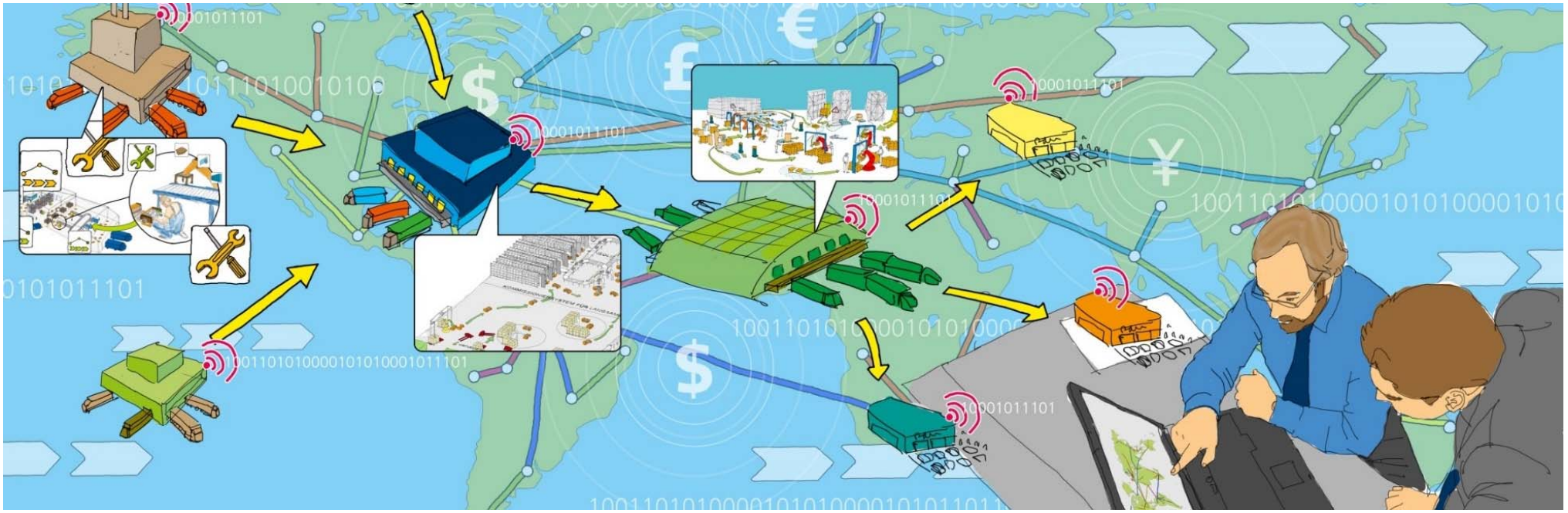
HOW TO SUCCESSFULLY MANAGE INDUSTRY 4.0 ALONG THE SUPPLY CHAIN AND WHAT IT WILL MEAN FOR THE INDUSTRY BY 2035

Professor Dr Michael Henke, Head of Enterprise Logistics, TU Dortmund University and Fraunhofer Institute for Material Flow and Logistics



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Fraunhofer IML

Agenda

- Short introduction of Fraunhofer IML, TU Dortmund and Industrie 4.0
- Managing migration: Systematic implementation of Logistics 4.0 in the company
- Digital refinement of operational processes and the construction of new business models with Logistics 4.0
- Industry trends till 2035
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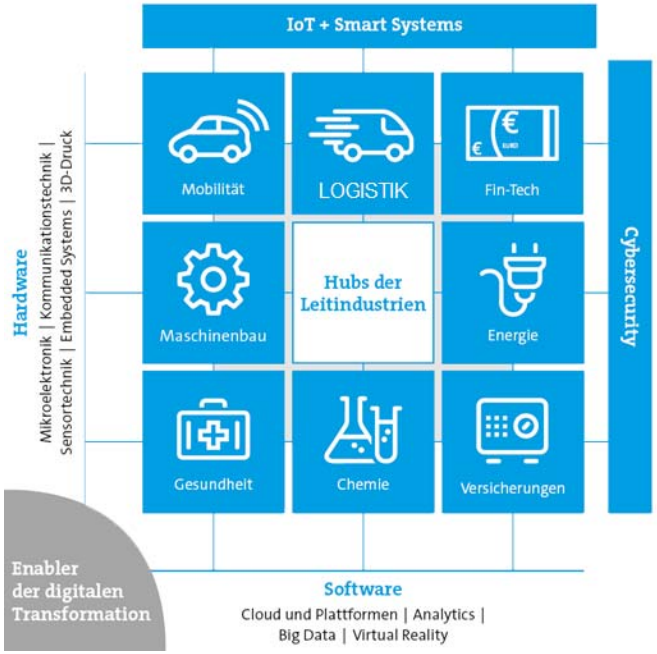
We take part! Dortmund is DIGITAL HUB LOGISTICS.



bitkom

de:hub digital ecosystems

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Data and facts about Fraunhofer Institute for Material Flow and Logistics (IML)

Founded in

1981

260

scientists

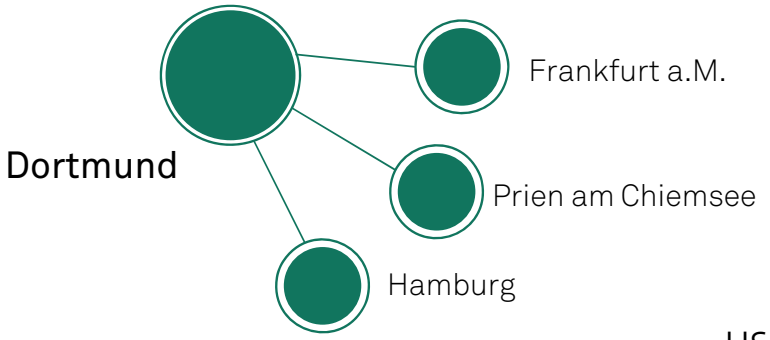
250

PhD candidates and student assistants

Turnover approx.

25m €

More than 50% from industry, trade and service



Cooperations with:

HSG St. Gallen (Switzerland),
Georgia Tech (USA),
Lissabon (Portugal),
Shanghai (China),
Rio de Janeiro (Brasil),
Istanbul und Sabanci University (Turkey),
GSOM (Russia)

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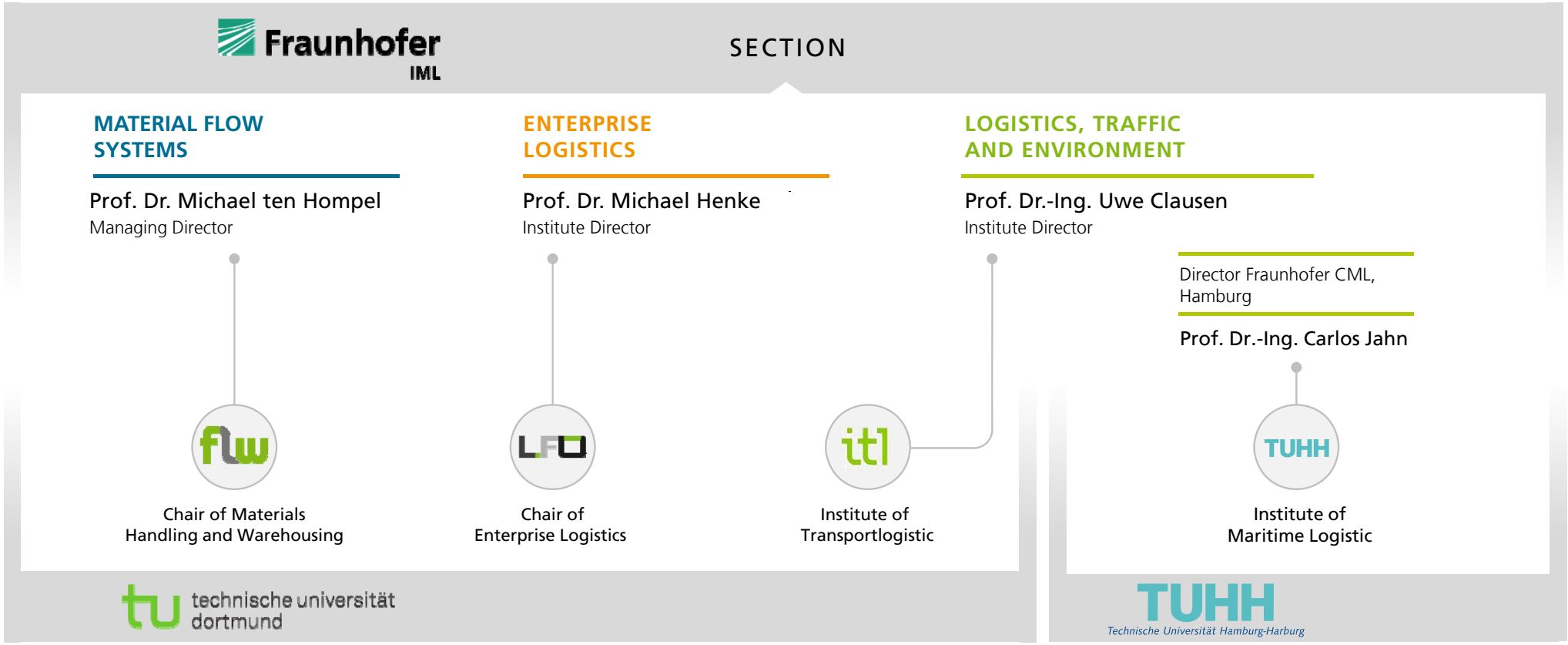
Fraunhofer IML

Fraunhofer Austria Research GmbH

- 100% subsidiary of the **Fraunhofer-Gesellschaft**, founded in 2008
- Division **Production and Logistics Management** in **Vienna**:
  - Excellence in Operations Management: Optimization of industrial value adding processes and structures
- Division **Visual Computing** in **Graz**:
  - Digitalization, Virtualization, Visualization
- 57 employees, 47 scientists (as of 2016)
- Revenue share »Industry projects« 2016: 55%

Organisational Structure Fraunhofer IML and linked chairs



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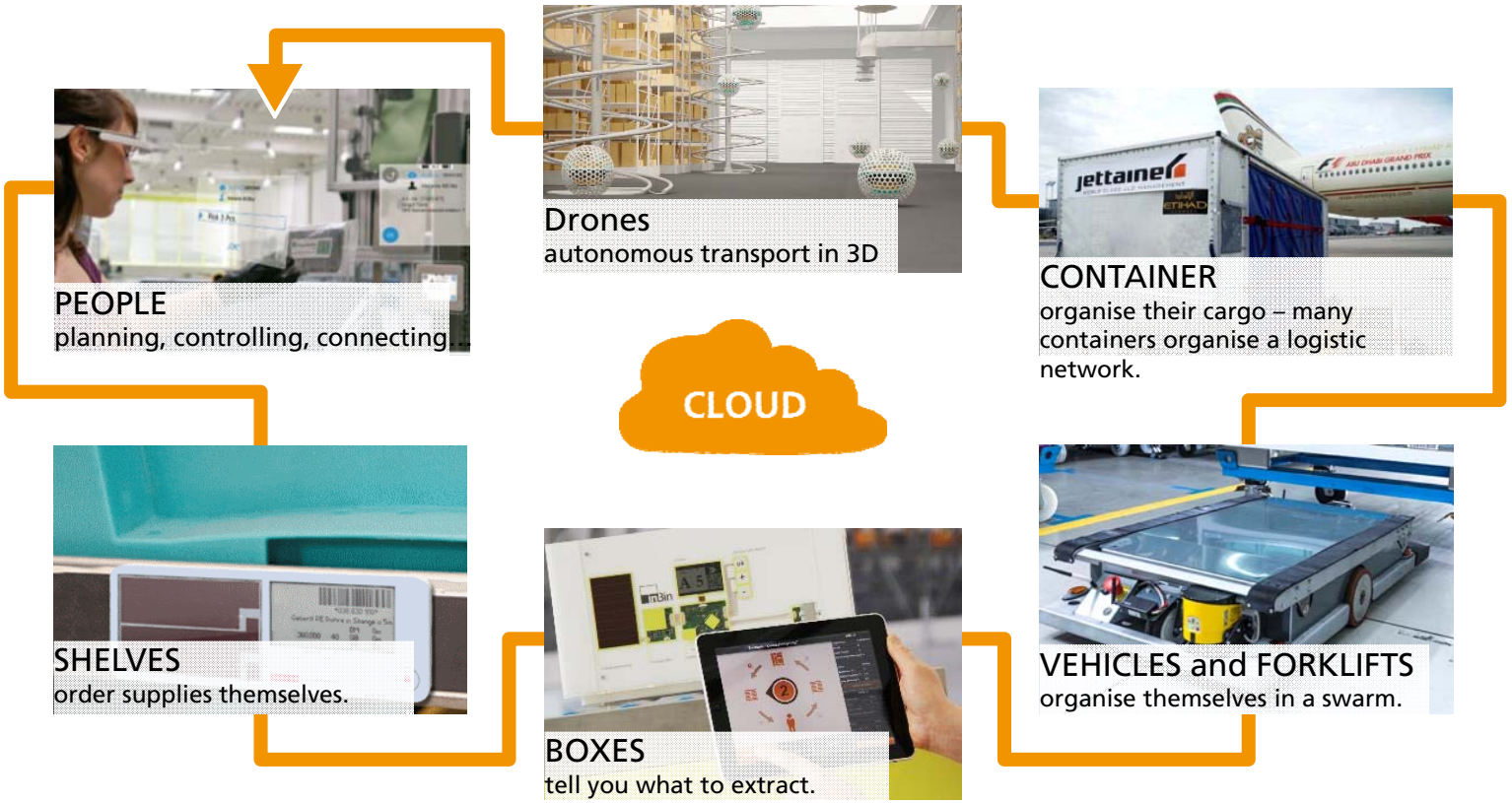
Industrie 4.0 · Internet of things and services · everything becomes autonomous!



Picture source: Fraunhofer IML, Jettainer

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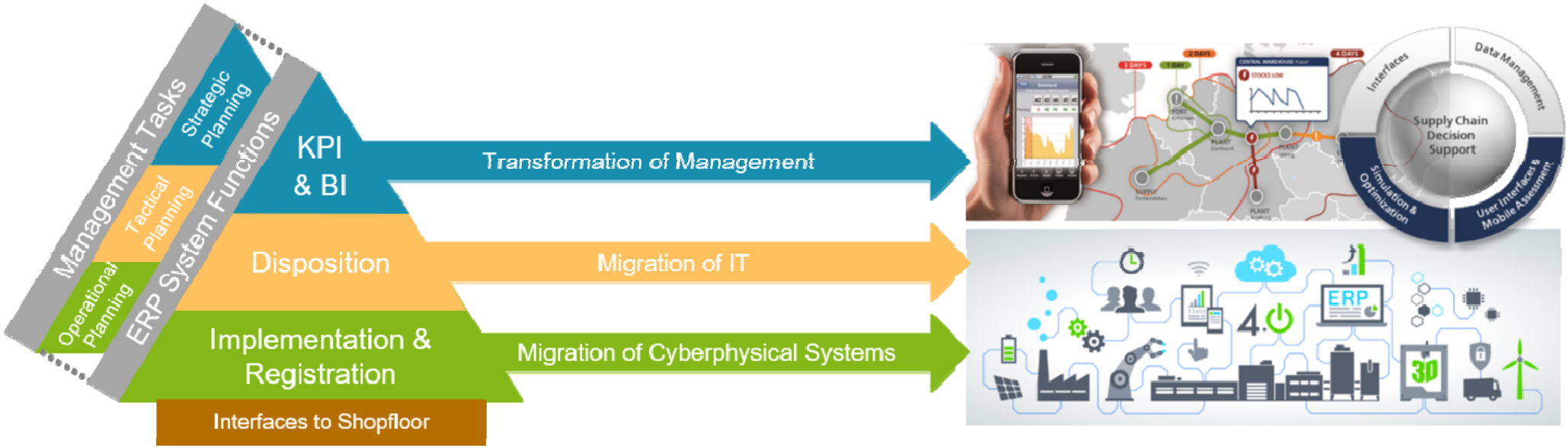
Implementation of Industrie 4.0 by Management 4.0



- Classic pyramid of automation
- Hierarchically organised
- Deterministic
- Adjustment of the system by customizing
- Application specific solution

- Flexible and variable
- Not deterministic
- Highly decentralised
- Multi-agent control
- Cloud-based
- Situation-specific solution

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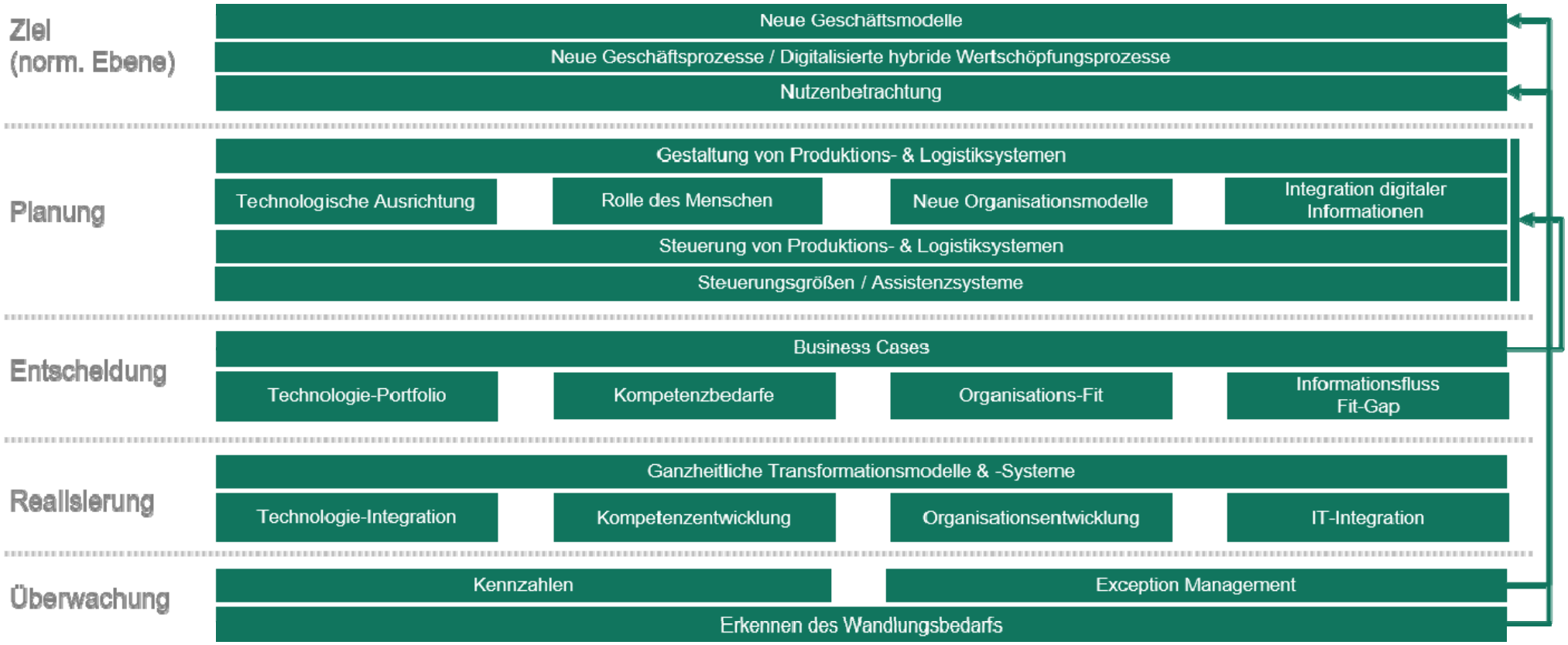
Dortmund's Management Model of Industrie 4.0 (1/3)



work in progress, status: spring 2017

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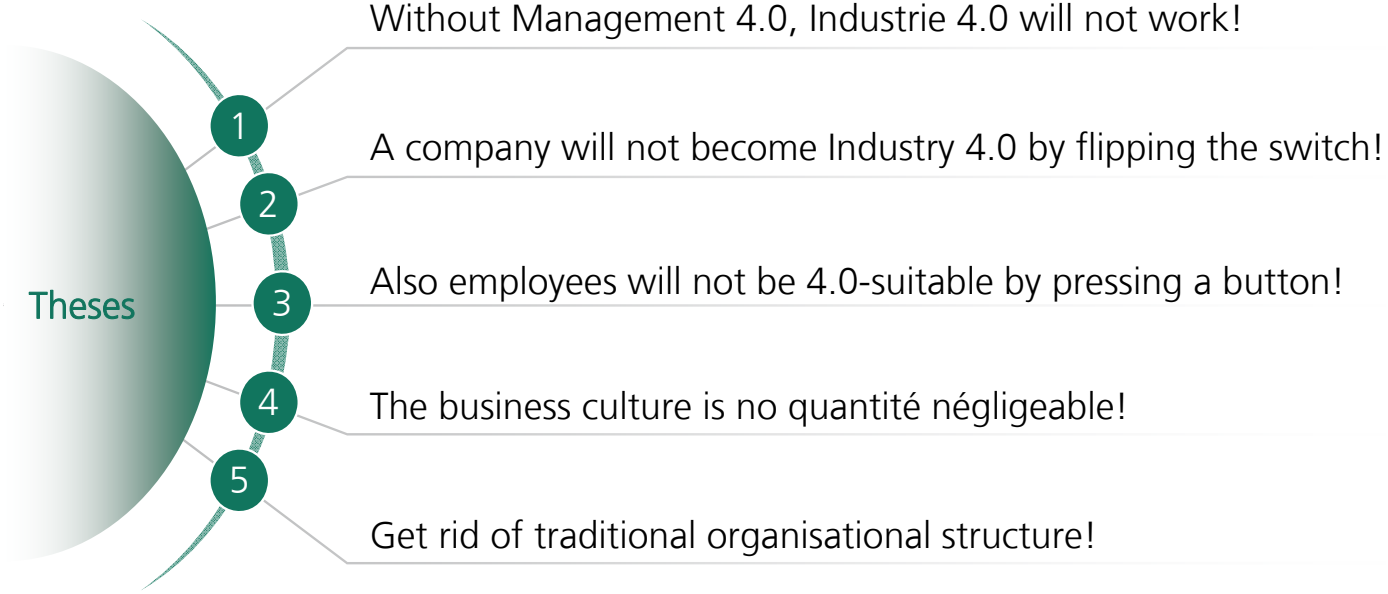
Dortmund's Management Model of Industrie 4.0 (2/3)

10 Theses



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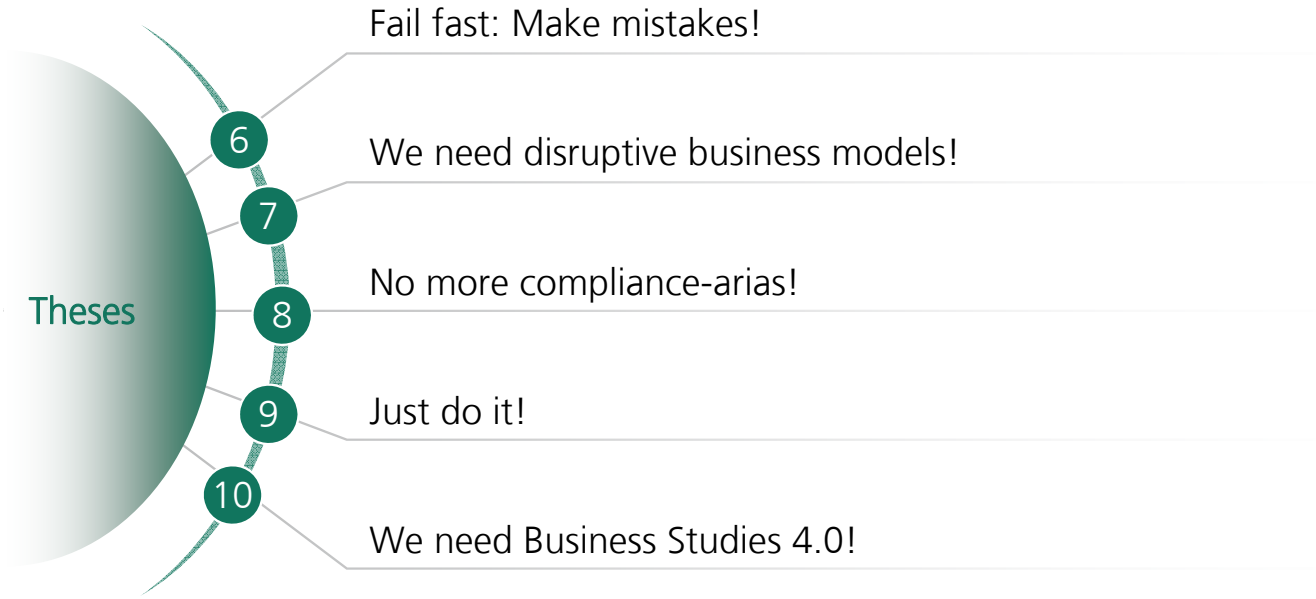
Dortmund's Management Model of Industrie 4.0 (3/3)

10 Theses



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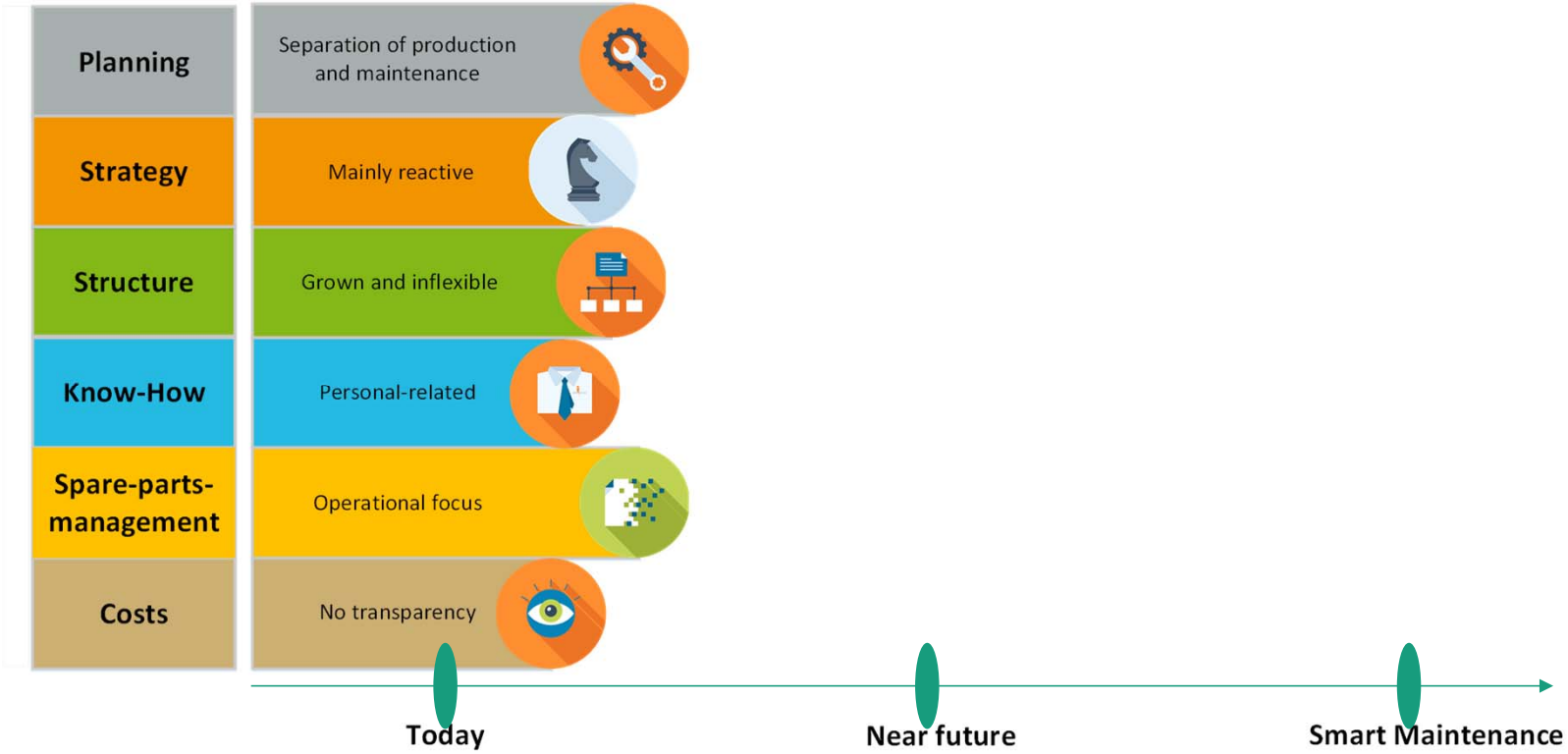
Current challenges – e.g. in the chemical industry
Six central components for the transformation to Industrie 4.0

CASE
PRODUCTION
LOGISTICS AND
MAINTENANCE



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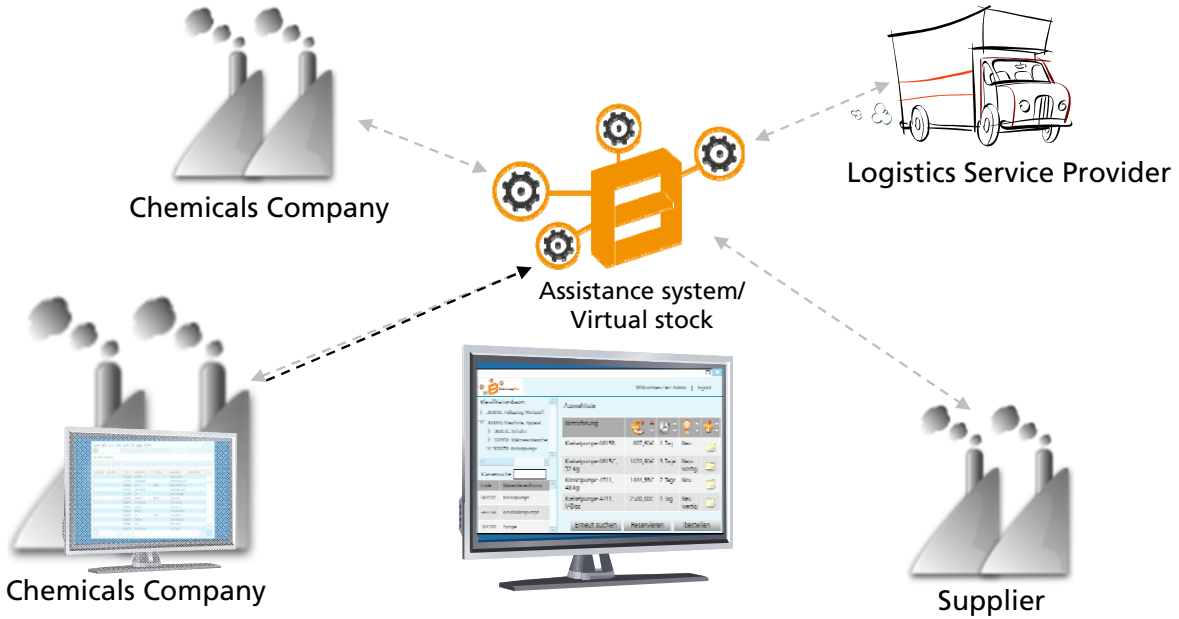
Research Project Chem-log.net
Collaborative Management of Replacement Stocks



Planning	Separation of production and maintenance
Strategy	Mainly reactive
Structure	Grown and inflexible
Know-How	Personal-related
Spare-parts-management	Operational focus
Costs	No transparency

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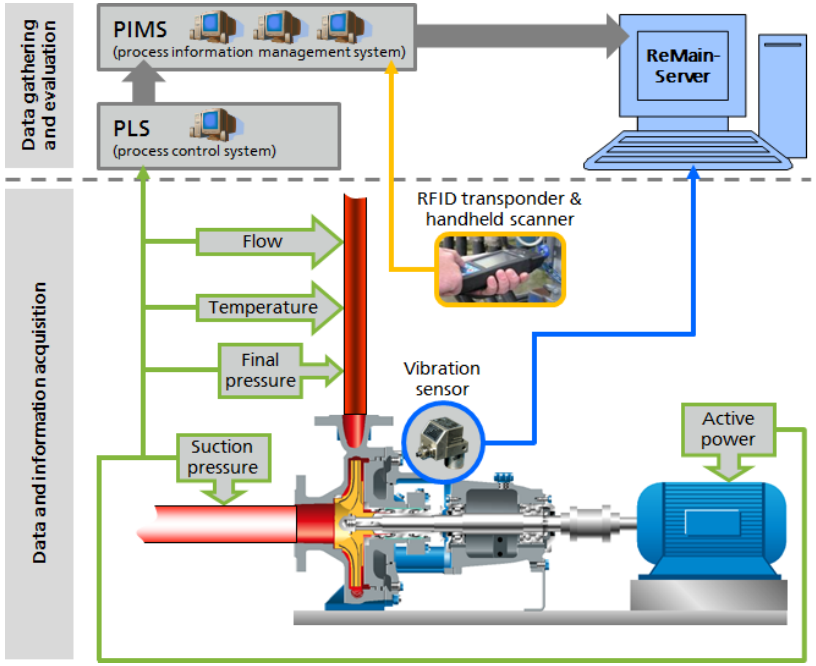
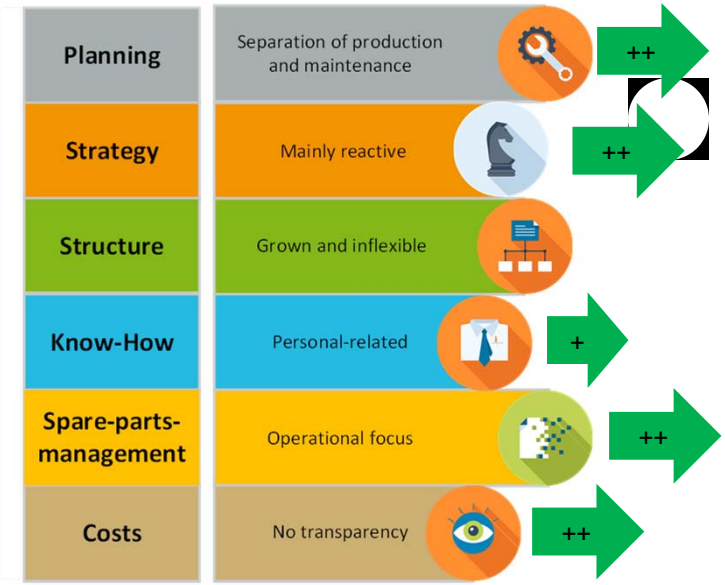
Research Project ReMain
Remaining Lifetime of Pump Systems in the Chemical Industry





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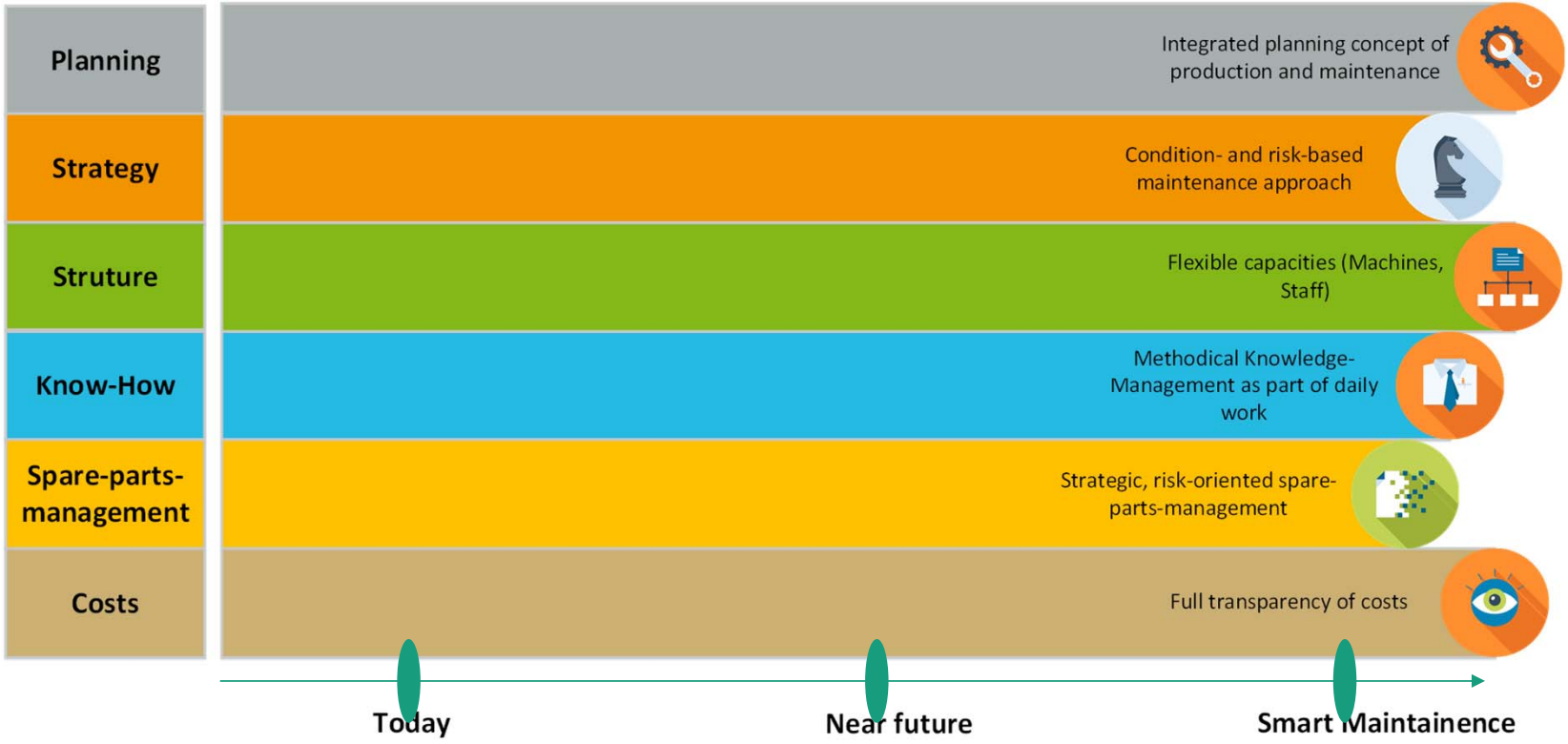
Your Roadmap for the Future
Six central components for the transformation to Industrie 4.0

CASE
PRODUCTION
LOGISTICS AND
MAINTENANCE



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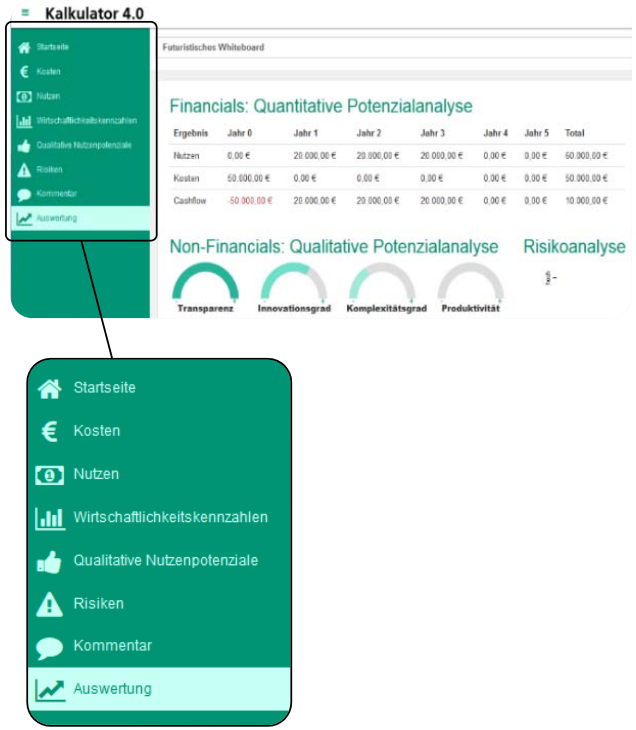
Fraunhofer IML Business Case Calculator
Web Application for the Evaluation of Business Cases



- User-friendly web application
- Step by step guidance through the evaluation process
- Analysis and evaluation of:
  - Investment costs
  - Cost savings
  - Payback period
  - Complexity control
  - Transparency
  - Flexibility
  - Mutability

→ Enables fast and easy evaluation of Business Cases (for example implementation of new technologies)

→ Implementation of a database is conceivable (Benchmark Tool)

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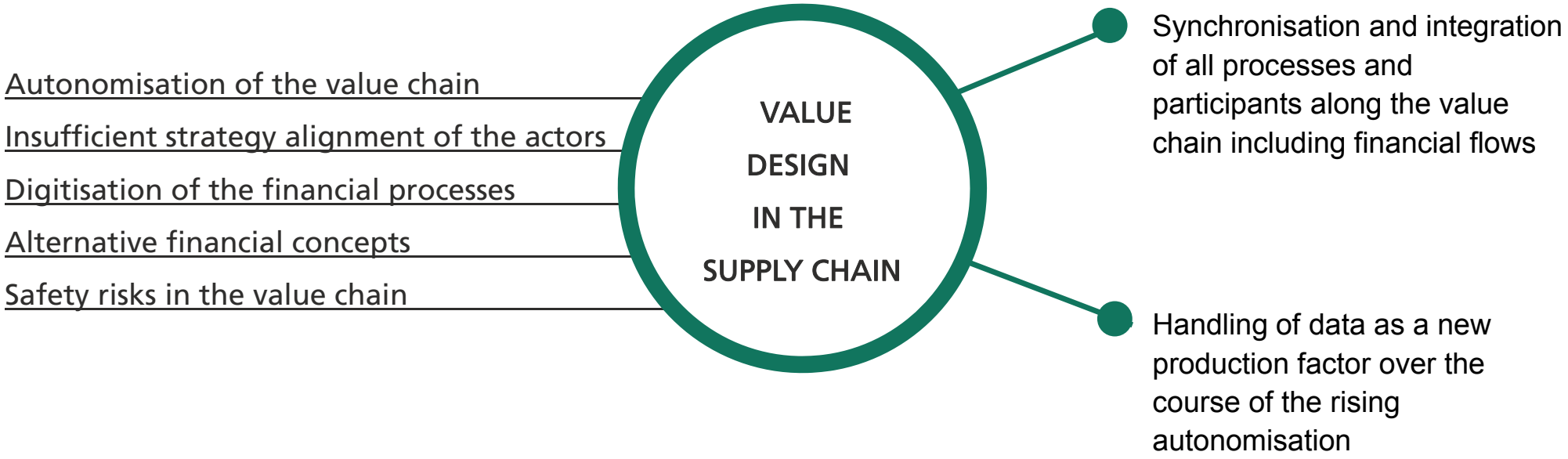
New Value Design in the Supply Chain
Challenges and Trends



Source: Study of HOLM

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Lacking Strategy Alignment of the Actors in the Supply Chain: High Demand for Action regarding Cooperation

VALUE DESIGN IN THE SUPPLY CHAIN

73% of the experts assume that even in 2035 the strategy alignment of the actors in the supply chain will not be sufficient

„The internet of things creates transparency and the supply chain is indented more strongly. The actors need to work together more intensively and need to become more flexible. Cooperation, communication and the exchange of data is essential“

Dr. Klaus Dohrmann, Vice President Strategy and Development, Engineering & Manufacturing Sector, DHL Customer Solutions & Innovation

Source: Study of HOLM

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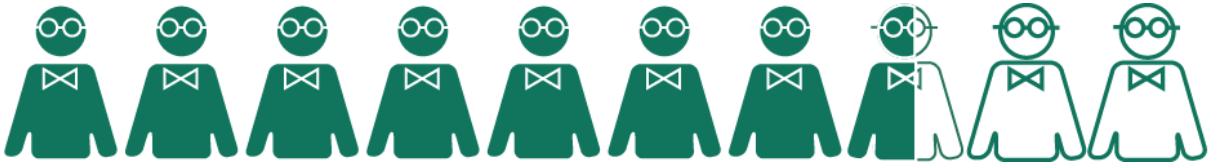
New Concepts for Optimisation and Autonomisation of the Financial Flows establish themselves

VALUE
DESIGN
IN THE
SUPPLY CHAIN



76% of the experts assume that Supply Chain Finance will be standardised and extensively implemented by 2035. It will support particularly SMEs.

80% of the experts think that by 2035 Smart Finance and Payment will be connected to intelligent objects and thus it might be executed autonomously.

Source: Study of HOLM

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Risks of Supply Chains need to be considered more strongly within the scope of proactive Risk Management

VALUE DESIGN IN THE SUPPLY CHAIN

54% of the experts do not think that by 2035 early warning systems and emergency strategies will be developed to the extent that no severe impairments of the supply chain will occur anymore.

„If we cannot get a grip on data security, the fantasy of innovation in logistics and mobility is far more limited."

Dr. Ralph Körfgen, Chairman of the Executive Board, DB Vertrieb GmbH

Source: Study of HOLM

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Dortmund's Management Model of Industrie 4.0

JUST DO IT!

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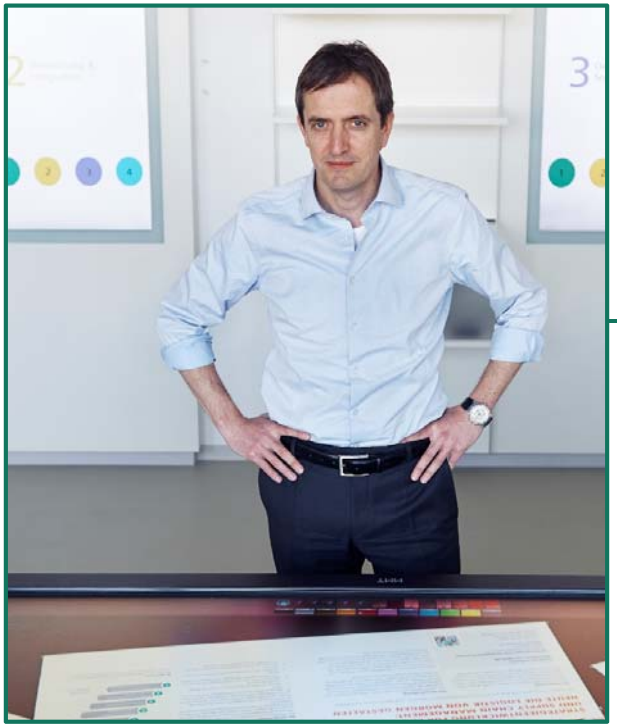

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