efficiency and optimize process operation
- Predicative maintenance based on operational data and smart services

Technische Universität Braunschweig

CarboFibretec IDEAS OF TOMORROW

TRINAMIC MOTION CONTROL

COMPOSITES 4.0

SMART STRUCTURES

LNI4.0 LABS NETWORK INDUSTRIE 4.0

ARRANGE ACCESS TO APPROPRIATE TESTLABS

- Smart asset as new business model
- Condition monitoring over the entire lifecycle
- Structure, sensors and wireless technologies embedded

ARENA2036 BOSCH DAIMLER Hochschule Ravensburg-Weingarten Technik | Wirtschaft | Sozialwesen SWINBURNE UNIVERSITY OF TECHNOLOGY Universität Stuttgart

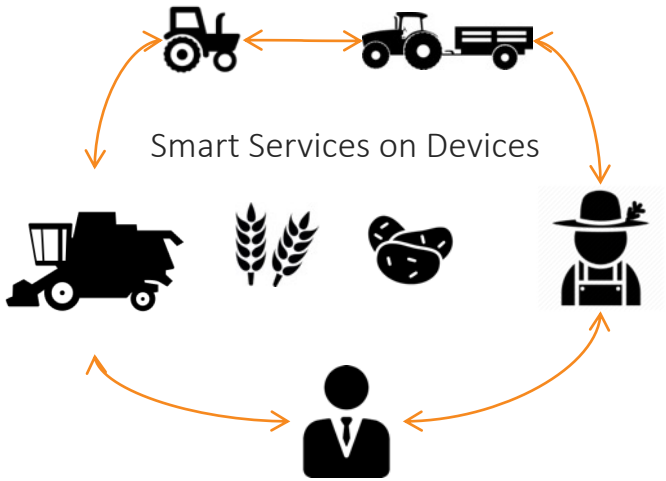
AI IN PRODUCTION

SENSOR-AIDED ASSISTANCE SYSTEMS

LNI4.0 LABS NETWORK INDUSTRIE 4.0

FACILITATE TEST SCENARIOS

- Forecasts optimize crop yields and production costs
- Smart services on production machines
- Local implementation of AI methods without constant cloud connection



Deutsches Forschungszentrum für Künstliche Intelligenz GmbH

RWTH AACHEN UNIVERSITY

LOGIC WAY Logic Way GmbH

GRIMME

CLAAS

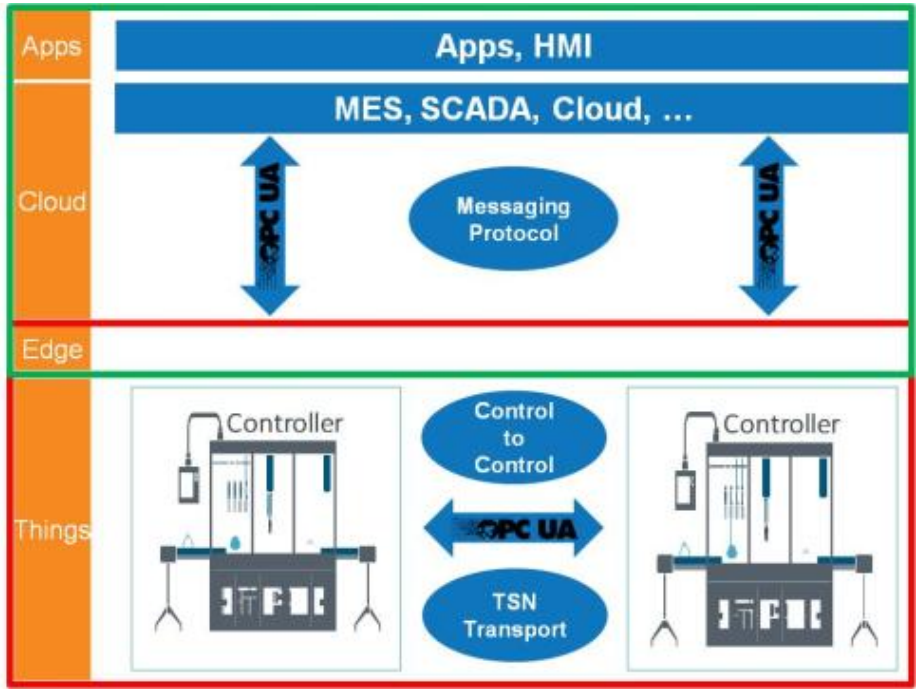
TESTBED TSN

TIME-SENSITIVE NETWORKING

LNI4.0 LABS NETWORK INDUSTRIE 4.0

ARRANGE ACCESS TO APPROPRIATE TESTLABS

- Continuous validation of IEEE 802.1
- TSN product development of 29 companies on neutral ground
- Testbed for standardization validation



Mittelstand 4.0 Kompetenzzentrum Augsburg · Mittelstand-Digital · Analytics · ABB · acontis technologies · Ingenieurbüro Allmendinger · ANALOG DEVICES · assystem · AVNET SILICA · BECKHOFF · br · T · ESR Pollmeier GmbH Servo-Antriebstechnik · EXOR EMBEDDED · FESTO · hilscher · HIRSCHMANN · HUAWEI · intel · KUKA · MITSUBISHI ELECTRIC · PHOENIX CONTACT · PILZ · RENESAS · Rockwell Automation · SCHMERSAL · SICK · SIEMENS · soffico · SPIRENT

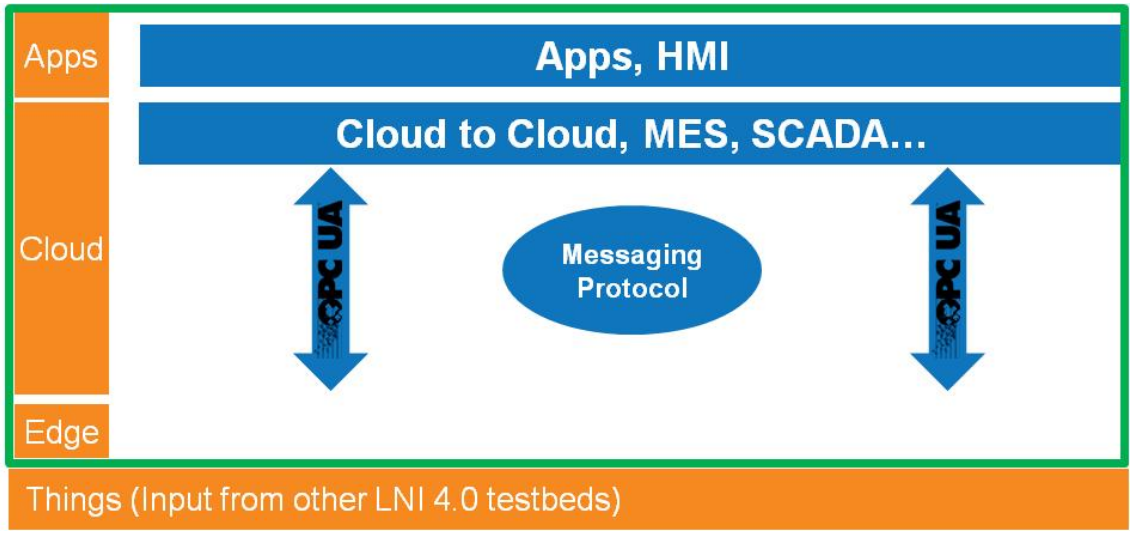
TESTBED C2C

Cloud to Cloud (and Edge to Cloud)

LNI4.0 LABS NETWORK INDUSTRIE 4.0

PASSENDE TESTZENTREN VERMITTELN

- Based on SME requirements
- Interoperability validation 19 companies on neutral ground
- Testbed for standardization (example DIN SPEC 92222)



Mittelstand 4.0 Kompetenzzentrum Augsburg
Mittelstand-Digital
5 Analytics
assystem A NEW PATH TO GROWTH
CEDALO ORCHESTRATING IoT AND THE DIGITAL INDUSTRY
T DEVICE INSIGHT
hilscher COMPETENCE IN COMMUNICATION
HUAWEI
IBM
intel
KUKA
Lufthansa Industry Solutions
Microsoft
MITSUBISHI ELECTRIC Changes for the Better
SAMSUNG
SAP
SCHAEFFLER
SCHILDKNECHT SMART DATA COMMUNICATION
SIEMENS Ingenuity for life
soffico

Agile testing!