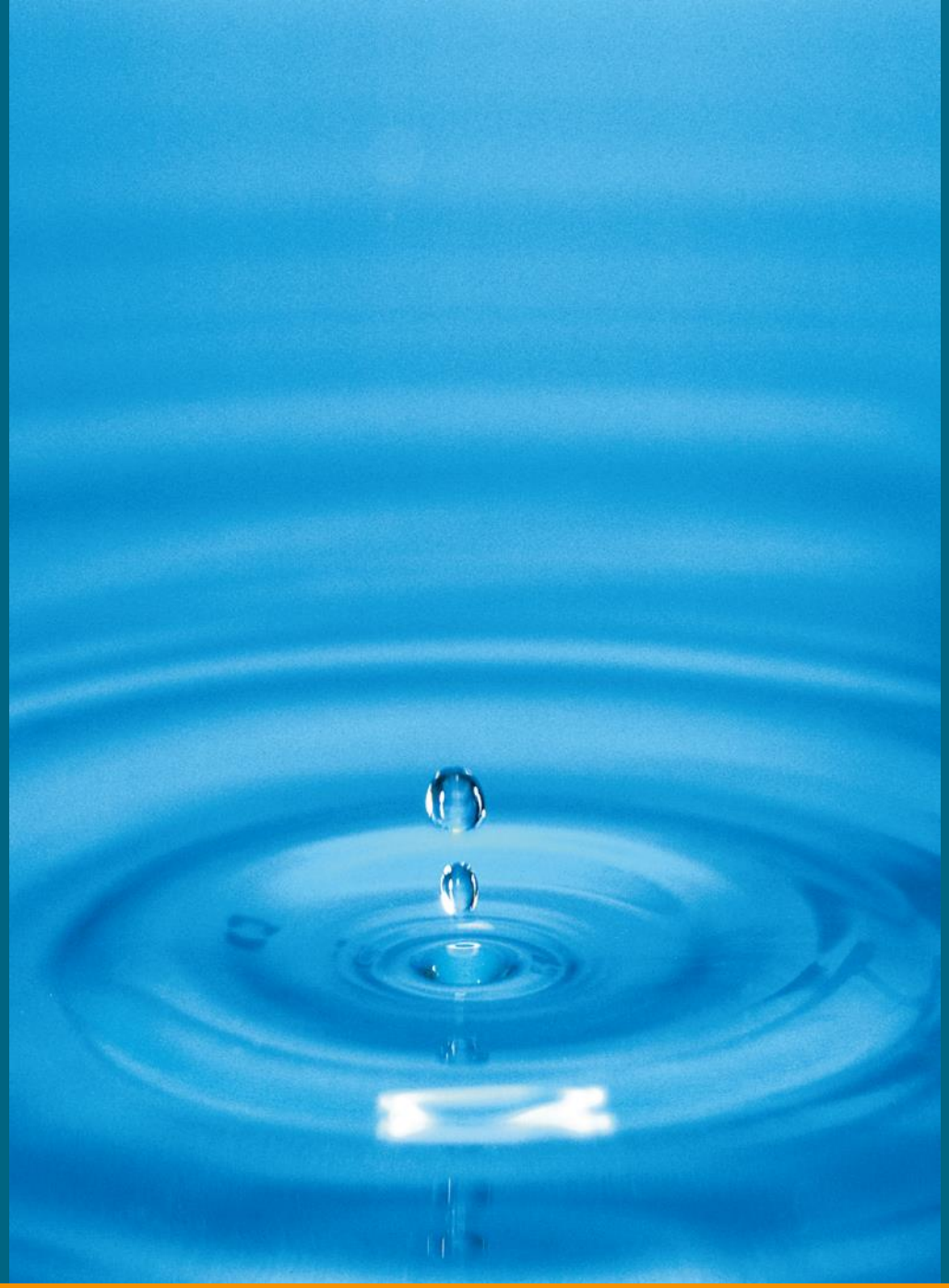


Industrie 4.0 – From Vision To Reality

Manufuture 2015

24 November 2015

Kai Peters
VDMA European Office

Content

- What is Industry 4.0 ?
- Opportunities and risks
- Role of R&I-Programmes
- Political Framework

Industrie 4.0: a German view on a global development

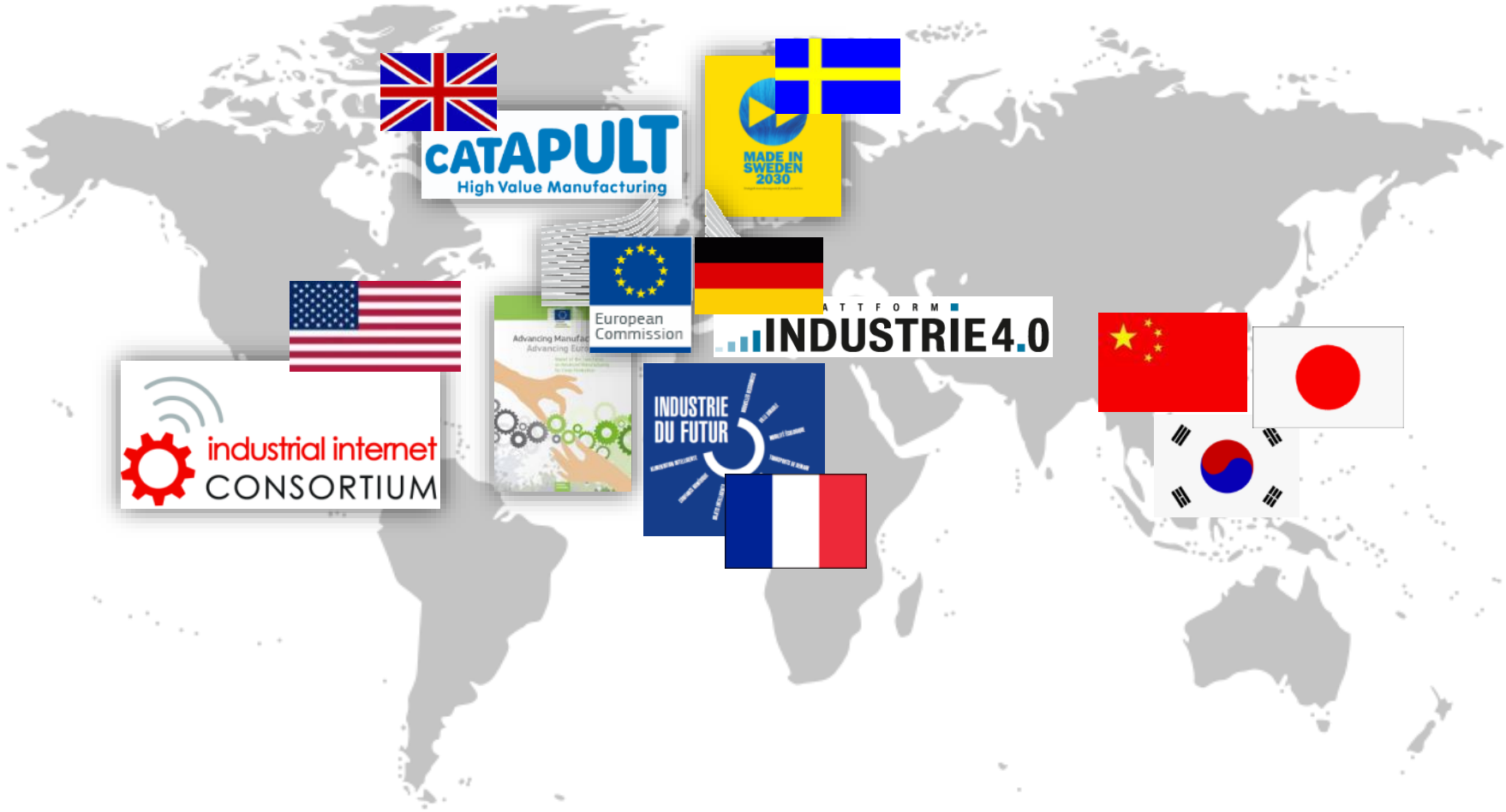


Image based on Prof. Anderl,, TU Darmstadt,

Industrie 4.0 is neither a technology, nor a project....

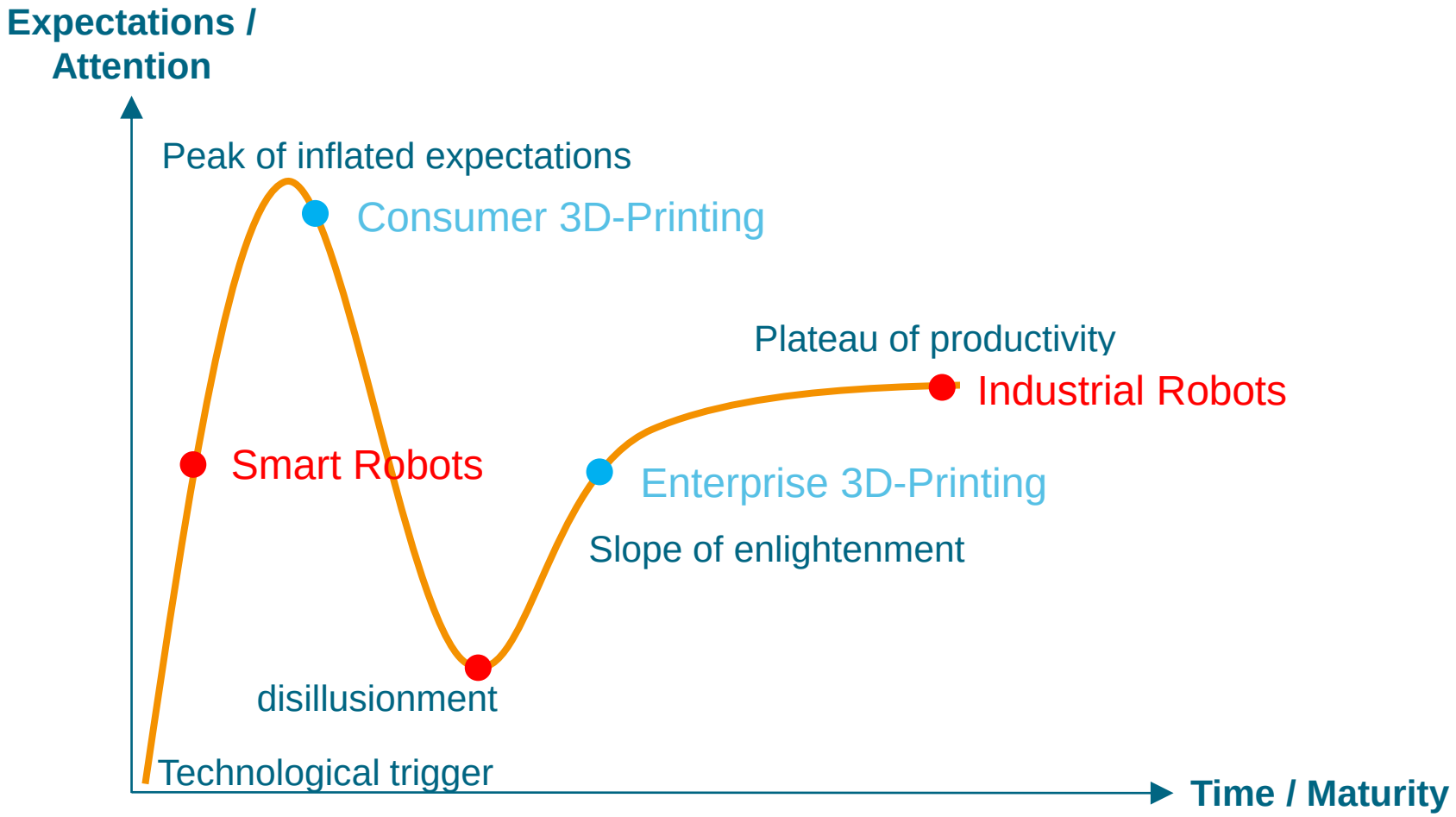
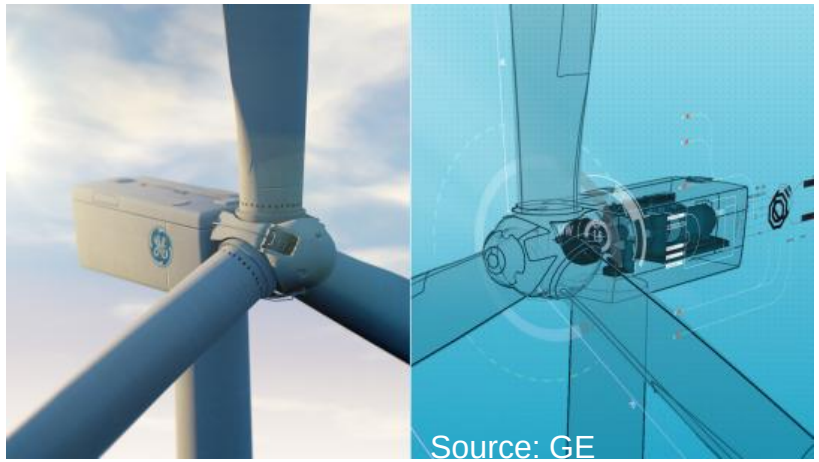


Figure based on Gartner Research 2014

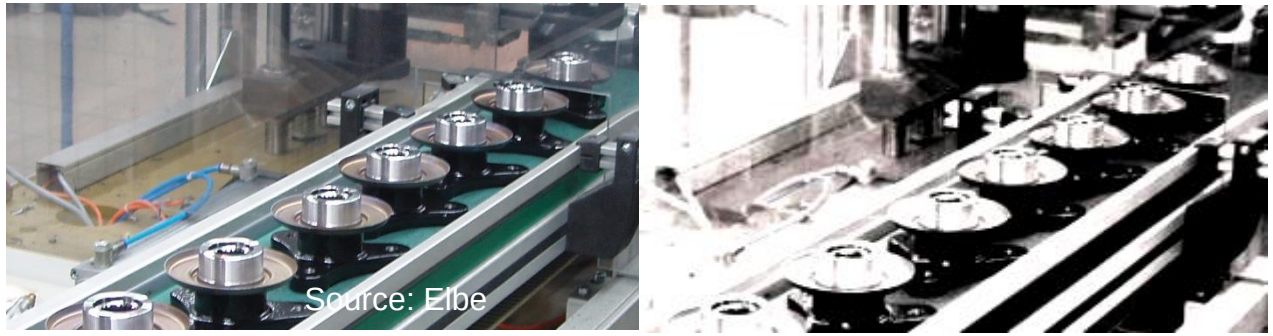
Industrie 4.0 is much more than digitisation....



….promising real-world potentials (Example GE “digital wind farm”)

….with real-world implications (quality, industrial safety, loss of know-how)

…. based upon real production processes



Industrie 4.0: response to new enablers and global challenges

Markets demanding customized products

Resource scarcity, Pressure on Environment

Flexibility

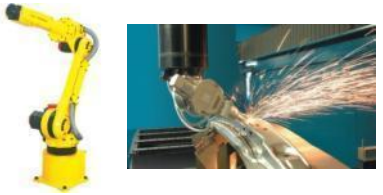
Productivity/Efficiency

Digital Integration/Cooperation of People, Machines, Companies

Virtual Image & Simulation of real processes (“Digital Twin”)

Embedded Intelligence
(Sensors, Actors, Chips)

Data Storage, Computing Power, Data Analytics



Advanced Manufacturing
(3D-printing, Adaptive Production)

Connectivity
(Broadband, Cloud, 5G)

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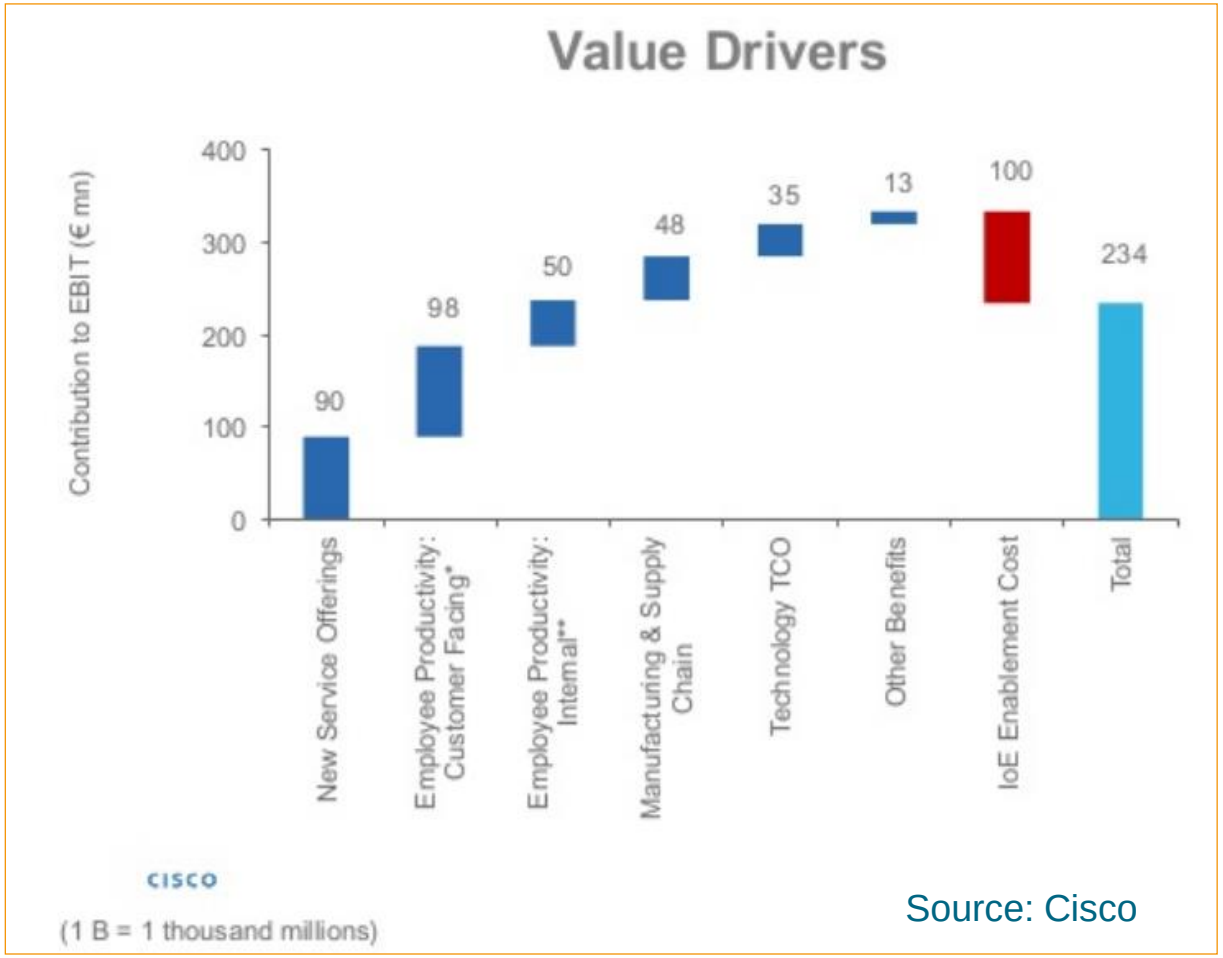
Value drivers: productivity & new business models



Source: Cisco

„Enterprises in Germany expect an increase in productivity of more than 18% by 2020“

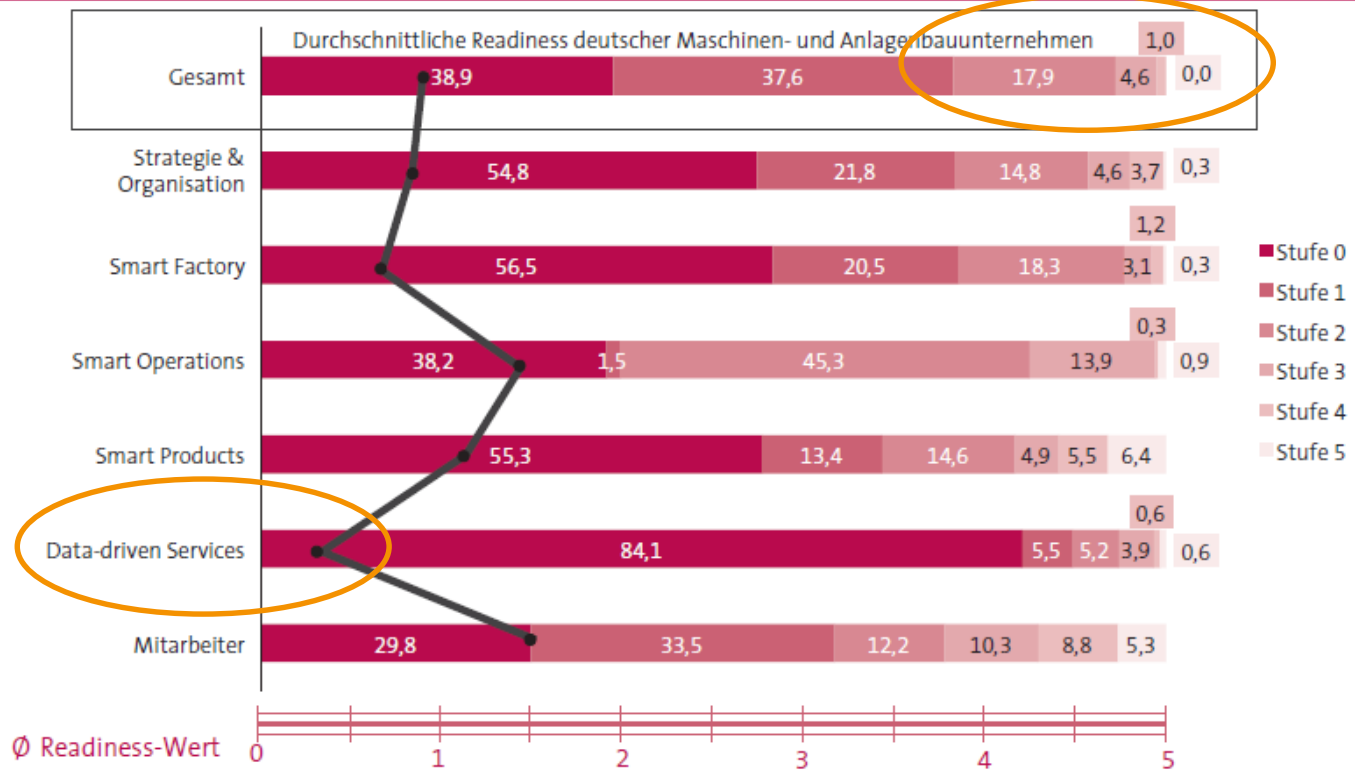
Source: PWC (2014): Industrie 4.0 – die Vierte Industrielle Revolution

„60% of companies expect that turnover will increase due to Industrie 4.0. The potential is seen mainly in new business models, new product/service combinations and better customer relations“

Source: Studie der Impulsstiftung: Studie Industrie 4.0-Readiness

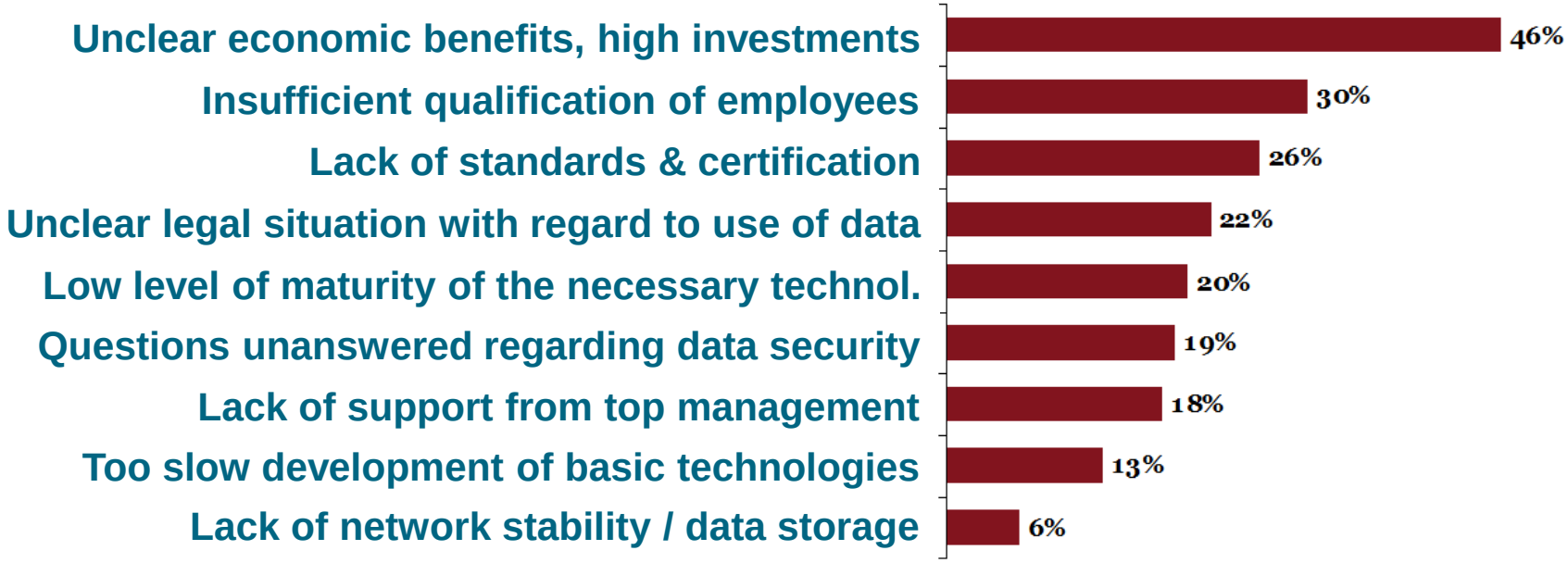
Readiness of Engineering Companies in Germany

Abbildung 3-1: Readiness-Messung



Angaben in Prozent, Angaben für Readiness-Stufen: Skala 0 bis 5;
n=234-268; Berücksichtigt sind nur Unternehmen mit mehr als 20 Beschäftigten.
Quellen: VDMA-Mitgliederbefragung, 2015; IW-Zukunftspanel 2015, 26. Befragungswelle

Pwc-Study (supported by VDMA and Siemens)



Challenges for the successful implementation of industry 4.0

235 companies headquartered in Germany by TNS Emnid from June to September 2014

- Investment in the next 5 years for digitization: 3,5 % of sales / 8,5 bill. Euro p.a.
- Expected sales by digitization: +13,2% / 6,4 Mrd. Euro p.a.

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European Industrial & ICT Research

Markets demanding
customized products

Resource scarcity,
Pressure on environment

adaptive and flexible production

zero-defect

technologies for reconfigurable products

adaption of working environments

new business models

networked production

predictive maintenance

embedded cognitive functions on shop-floor

data intensive processes

Additive Manufacturing Micro-/Nano-production Material Research

Future of Industrial R&I-Programmes: Open questions

- What has to be done in Materials and Manufacturing research ?
- How to address the international dimension?
- Do instruments still match innovation cycles, development speeds and networking needs?
- How to balance the need for pre-competitive research with market uptake-measures?
- What means “pilot line” in digital manufacturing (demonstration, testbeds, validation, transfer)?
- How to support Competitiveness without distorting Competition?

Content

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Playing field: Europe

- **For Industrie 4.0, Europe provides a Single Market and scaling potential**
- **For Europe, Industrie 4.0 is the opportunity to**

  - bring back factories to Europe through efficient and individualised production

  - create investment and business opportunities

  - achieve the re-industrialisation targets in a sustainable way
- **Framework conditions are defined on European level:**

  - Digital Single Market, Internal Market for Goods and Services, Regulatory Framework

  - IPR, Data ownership, Cyber-Secury
- **...but B2B & industrial aspects need more focus!**

Conclusions:

- Industrie 4.0 connects the virtual and the physical world and takes place in industrial value chains.
- It can increase efficiency, competitiveness and create business opportunities.
- Industrie 4.0 is a transition and exploration process with unknown outcome. Networking, learning and flexibility is essential.
- It is already becoming reality, but there is still a long way to go.
- European Research Programmes have played and can still play an important role, but need to be reviewed.

Thank you

Thank you

for your attention!