



Beyond M2M: The Internet of Things & Services in the manufacturing industry

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Münchner Kreis Fachkonferenz, 06.05.2013



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Beyond M2M: The Internet of Things & Services

2012 key figures

Bosch Group

- 52.5 billion euros in sales
- 306,000 associates including 42,800 in research and development
- 264 manufacturing sites



Automotive Technology

- World's largest supplier of cutting-edge automotive technology

59 %
share
of sales



Industrial Technology

- World's leading manufacturer of large gearboxes, drive and control, packaging, and process technology

41 %
share
of sales



Energy and Building Technology

- Leading manufacturer of thermo-, solar- and building security technology
- World's largest supplier of heat pumps



Consumer Goods

- World's largest power tool manufacturer
- Leading the field in household appliances



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Bosch Software and Systems House

Overview Bosch Software Innovations



Industry Solutions

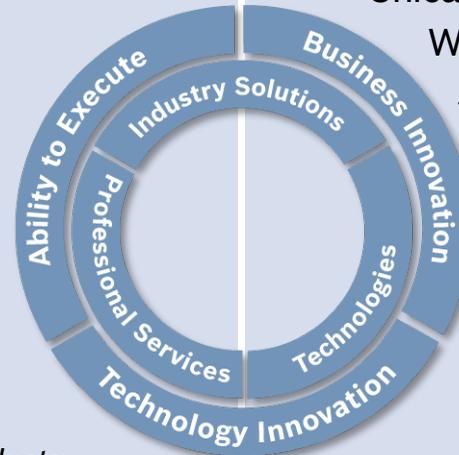
- *Automotive/OEM, Energy, Finance, Health, Insurance, Manufacturing, Public, Retail, Telco*

Technologies

- *M2M (Device Management)*
- *BPM (inubit)*
- *BRM (Visual Rules)*

Professional Services

- *Planning, Implementation and Operation of Solutions, based on our Software Products*



• Locations:

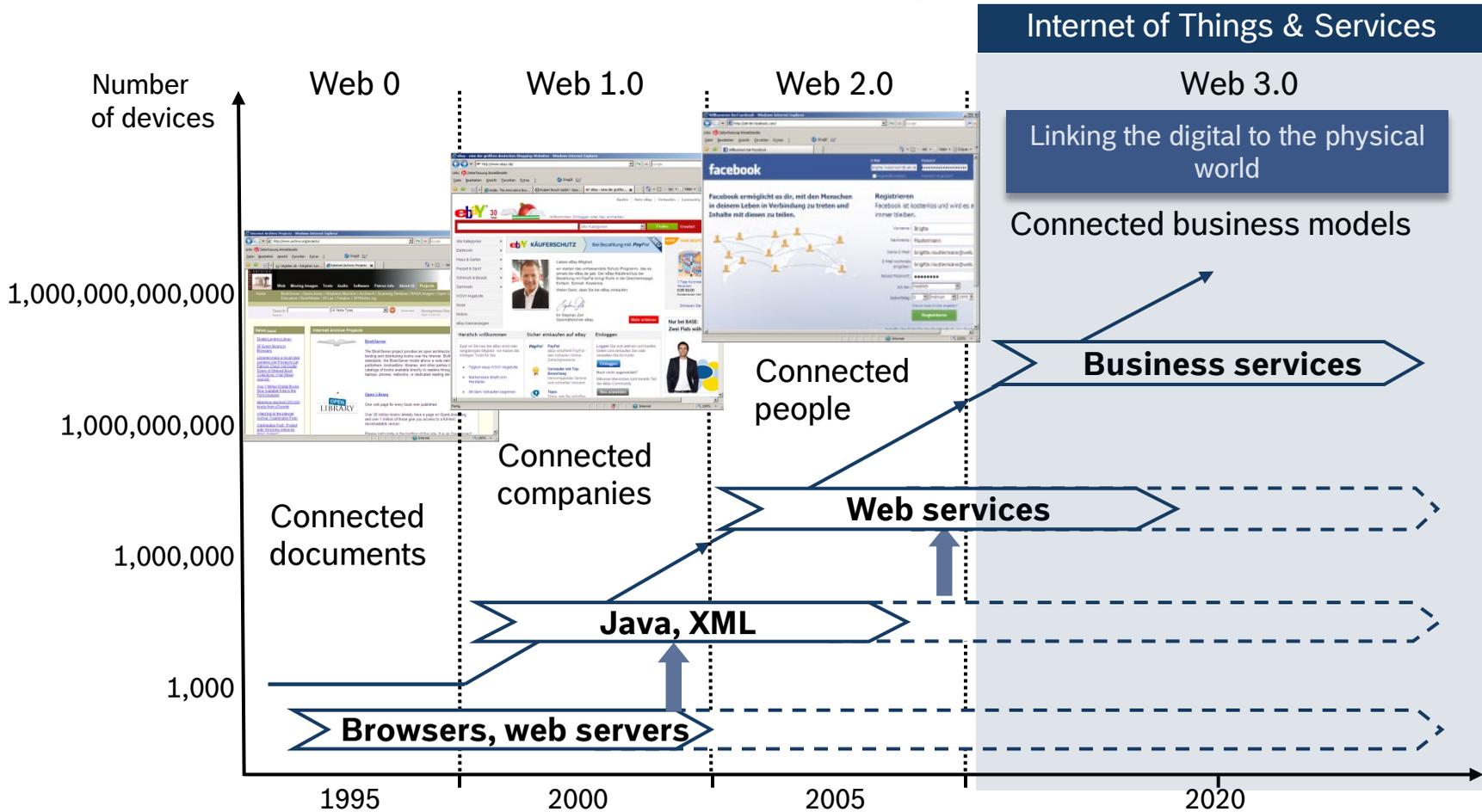
Immenstaad, Stuttgart, Berlin, Chicago, Palo Alto, Washington D.C., Singapore, Shanghai and Melbourne

• Personnel:

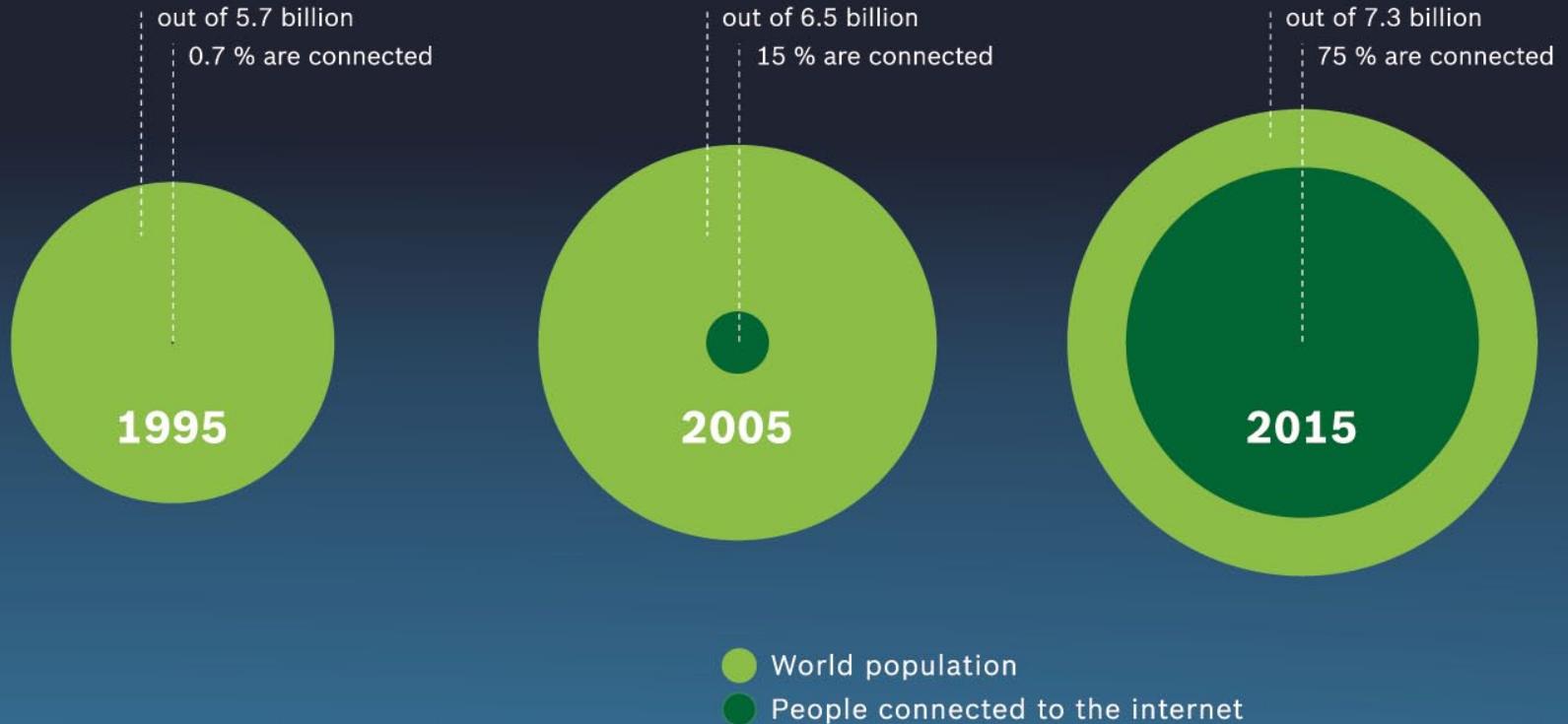
~ 535 worldwide



Internet – The Driver of Change



People connected to the internet

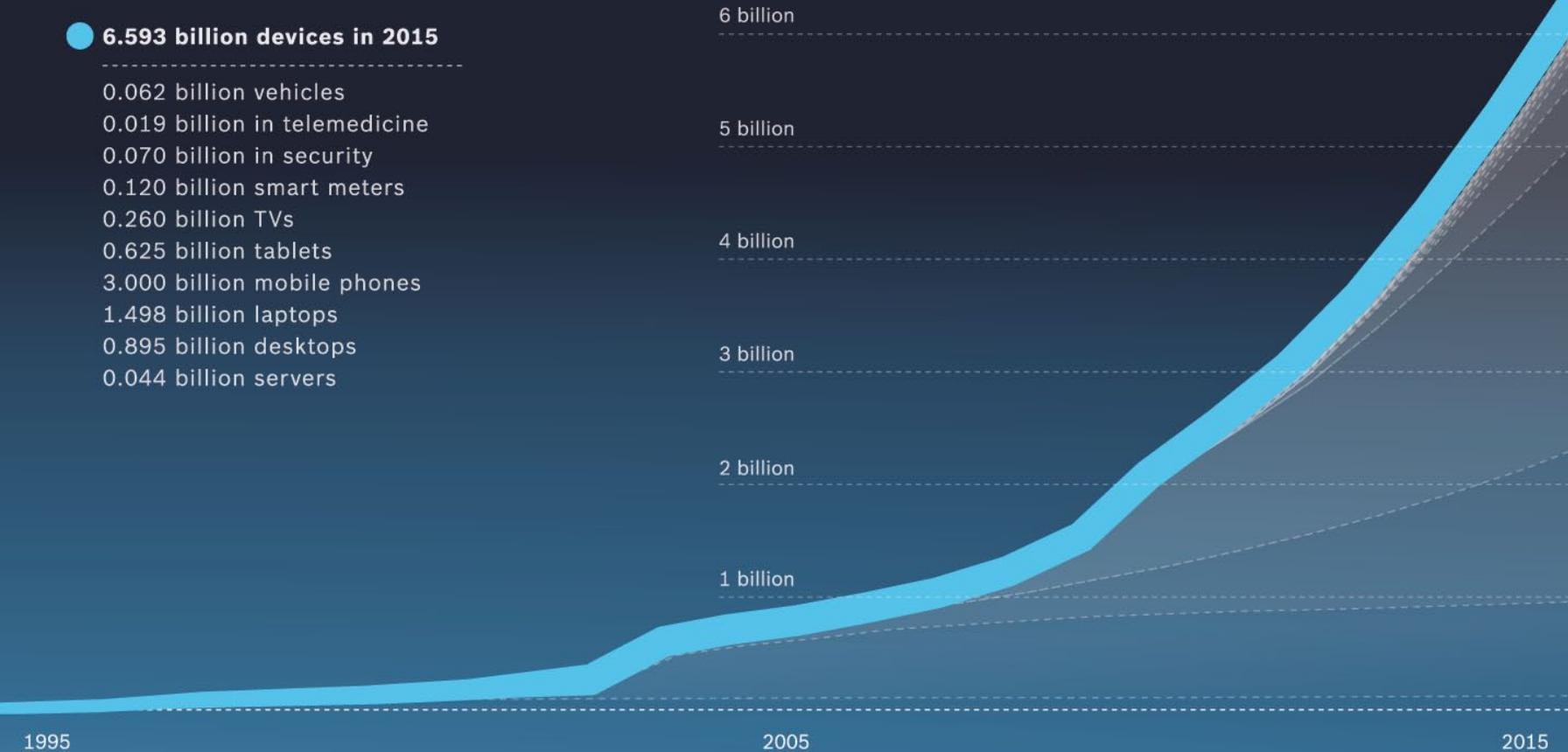


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Devices connected to the internet

6.593 billion devices in 2015

- 0.062 billion vehicles
- 0.019 billion in telemedicine
- 0.070 billion in security
- 0.120 billion smart meters
- 0.260 billion TVs
- 0.625 billion tablets
- 3.000 billion mobile phones
- 1.498 billion laptops
- 0.895 billion desktops
- 0.044 billion servers



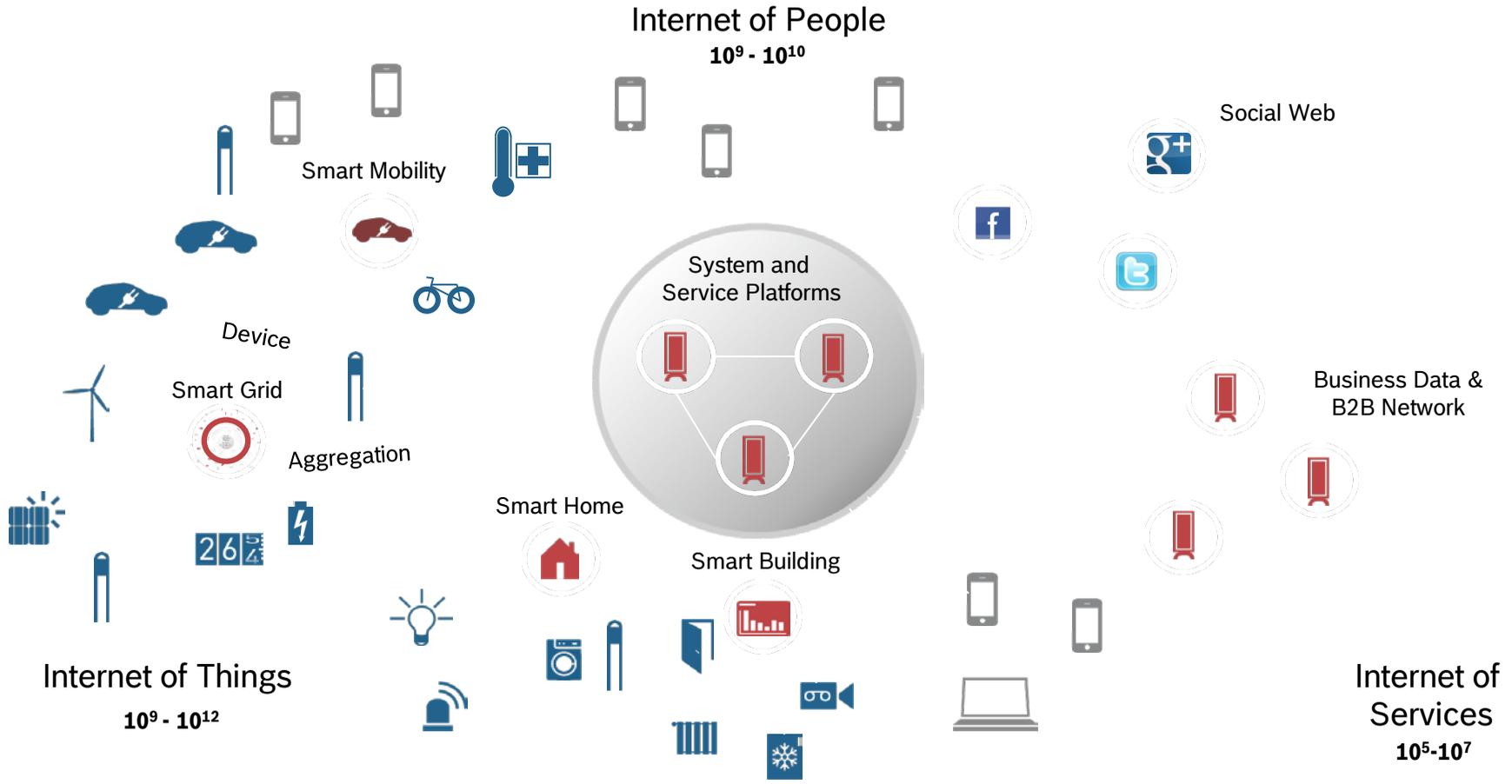
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Massive Distributed System of Systems



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Connected Mobility



Connected City



Connected Energy

Enabling business success
in a connected world



Connected Industry



Connected Life



Connected Enterprise

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John Deere machines (U.S.): “Machine health revolution”



◆ Rules Technology

Machine diagnosis with telematics

- Range of services for John Deere customers
- Intelligent monitoring of machine KPIs and fluid analysis
- Optimum servicing intervals

Project figures

- **Minimization of downtime**
- **Price reduction for servicing contracts**
- **Competitive advantage:**
“Move More Dirt for Less Money” (quote, John Deere)

- Global market leader
- 2010 sales: USD 26 billion
- > 50,000 employees worldwide

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Bosch Healthcare: “Closer to the patient”



Benefits

- Improved **adherence to therapy**, reduced **mortality**, improved **quality of life**
- **Increased efficiency** of medical service providers
- Very good **acceptance** among patients & attendants

◆ **Platform for the Internet of Things**

Bosch Telehealth Plus

- Constant IP-based exchange of vital & behavioral parameters between doctors & patients
- Rule-based analysis of health
- Regular refinement of detection parameters by trained medical staff

- USA successfully implemented
- Projects Charité, Bosch, Asklepios
- Techniker Krankenkasse: COPD patient

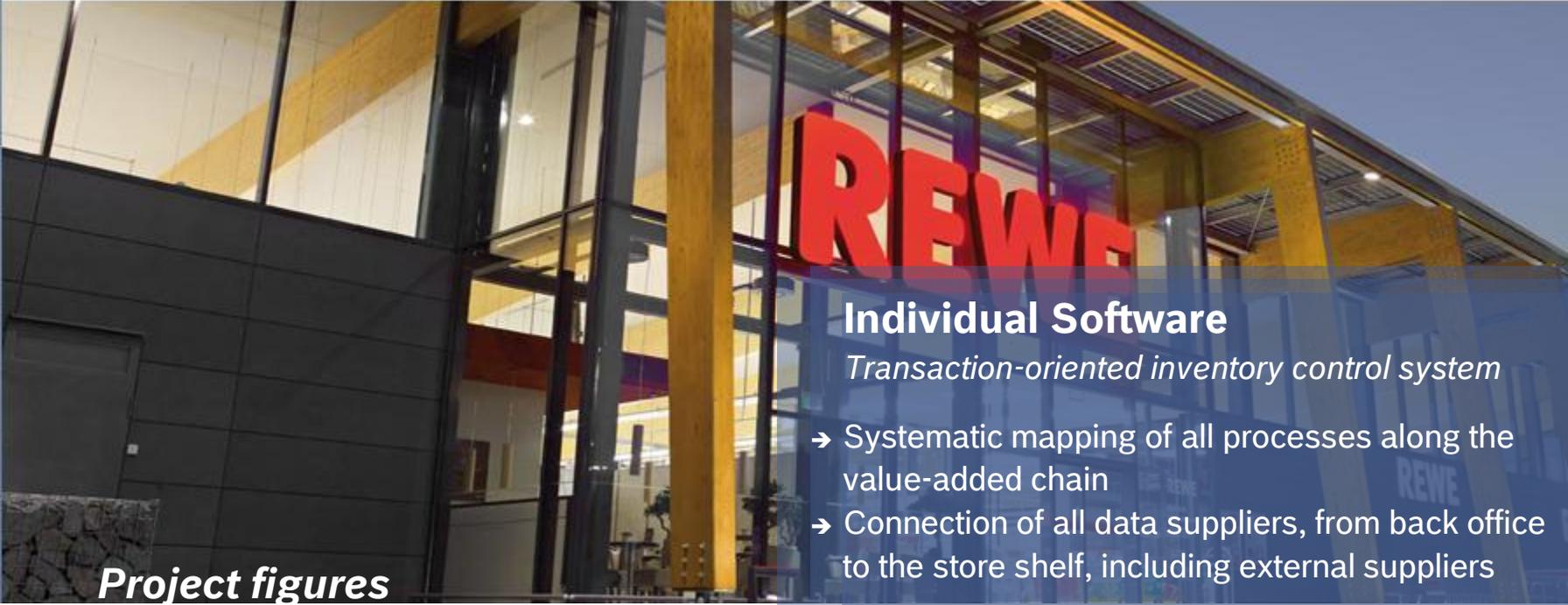
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REWE retail group (Germany): “No customer need goes unanswered”



Individual Software

Transaction-oriented inventory control system

- Systematic mapping of all processes along the value-added chain
- Connection of all data suppliers, from back office to the store shelf, including external suppliers

Project figures

- **Shortening** of delivery times from the point of order to **less than 1 day** in some cases
- **Updating** of products and inventories from checkout or shelf in **less than 5 minutes**

- Leading position in Europe
- 2010 sales: EUR 51 billion
- > 15,000 stores worldwide

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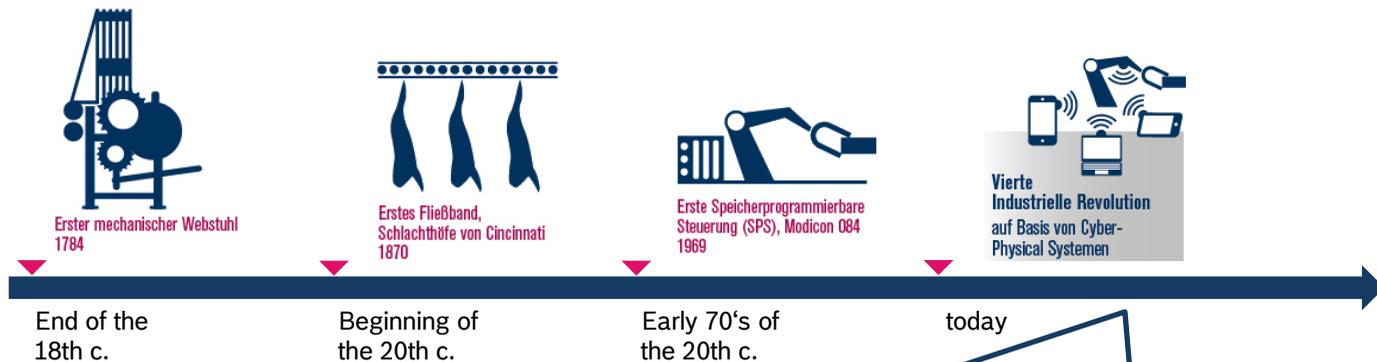
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Industry 4.0 – The next industrial revolution

→ From the 1st to the 4th industrial revolution



- Connecting systems and machines
- Increasing variance with maximum productivity (batch size = 1)
- Decentralization

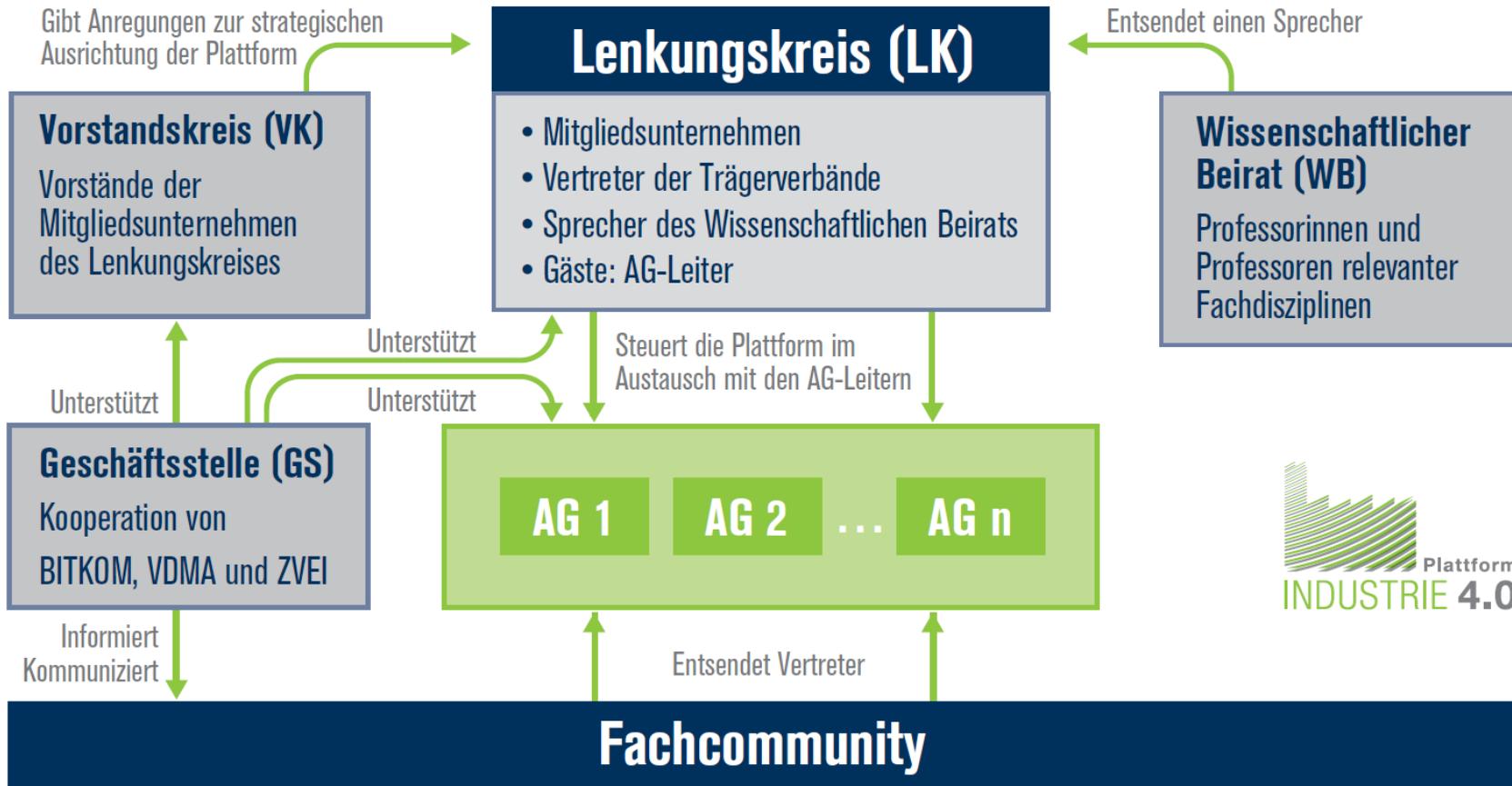
Source: DFKI / Forschungsunion Wirtschaft & Wissenschaft

Industrie 4.0 @ Hannover Messe 2013

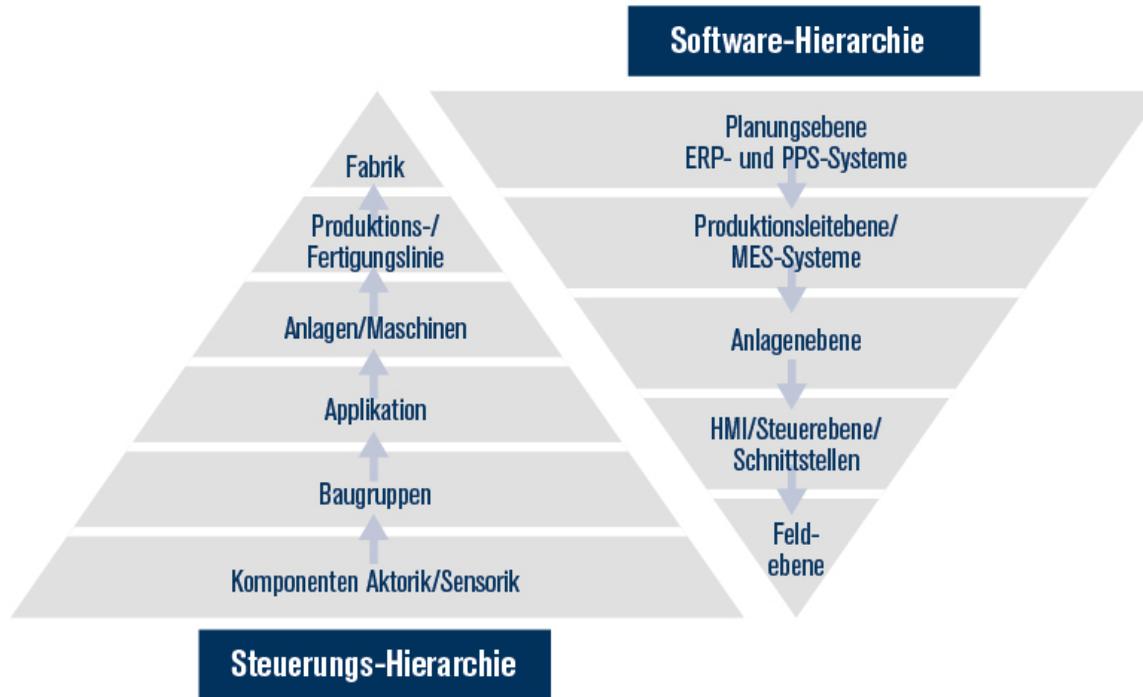


Chancellor Dr. Angela Merkel visiting Hannover Messe with President Vladimir Putin receives the report „Industrie 4.0“ from Prof. Dr. Henning Kagermann (acatech) and Dr. Siegfried Dais (Bosch)

Plattform Industrie 4.0: BITKOM, VDMA, ZVEI



Perspektive der IKT-Automatisierungstechnik heute

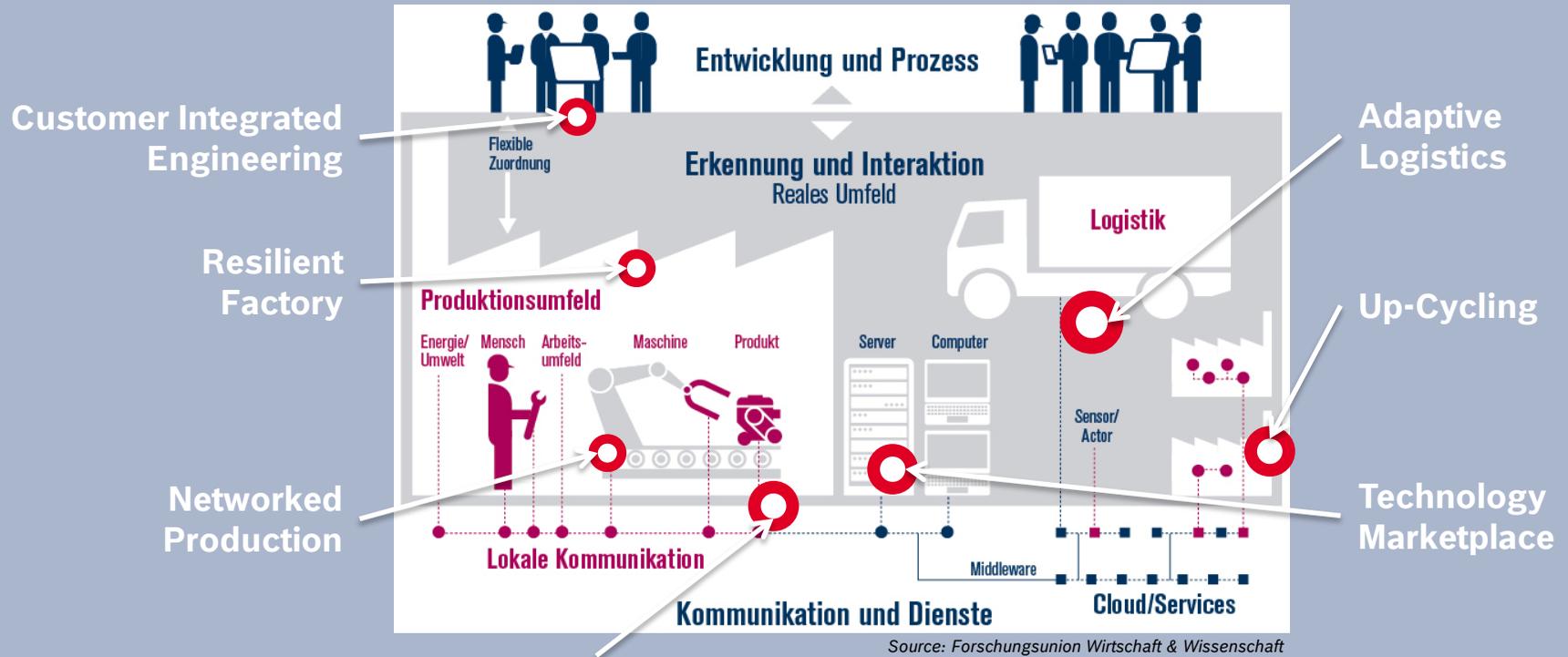


Quelle: Festo 2012

Quelle: Festo / Forschungsunion Wirtschaft & Wissenschaft

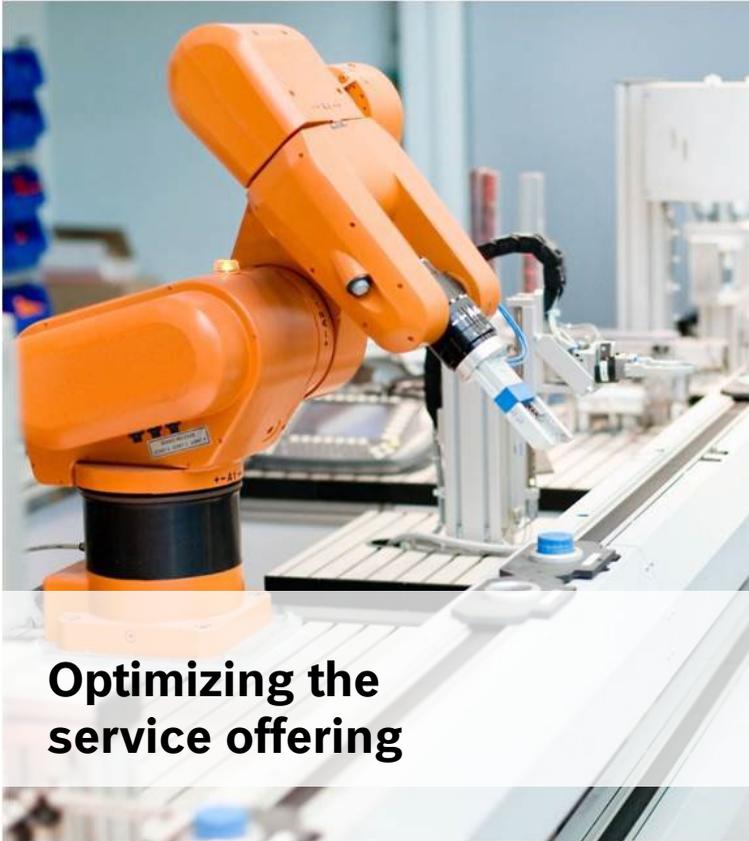
Smart Factory

→ **New business models** through the convergence of IT & production



Predictive Maintenance

Predictive Maintenance

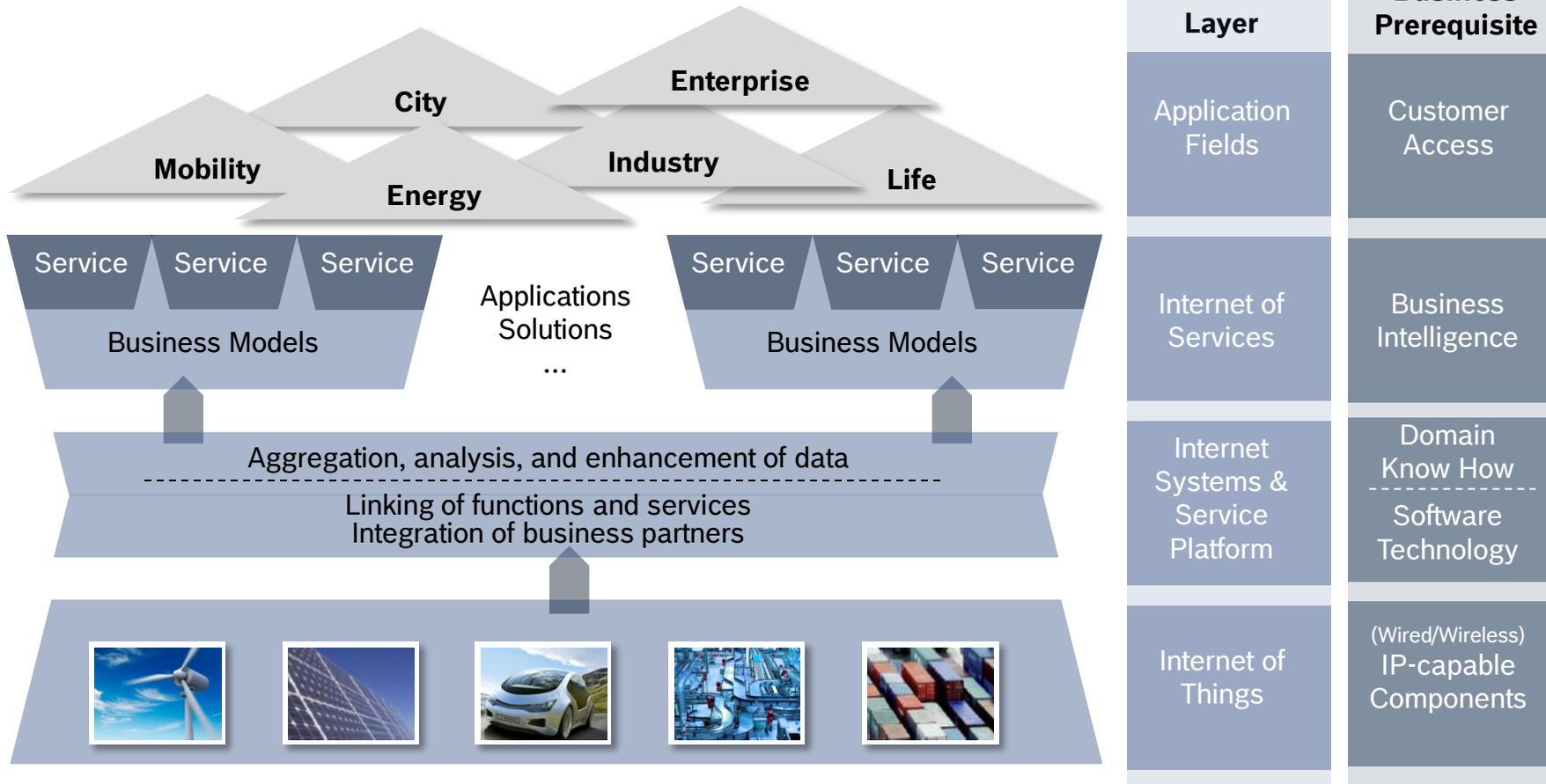


**Optimizing the
service offering**

How it works

- Real-time compilation of machine and sensor data
- Rule-based analysis of machine data to create malfunction prognosis
- Mapping of maintenance processes
- Flexible integration into Business-IT

Reference Model Internet of Things & Services



Conclusion

- The Internet of Things & Services stands for the progressive linking of the physical and virtual world.
- Model driven approach and Open Platforms are key:
Process to Device & Device to Process.
- Technology itself is not the key factor - much more the development of applications and business models.
- **Quick wins in Industrie 4.0 e.g. Predictive Maintenance**
- **Bosch will consequently utilize the chances and possibilities of the Internet of Things & Services.**

