

Dr. Jan-Henning Fabian, Leiter des ABB Forschungszentrums Ladenburg

# Jahrestagung der GI-Fachgruppe Architekturen Eröffnung

Power and productivity  
for a better world™



# Gestaltung unserer Welt durch Innovation

## Industrie 4.0 und die Zukunft der Automatisierung



Willkommen am ABB Forschungszentrum Ladenburg  
Architekturen für Industrie 4.0

Industrie 4.0:



Der Begriff wurde 2011 erstmalig auf der Hannover Messe erwähnt.

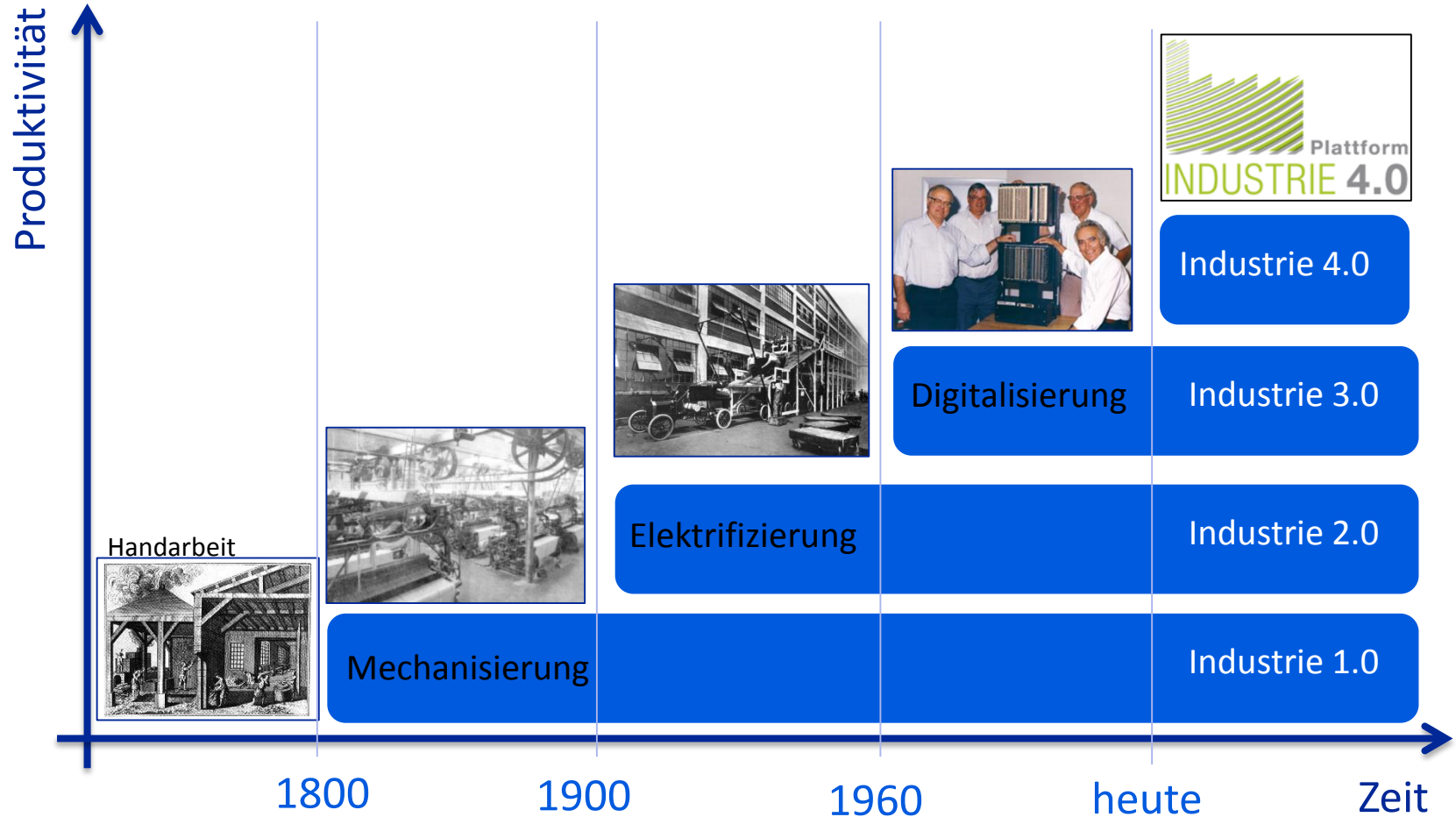


Lenkungskreis der Deutschen Industrie einschließlich der Industrieverbände VDMA, ZVEI und Bitkom.

[www.plattform-i40.de](http://www.plattform-i40.de)

Unterstützung durch Bundesregierung (BMBF, BMWi) und Politik.

# Industrielle Revolution 1.0 bis 4.0

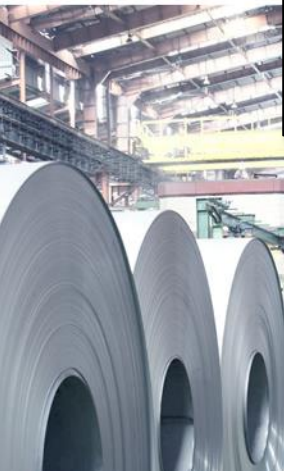
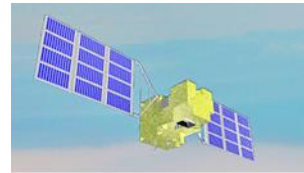




# Innovation: Wettbewerbsvorteil von ABB

## Führend dank beständiger Investitionen in F&E

- Über 1,5 Mrd. US\$ wird jährlich in R&D investiert
- 8.000 Wissenschaftler und Ingenieure
- 700 Forscher in der Forschungsorganisation von ABB
- Zusammenarbeit mit 70 Universitäten



# Corporate Research Center Ladenburg

## Key figures



- One of seven Corporate Research Centers worldwide
- ca. 110 scientists in Corporate Research Germany
  - Plus 20-30 students, postdocs, guests
- Project volume ca. 15 M€ / year
- >50 inventions, >100 publications per year

# Corporate Research Center Ladenburg

## Strategic Focus Areas

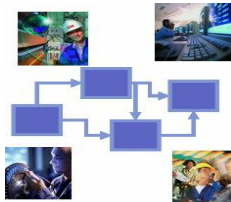


### Plant Automation

Next Generation **architectures and engineering methods** for process and batch automation systems from field to plant level

### Factory Automation

New **technologies and engineering methods** for efficient integration of key components in discrete automation applications



### Service Solutions

Inventing and driving industrial service automation with **technologies, processes and business models**

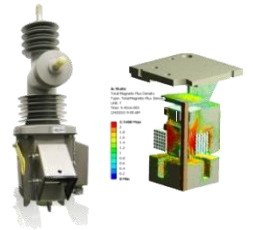
### Building Automation

**Home and building automation** enabling energy efficiency, ambient assisted living, E-mobility and grid integration

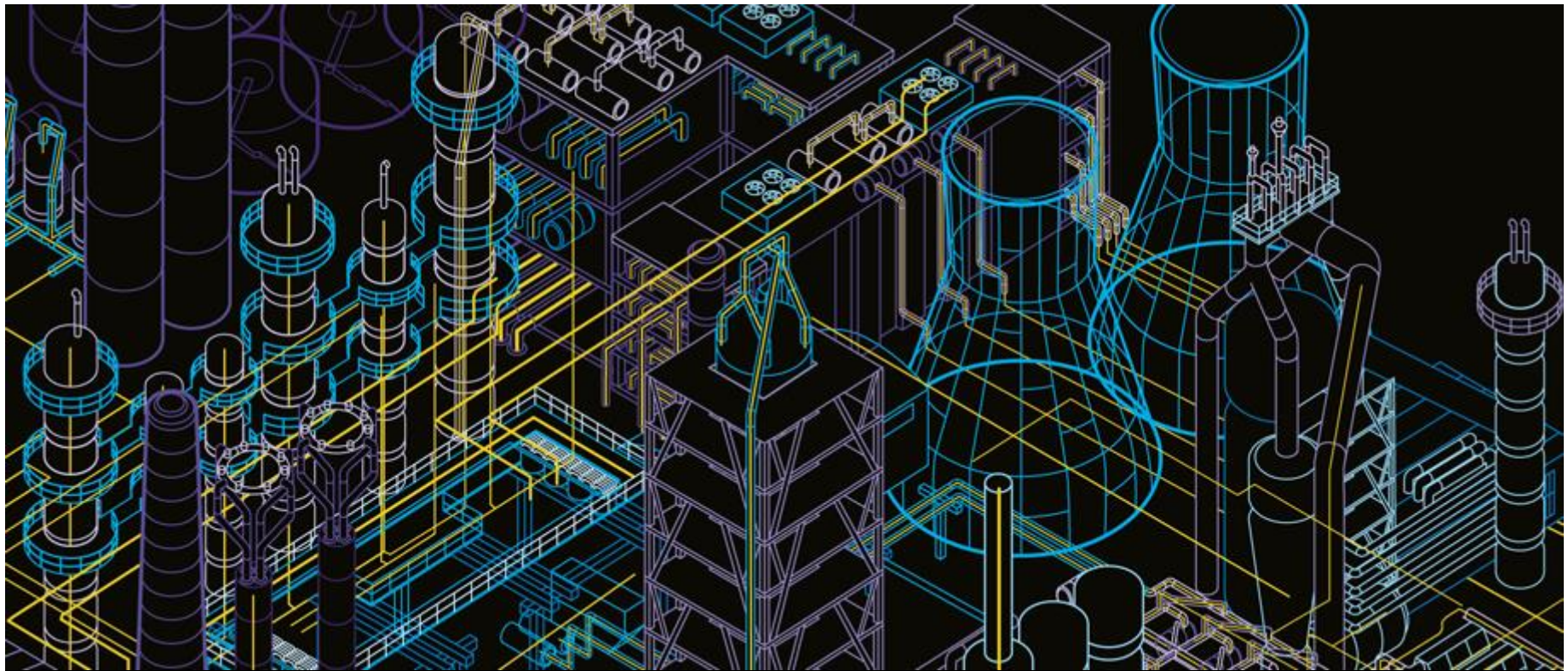


### Power Device Mechatronics

New **actuator and sensor solutions** on device level for efficient and reliable transmission and distribution of electricity





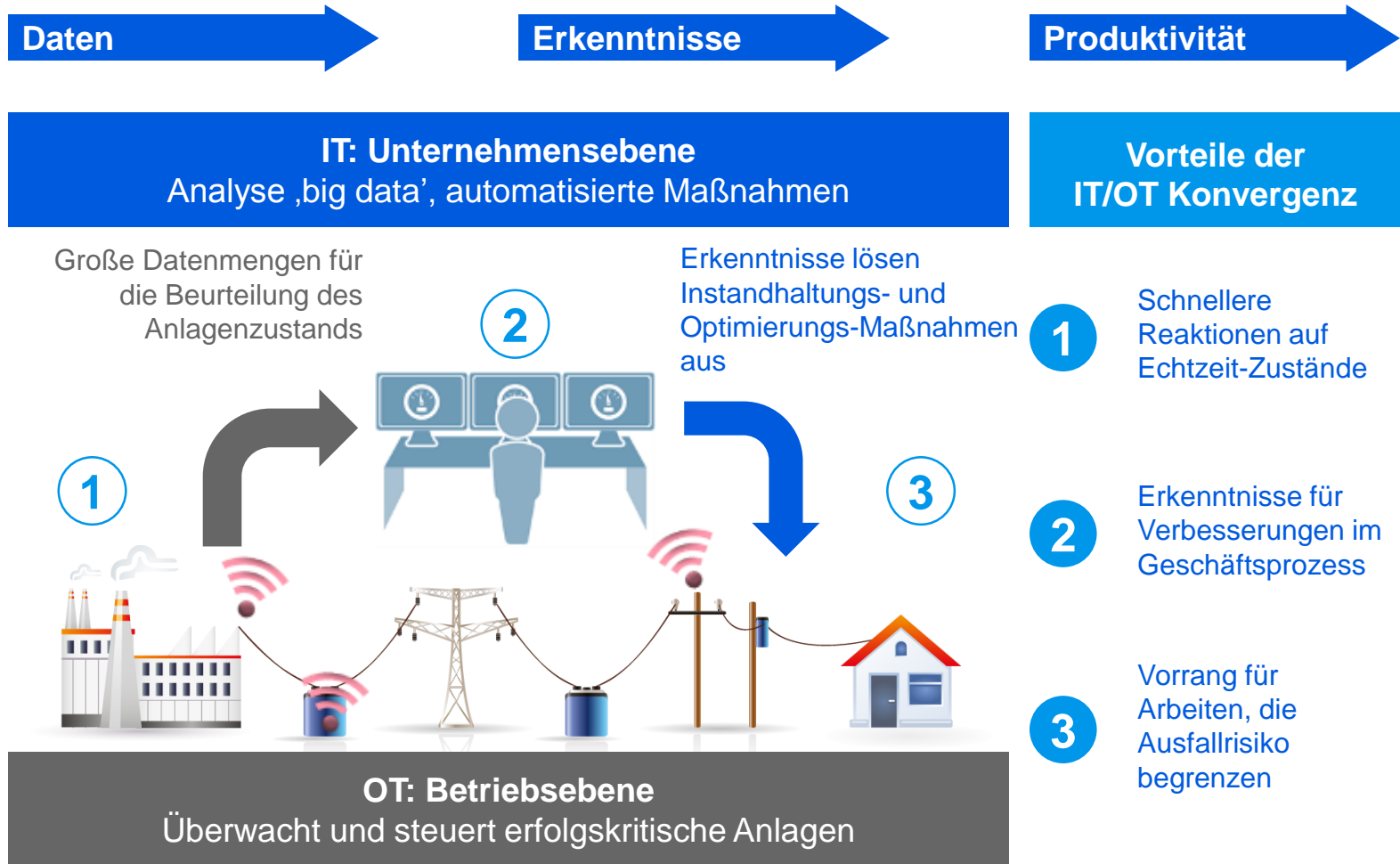


Dr. Christian Zeidler, ABB Corporate Research Germany

# Industrie 4.0 – Motivation

# OT / IT Konvergenz

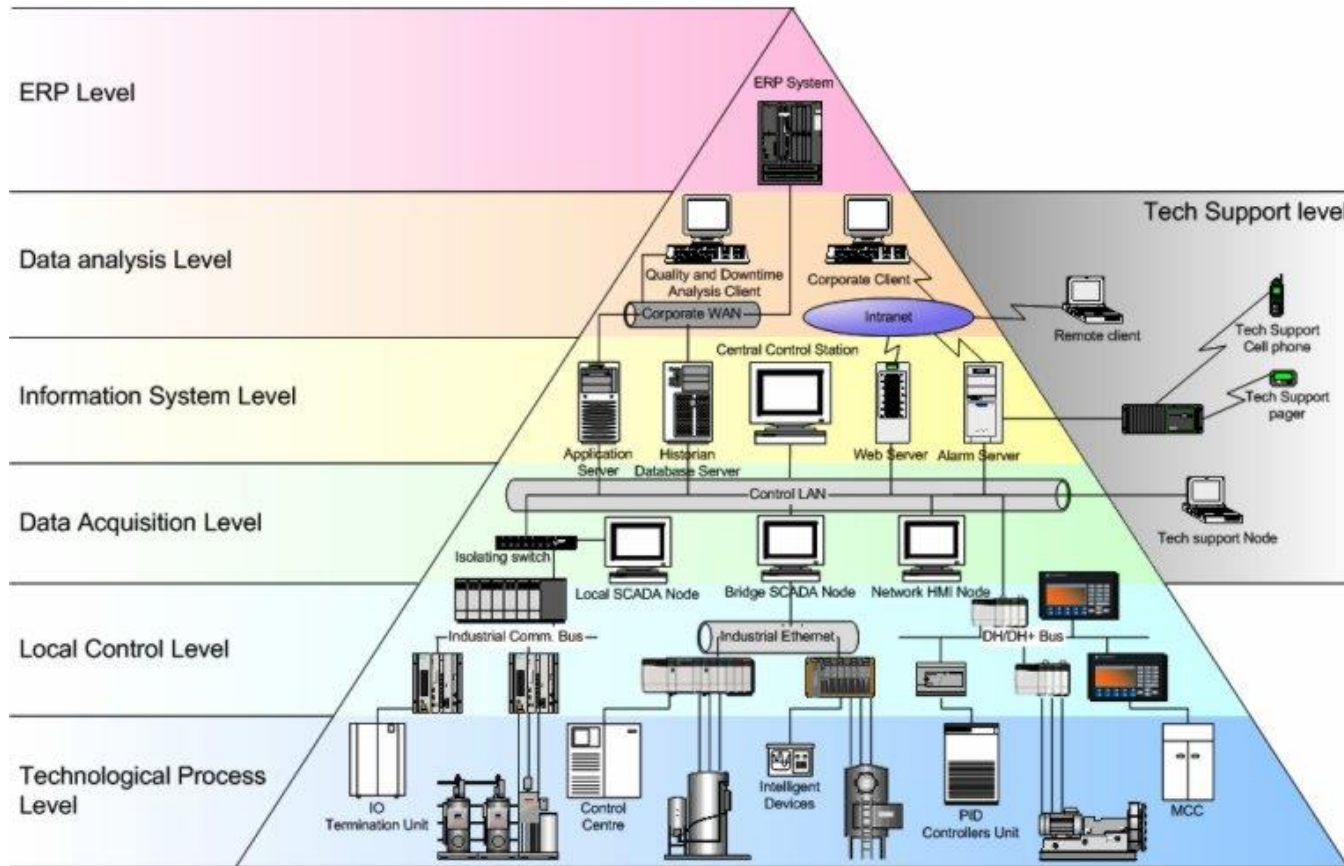
## Erschließt neue Regelkreise für Geschäftsoptimierung



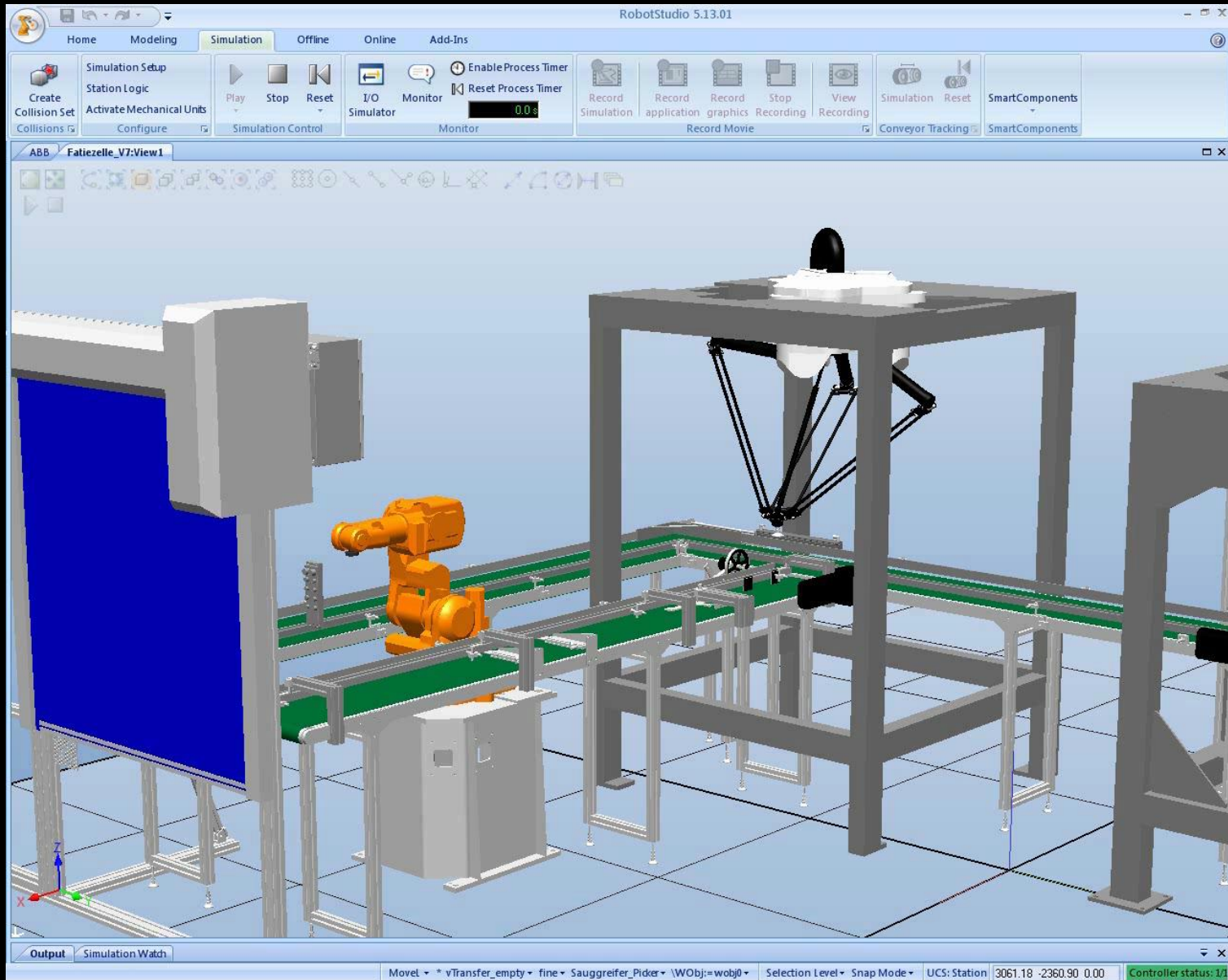


# Systemarchitekturen Heute

## KRAKEN Automation System Pyramid

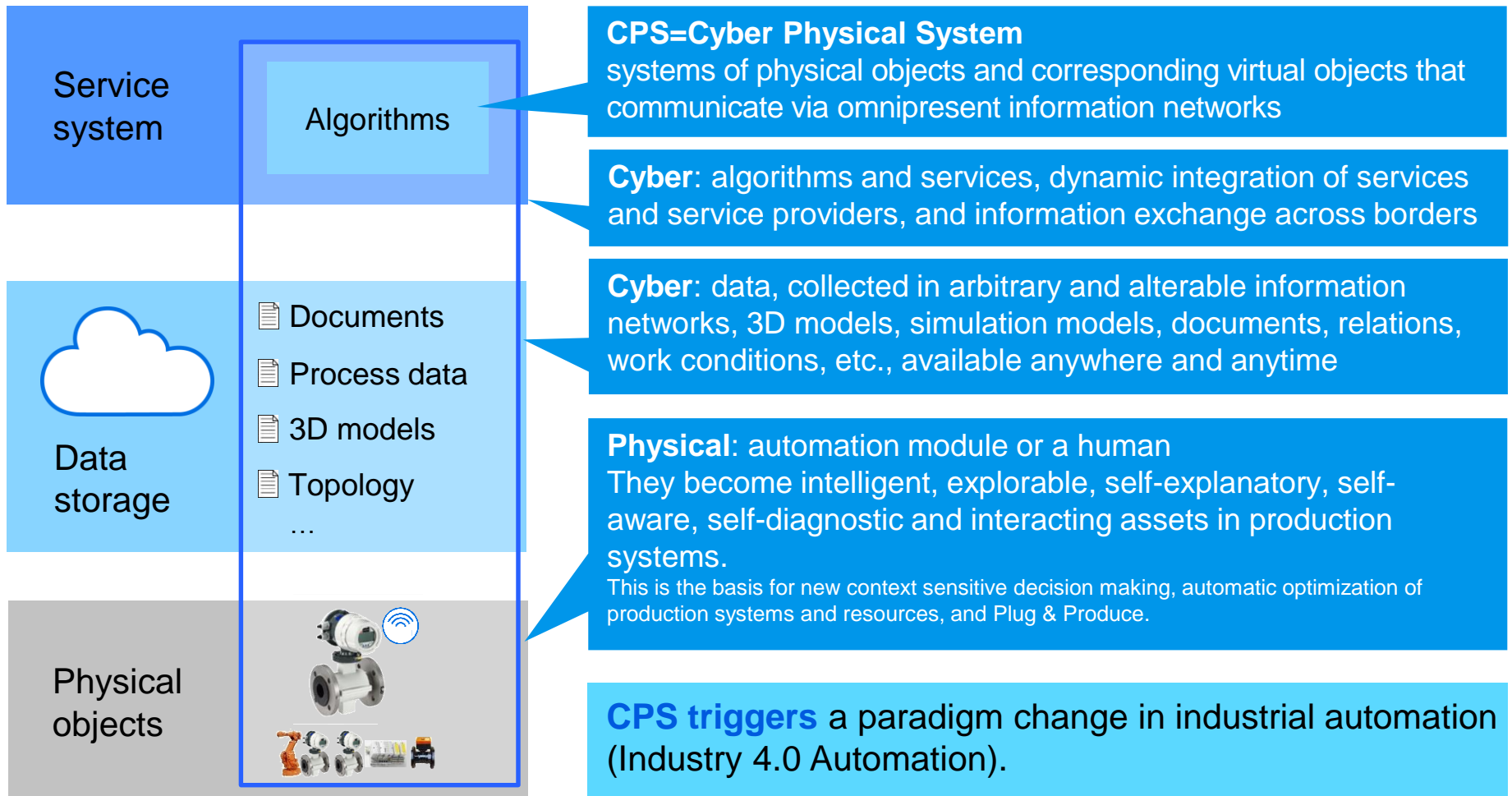


# Virtual Commissioning Factory Automation Test and Integration Environment



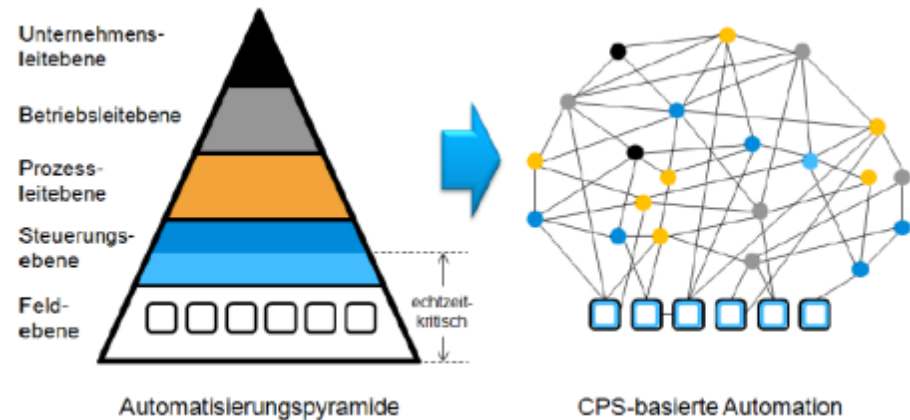
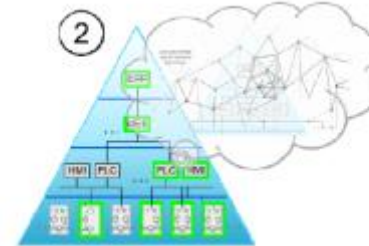
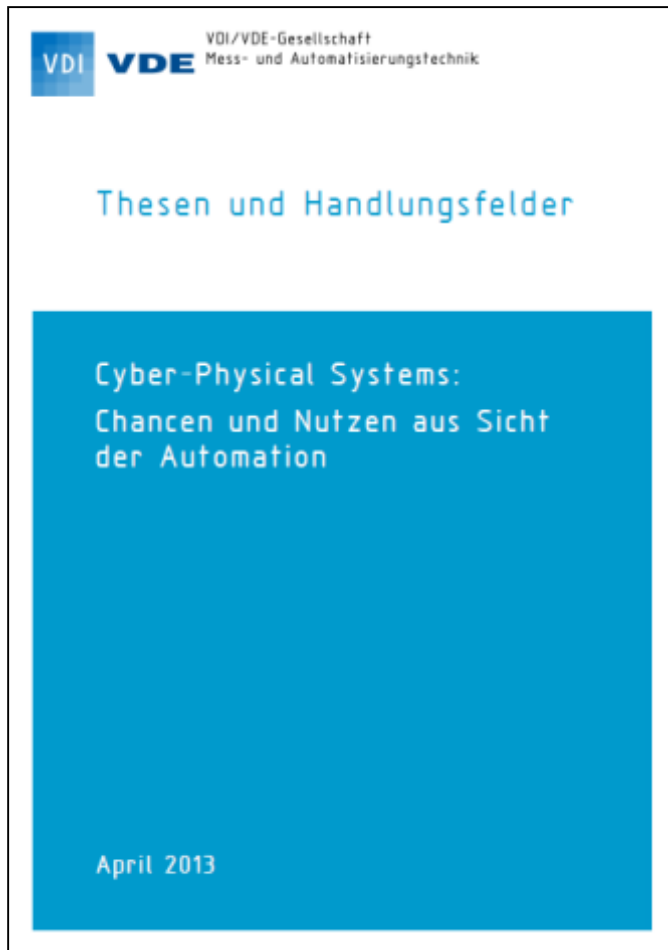
# Industrie 4.0 Automation

## Cyber Physical Systems – Technical Overview



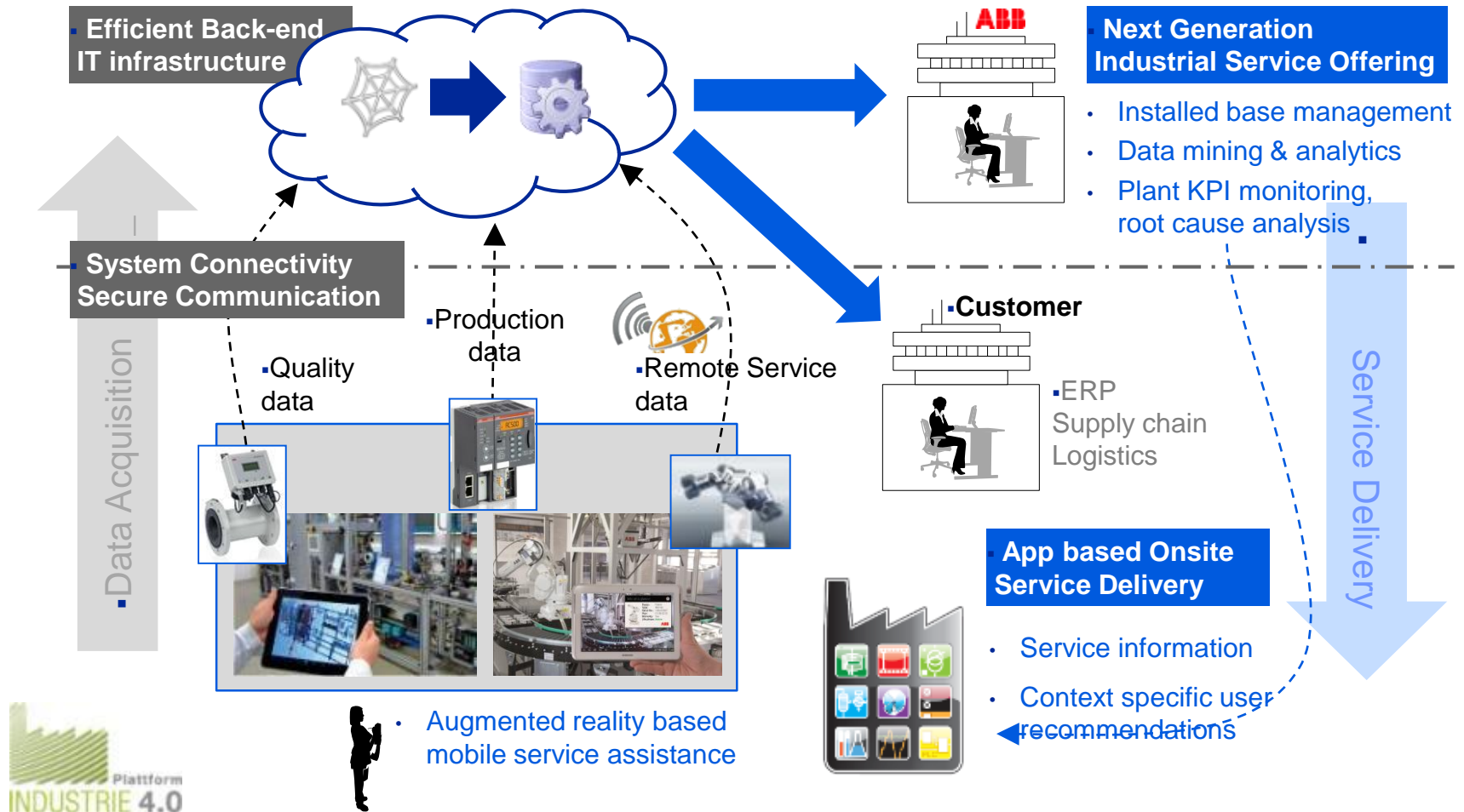


# GMA Positioning Paper Cyber Physical Systems in Automation



# Industry 4.0 – The Future of Industrial Automation

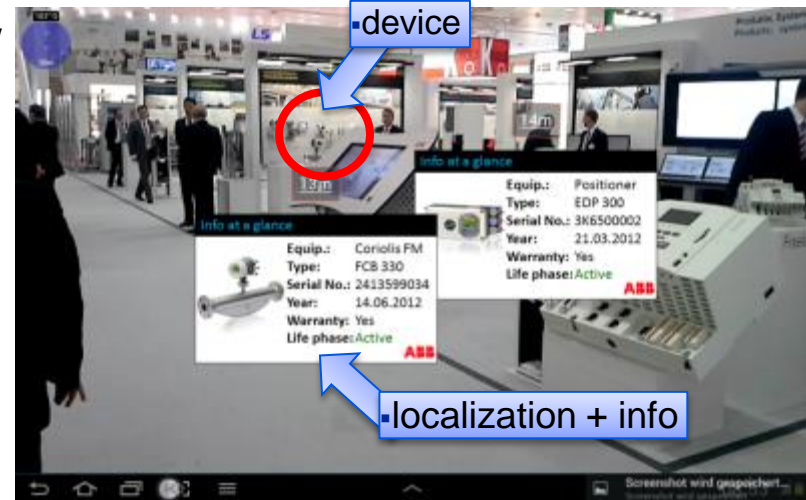
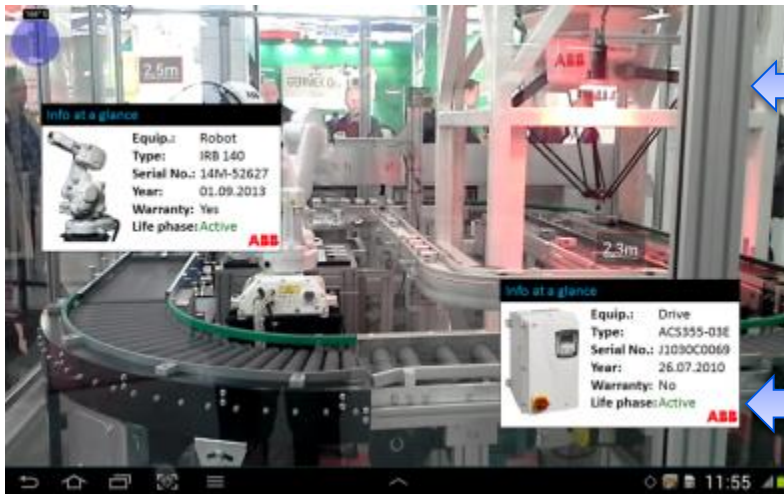
## Services across functional and organizational borders



• The Internet of Things and Services - Networking People, Objects and Systems

# Hanover Fair 2013

## Augmented Reality App 4 Service

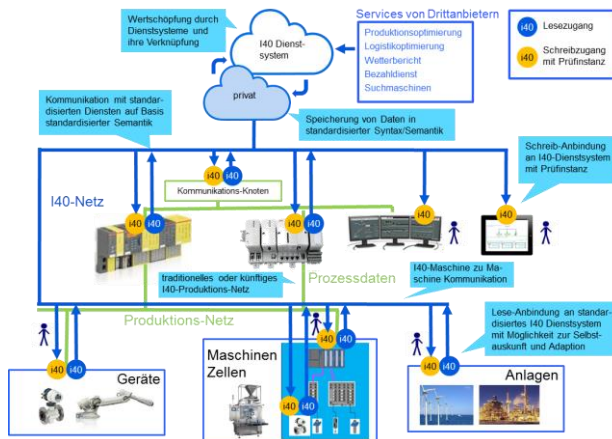


- Technology demonstrator of an augmented reality application for service for the Hannover Fair 2013 (developed @ DECRC).
- Localization of the device based on GPS technology guides the user to the device.
- Provides additional service related information (e.g. condition monitoring data, ServIS information, etc.) on top of the actual live camera pictures



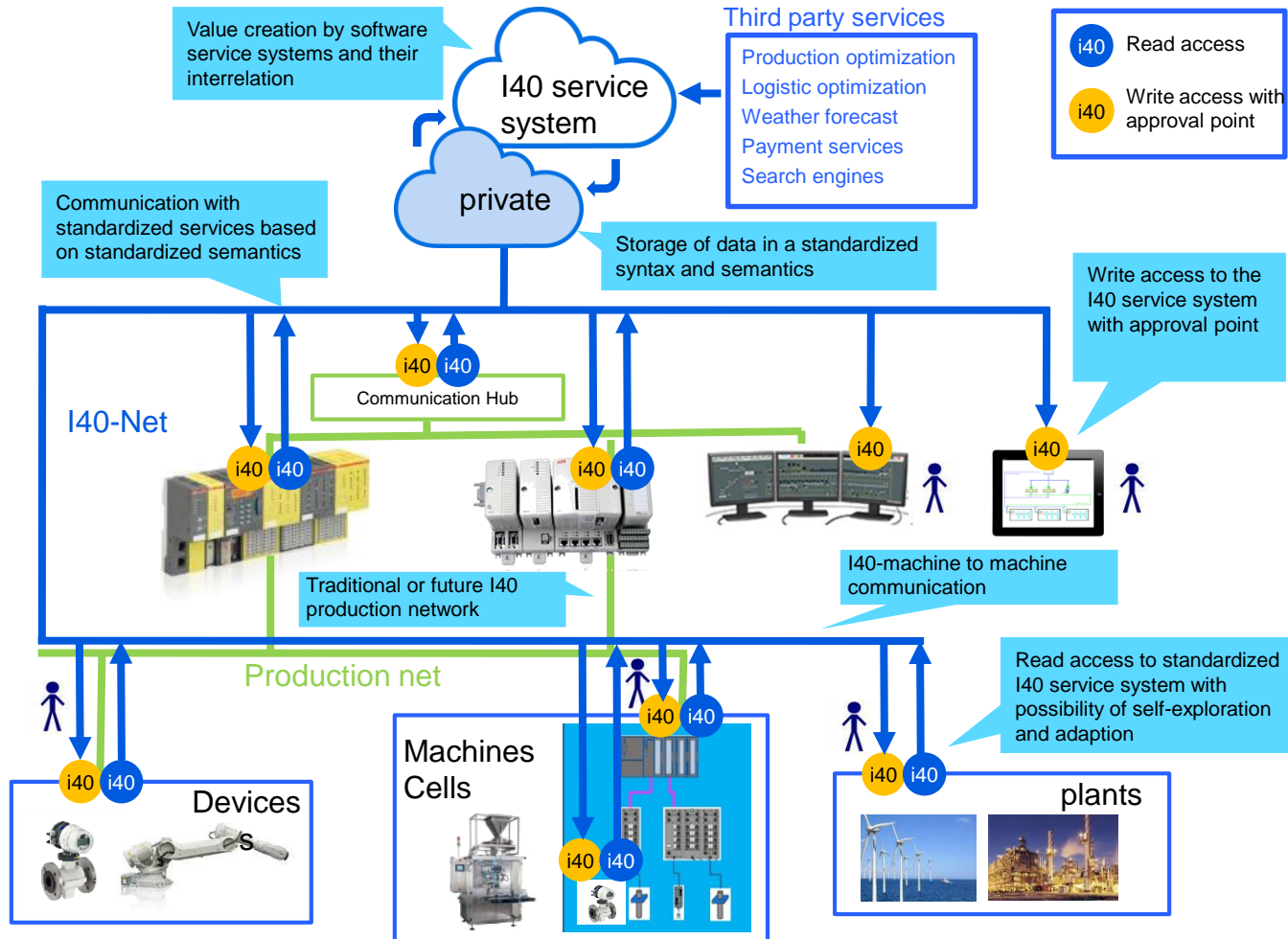
# Industrie 4.0 Dimensionen

- System Architektur
  - Physikalisch
  - Logisch
  - Datenhaltung und Strukturen
  - Dienste (System + Anwendungen)
  - Sicherheit + Authentifizierung
- Life-Cycle
  - Konzeption + Errichtung
  - Betrieb
  - Service
  - Evolution



# Industrie 4.0

## Reference topology



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