

Industrie 4.0

Innovating the Future of Global Industry



Prof. Dr. Dr. h.c. Detlef ZUEHLKE
Executive Chairman smartfactoryKL e.V.

Visit our booth
Hall 8 / D18

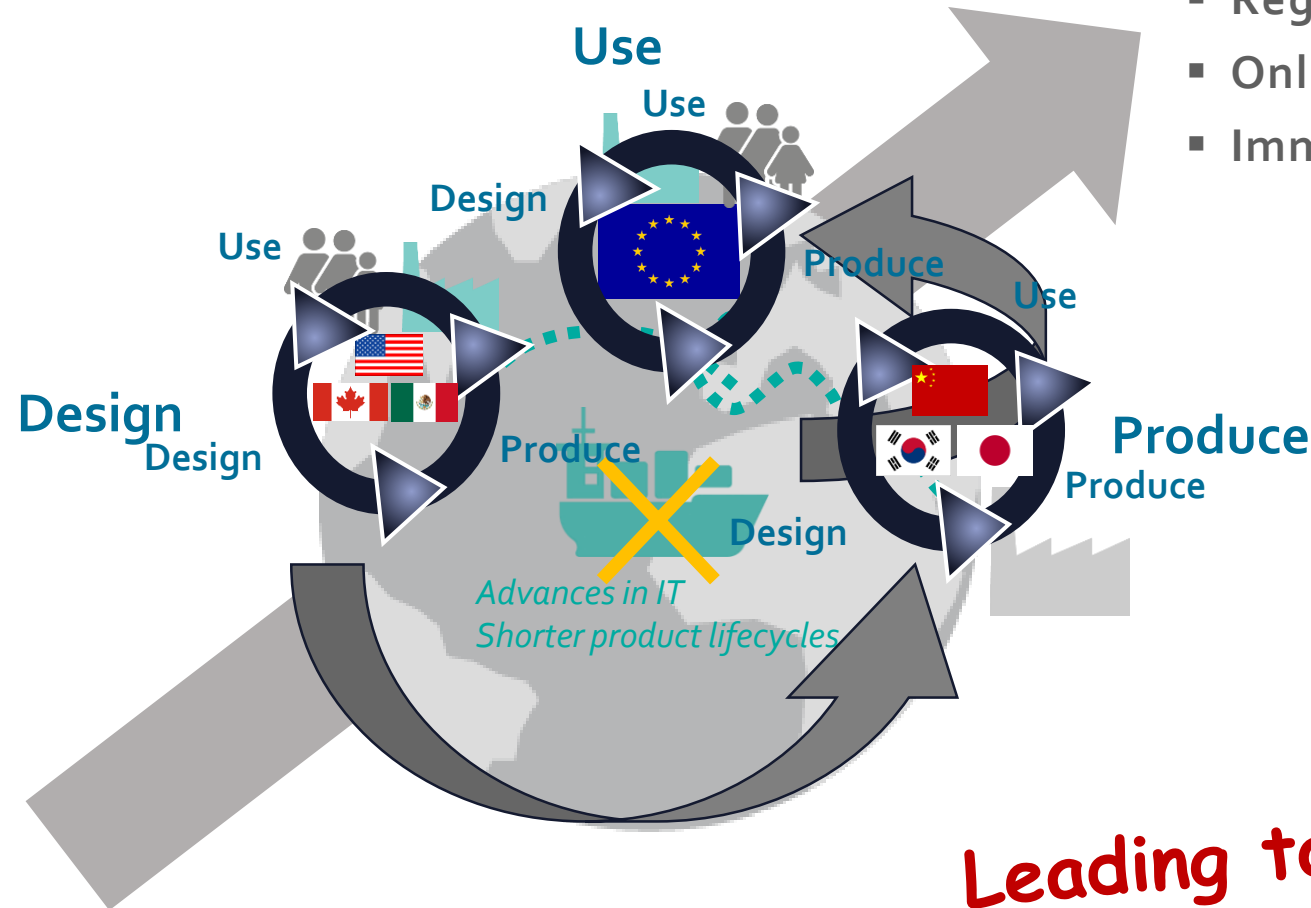
History and challenges

Personalized products are coming



Reshoring production

- to**
- Mass customization
 - Regional production
 - Online driven
 - Immediate delivery

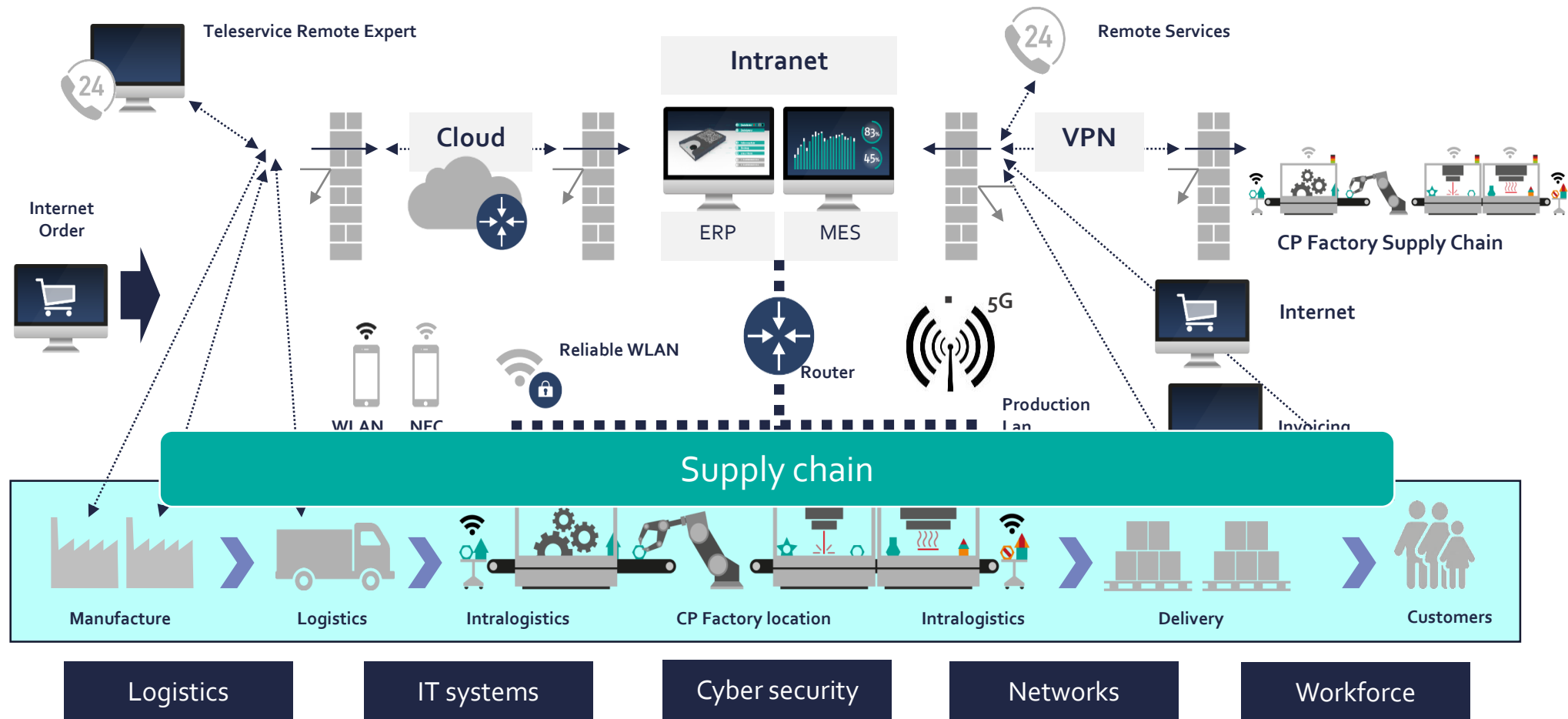


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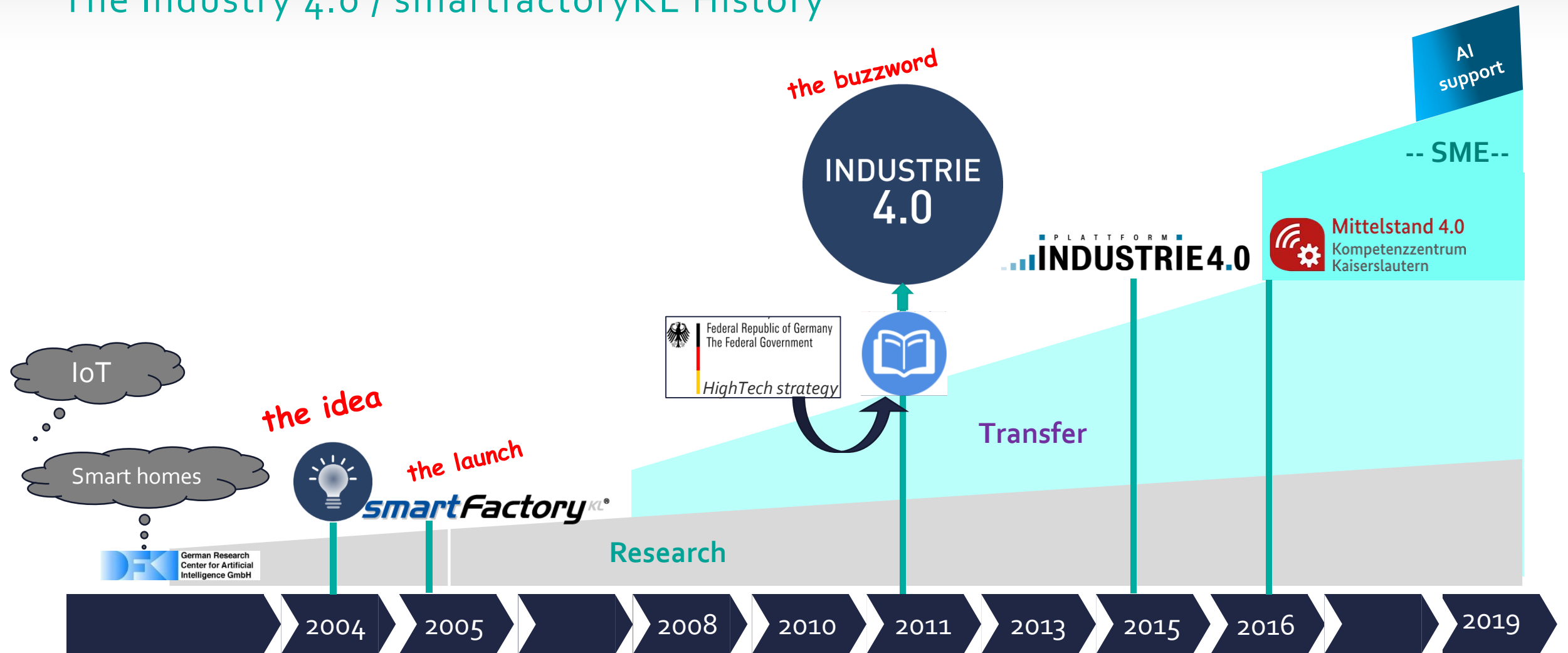
- Mass production
- Cost driven
- Long delivery times

Leading to a new world economic structure?

Digital Transformation of the Industry

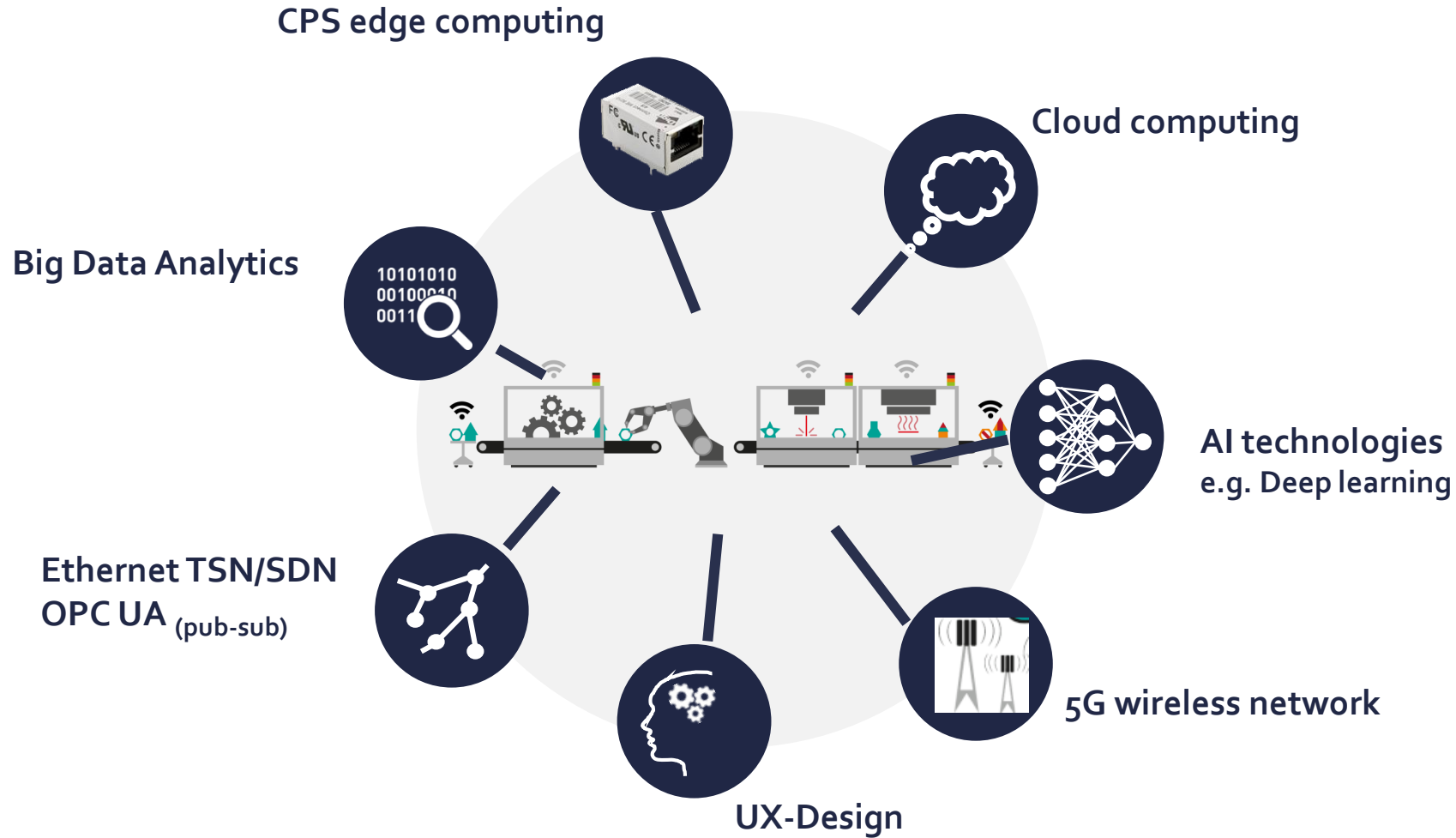


The Industry 4.0 / smartfactoryKL History

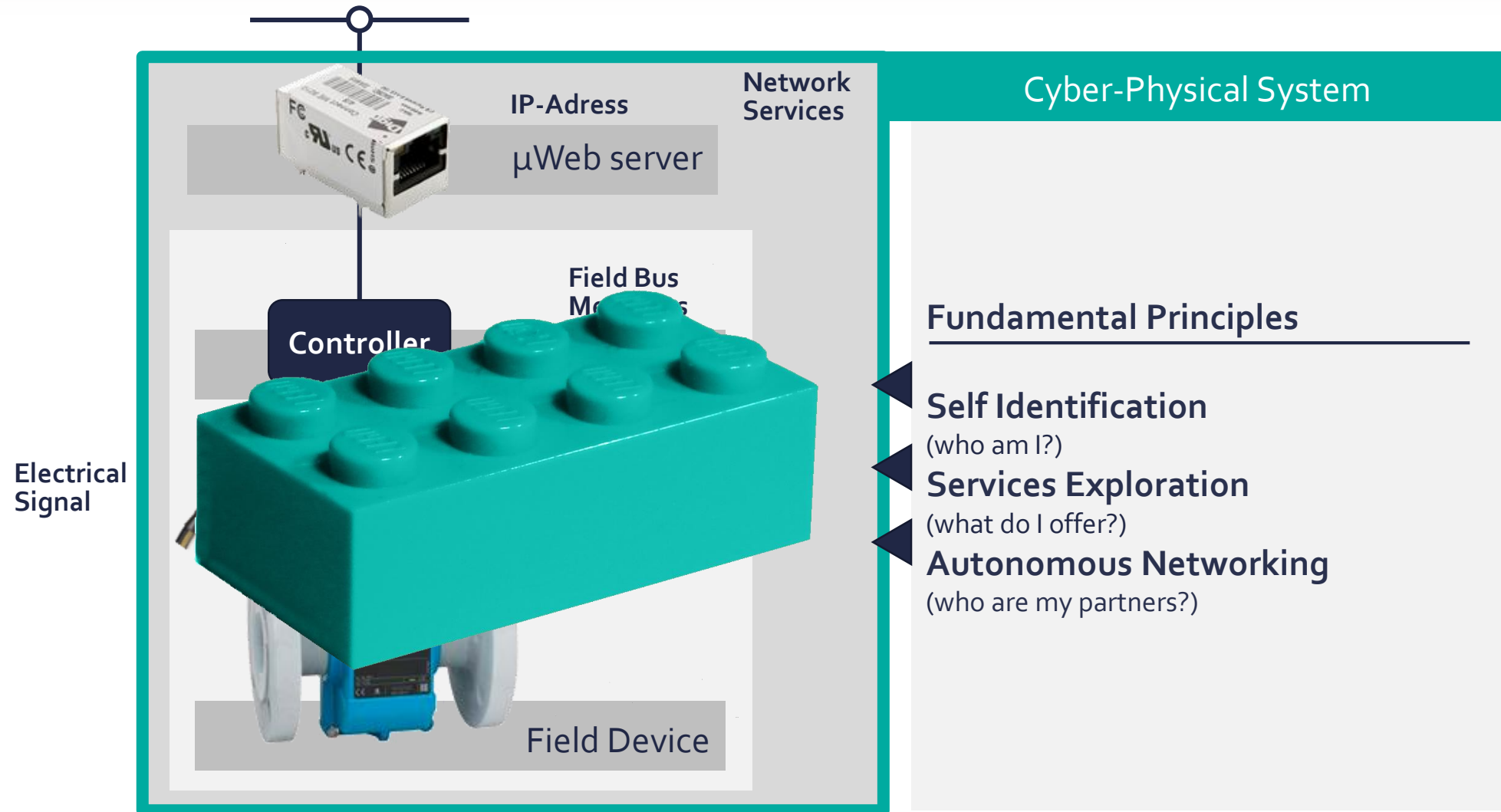


Technologies

Game changing technologies

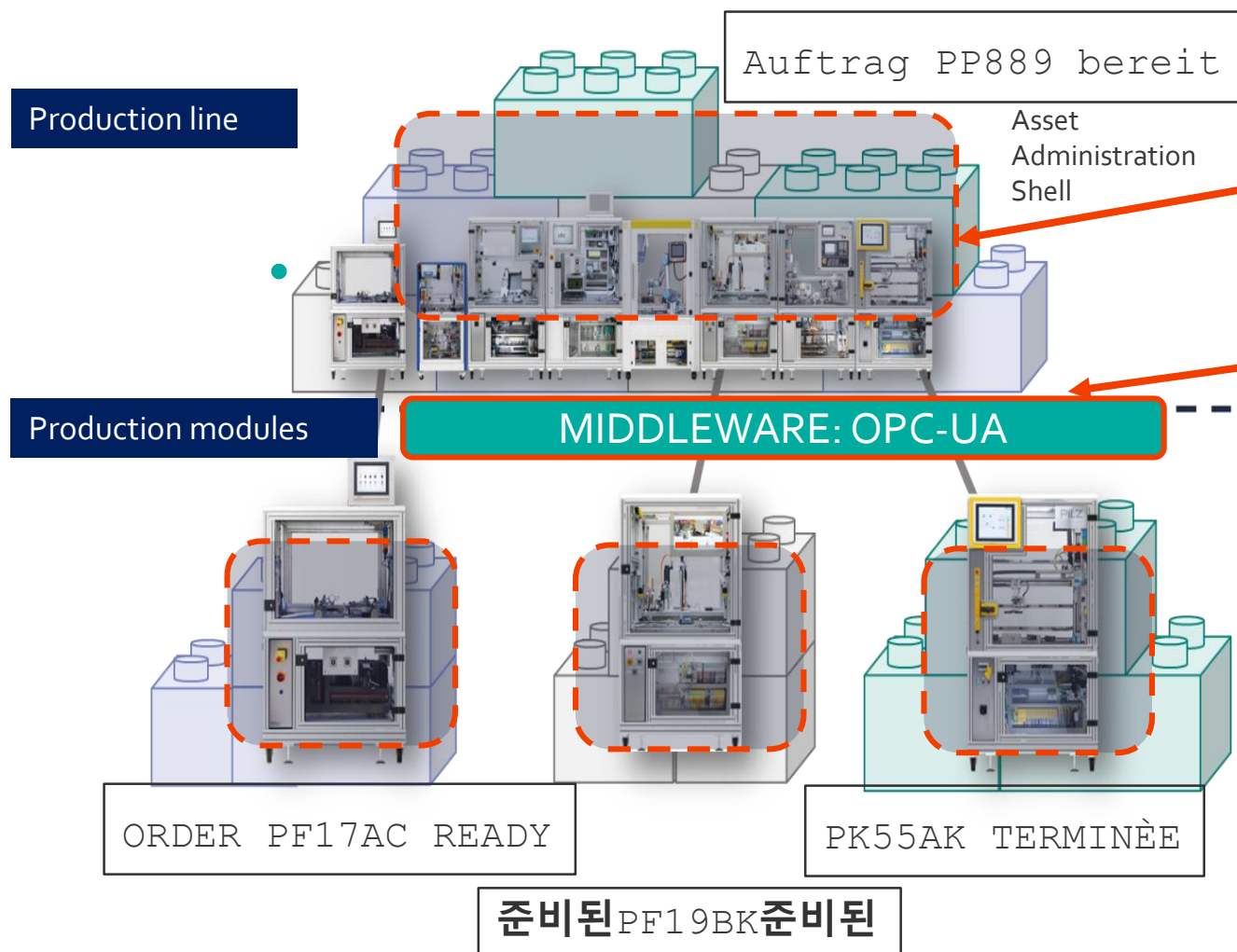


Towards smart modules



The modular agile factory...

...needs a stack of standards



Interoperability
Standards

SEMANTIC SERVICE DESCRIPTION

OWL	OWL-S	SAWSDL	...
AAS	WSDL	EDDL	Device Class

ISO-OSI

7	?	SoA-Services
6		OPC-UA
5		
4		TCP/IP
3		
2		Ethernet, WiFi, 5G
1		

Communication
Standards

Electromechanical
Standards



Han-Modular®

5G wireless network

Mobility with high transfer rate – low latency – low power – reserved bands – secured transmission



www.smartfactory.de

AI solution for data analytics

IoT – data sources

Data Cloud X

Big Data

Pattern Recognition

Learning Inferencing

Reasoning

**STOP
Machine 8
Spindle
Problem**

Pixabay

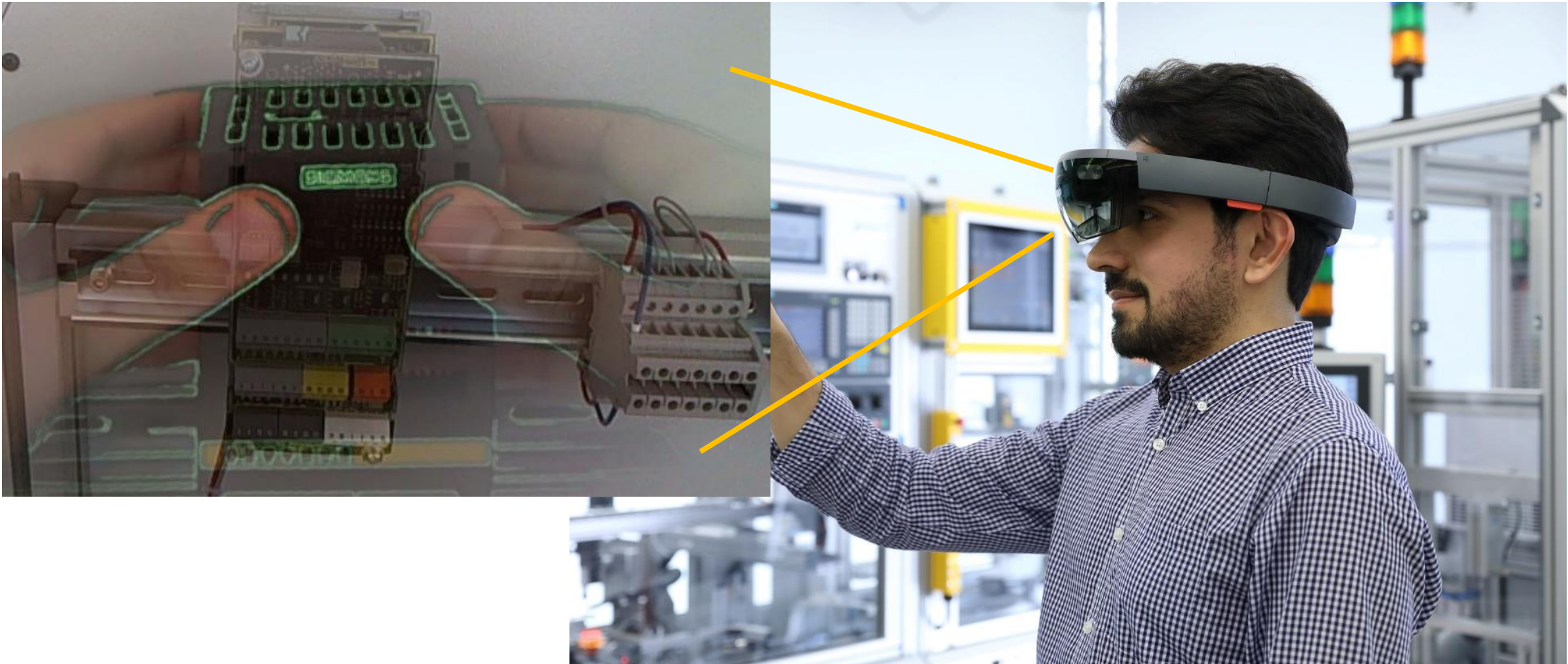
CISCO

Data Cloud Z



Augmented Vision in industrial environment

source IOXP



The *smartfactory*^{KL}

where Industrie 4.0 was born

The Association

Our vision:

Competence and transfer center for the demonstration of innovative ICT in manufacturing

Key data:

- Foundation: 2005
- Legal form: Non-profit registered association
- Executive board: **Prof. Dr. Detlef Zühlke (Chairman),** Andreas Huhmann (Harting),
Dr. Thomas Bürger (Bosch Rexroth), Klaus Stark (Pilz)
- Members: **52 Companies** and research organizations from **10 countries**
- Employees: 50 employees
- Financing: Membership fees, research projects, industry projects, donations



SmartFactory^{KL} is located in the DFKI Kaiserslautern building

Members of SmartFactory^{KL}



as of March 22nd, 2019

SmartFactory^{KL} - a success story

Work together - learn together - present together

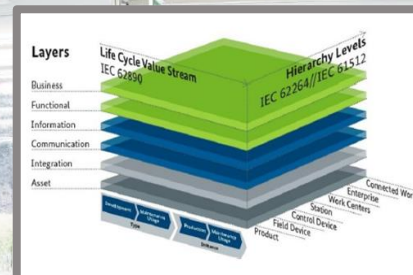
Cyber Security



Networks



Standards



First vendor-neutral full-scale testbed for Industrie 4.0 application

ERP
MES

Modularity

Machine USB

Human support

everything
Plug 'n Play



First Products on the market

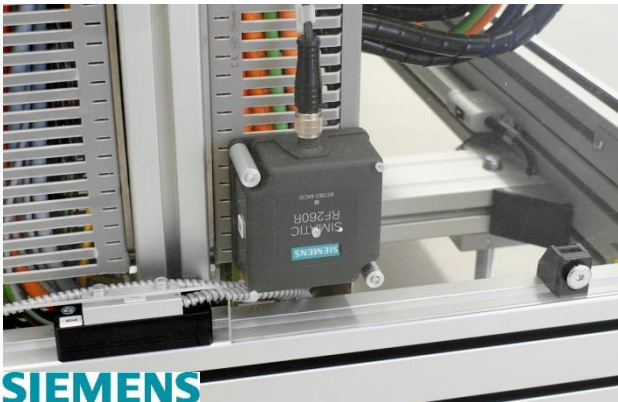
Energy Control, Firewall, Power Distribution



Backbone-Box



Product memory



Module localization

3x400V Emergency Stop
Compr.Air Network



„Maschine-USB“-Connector



PILZ
THE SPIRIT OF SAFETY



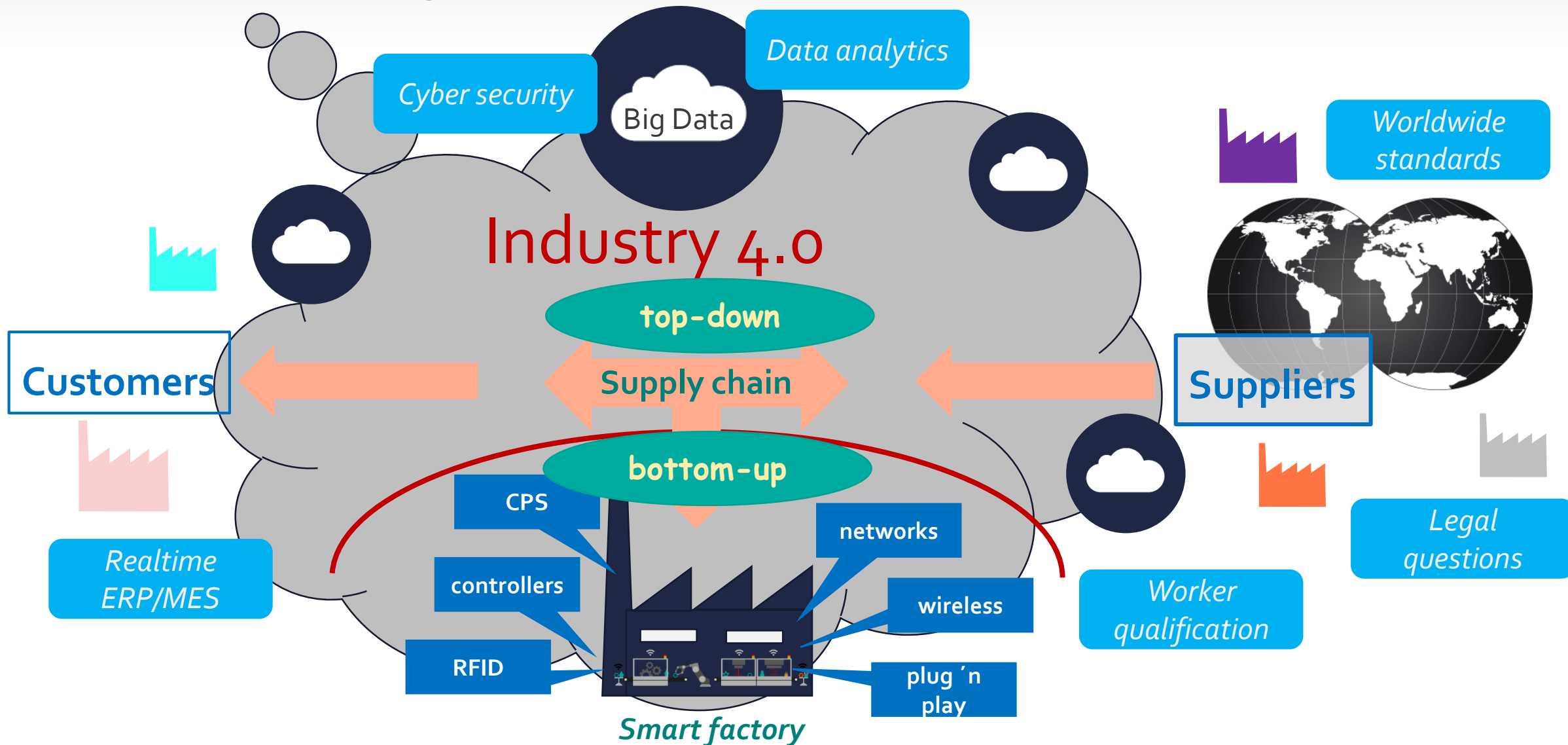
Smart safety system



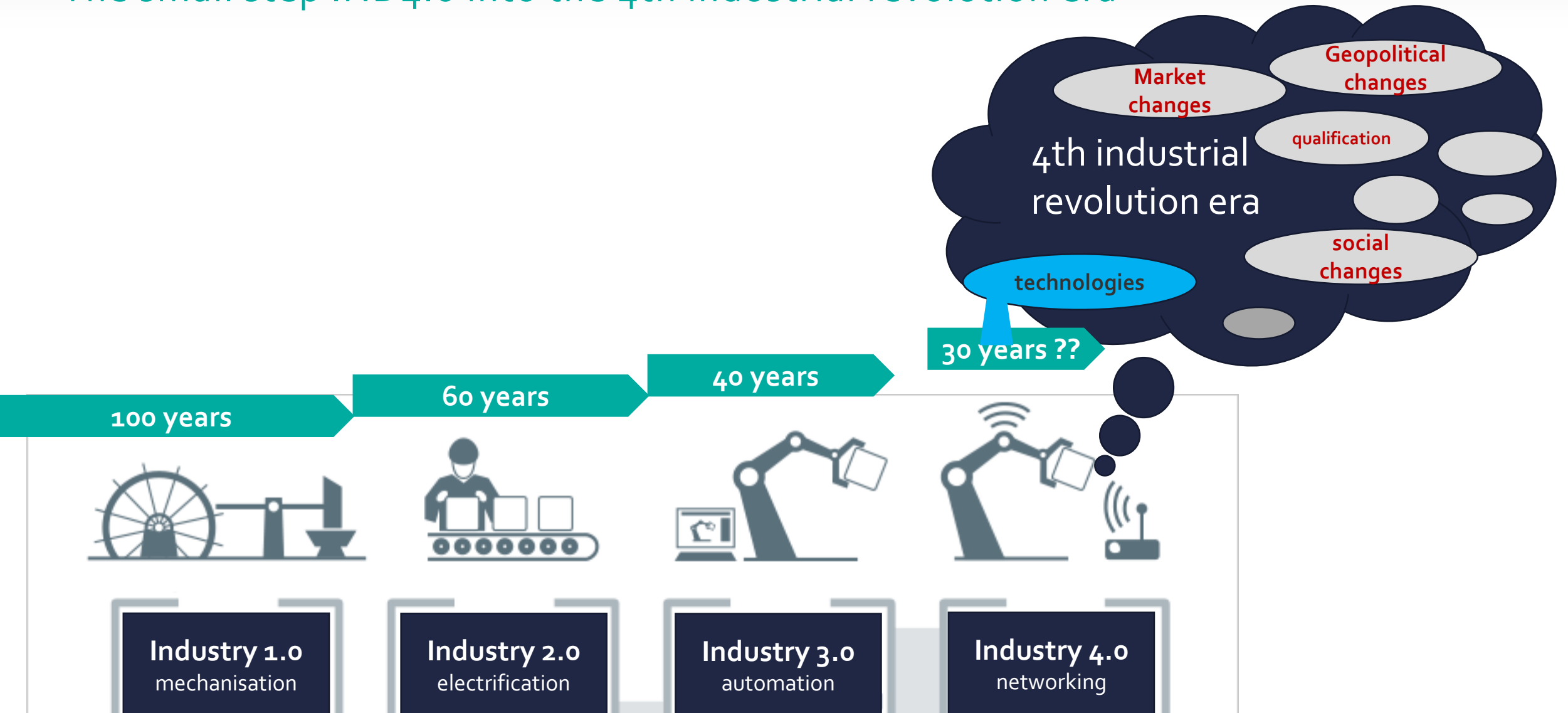
Flexible conveyor locks

Conclusion

From Industry 4.0 to Digital Transformation



The small step IND_{4.0} into the 4th industrial revolution era



Thanks for listening!

Visit our booth
Hall 8 / D18
and see the smartfactory live!



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