Innovative Business Models in the German „Mittelstand“

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- The mission of the MÜNCHNER KREIS is to provide **orientation** for meeting the **challenges** of the digital transformation.
- It serves as an **independent, interdisciplinary, and international platform** for active and **diverse discussions amongst key players** from business, academia, and public policy.
- In our various **activities**, we analyze future developments, providing valuable impulses on the technical, economic, political, and **social challenges of the digital transformation**.

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Agenda

1. What is the Mittelstand?
2. What are Innovative Business Models?
3. Examples in Germany
4. Summary and Conclusions

What is the German Mittelstand?

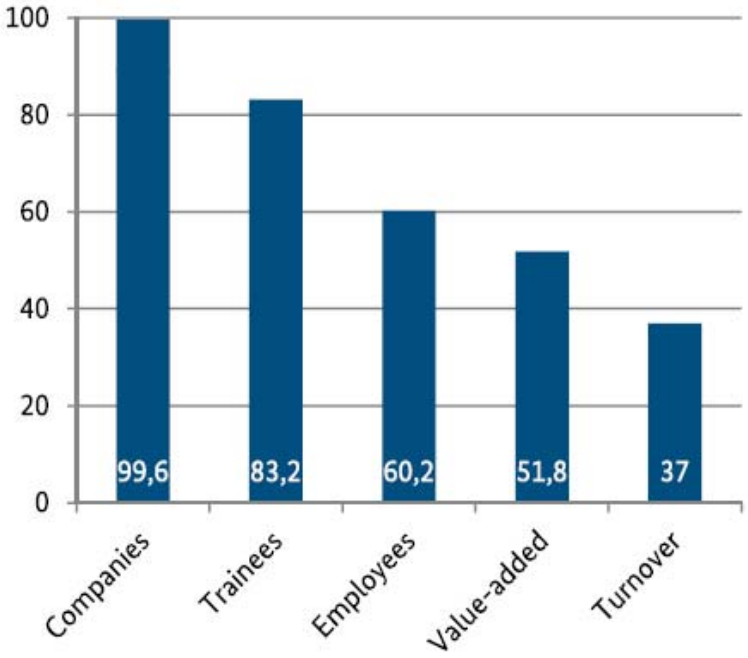
- The ***Mittelstand*** commonly refers to small and medium-sized enterprises in German-speaking countries, especially in Germany, Austria and Switzerland
- Mittelstand firms are usually defined as enterprises with annual revenues of up to 50 million Euro and a maximum of 500 employees.

The Importance of the German Mittelstand

- More than **99% of all German firms** belong to the “German Mittelstand”.
- Almost all of Germany’s Mittelstand are **family-owned**, many are managed by their owner, and their business policies tend to be especially long-term.
- Characteristics:
  - Family ownership or family-like corporate culture with generational continuity
  - Long-term focus
  - Investment into the workforce
  - Lean hierarchies
  - Innovativeness
  - Customer focus
  - Social responsibility
  - Strong regional ties

The Mittelstand is the backbone of the German Economy

Proportions accounted for by the German Mittelstand
Percentages, 2010/2011 figures

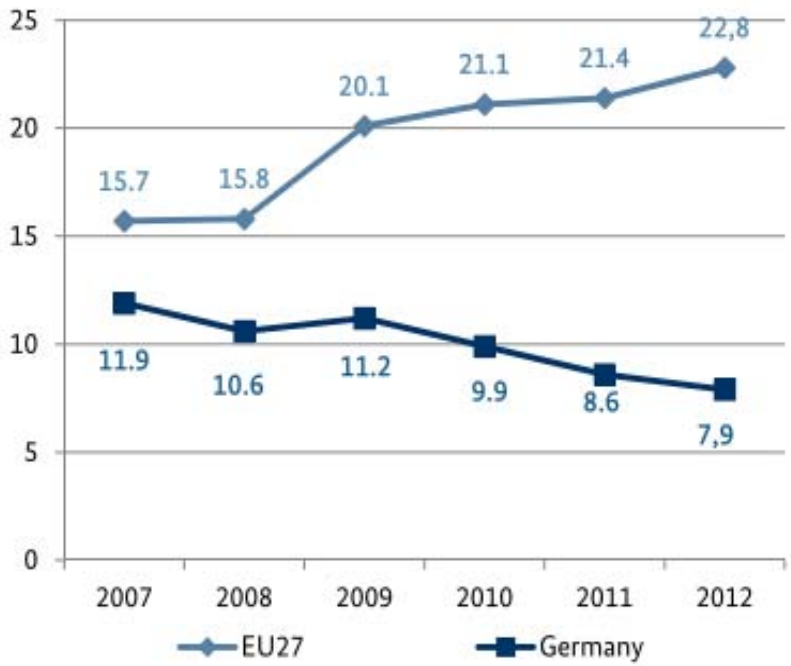


- 99.6% of all companies
- 60.2% of all employees
- 52% of the value-added
- 37% of turnover

Source: Federal Ministry of Economics and Technology,
German Mittelstand: Engine of the German economy

Youth Unemployment is Low due to “German Mittelstand”

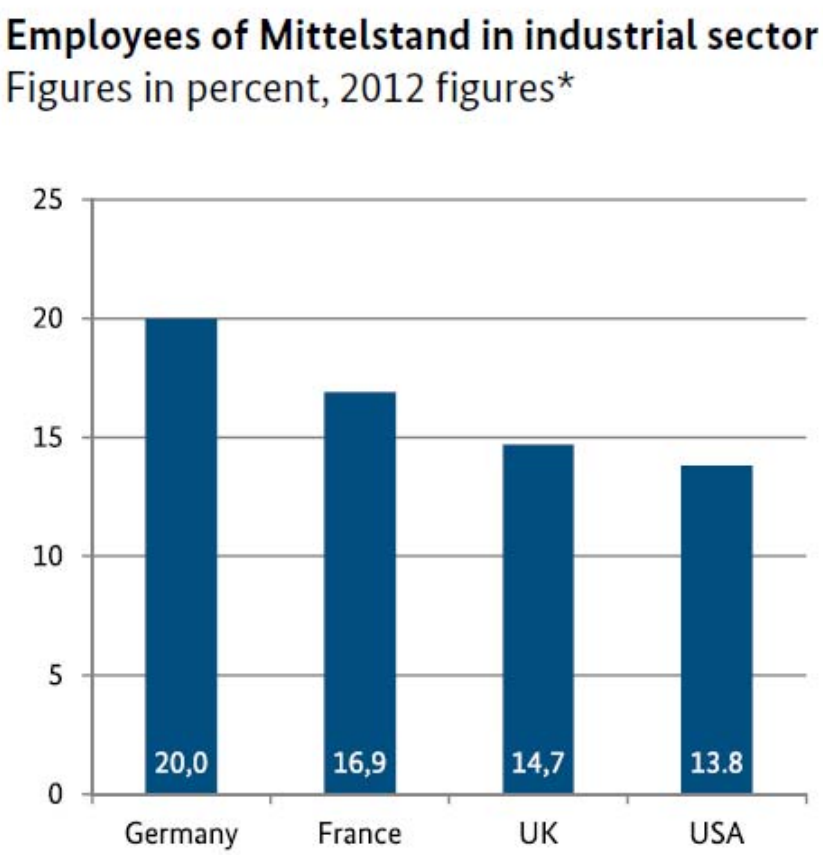
Youth unemployment in the international comparison
Percentages



- 83.2 of all trainees
- Reduced unemployment levels
- Apprenticeship system is a model around the world

Source: Federal Ministry of Economics and Technology, *German Mittelstand: Engine of the German economy*

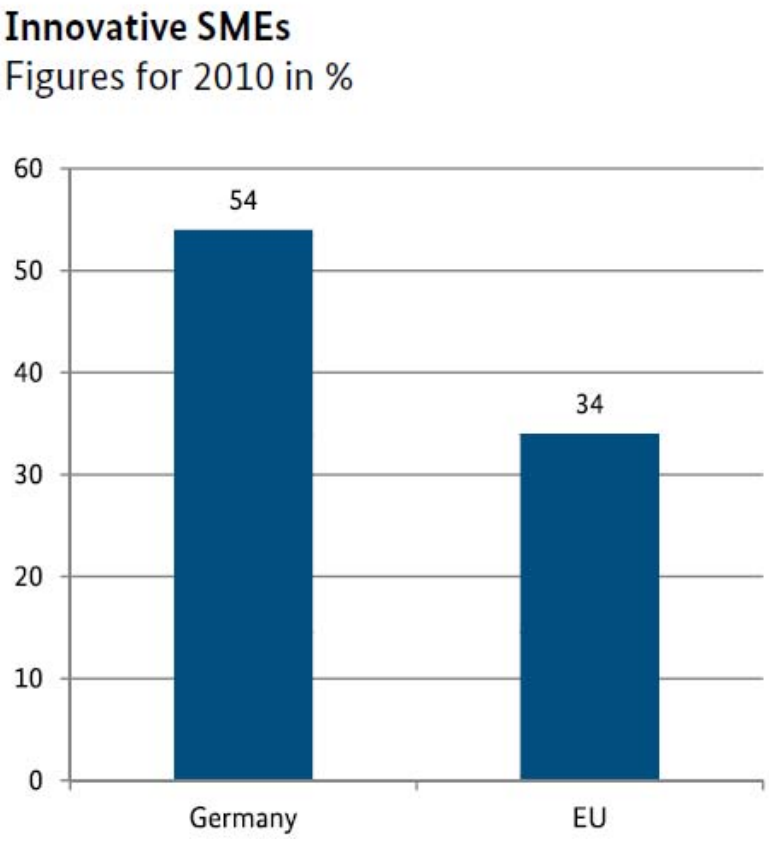
The Mittelstand is strong in manufacturing.



- Mittelstand is very important in the manufacturing sector
- Mittelstand companies are global players

Source: Federal Ministry of Economics and Technology, *German Mittelstand: Engine of the German economy*

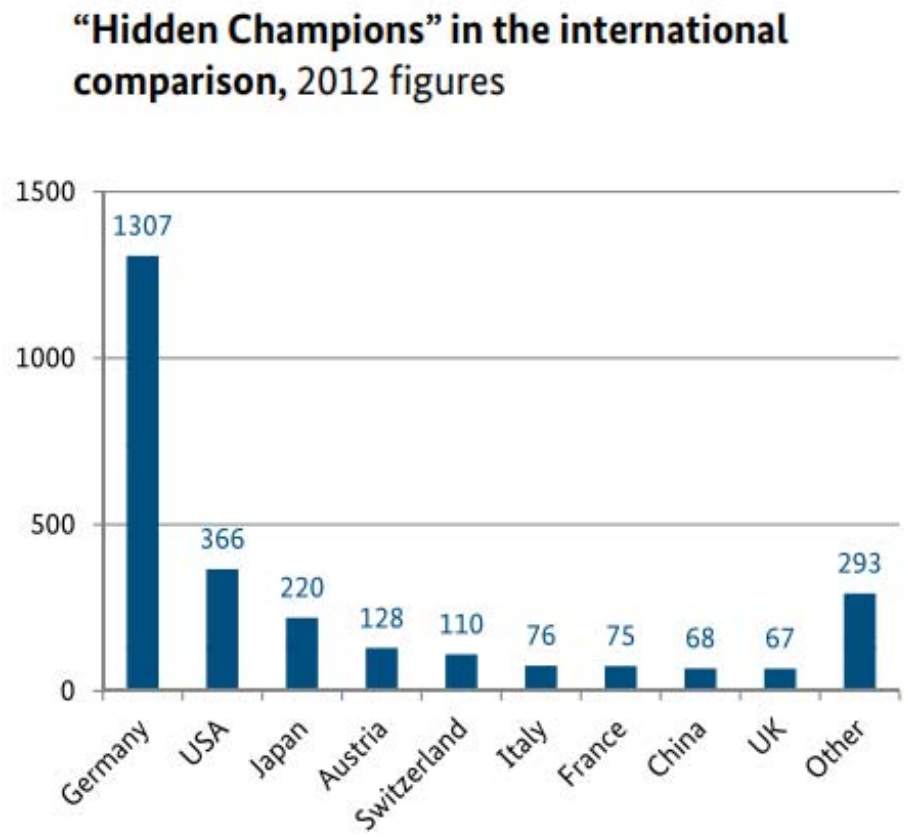
The Mittelstand is very innovative!



- 54% of Mittelstand companies have brought new products or process to the market in the last two years.
- Mittelstand companies spend significantly on R&D

Source: Federal Ministry of Economics and Technology, *German Mittelstand: Engine of the German economy*

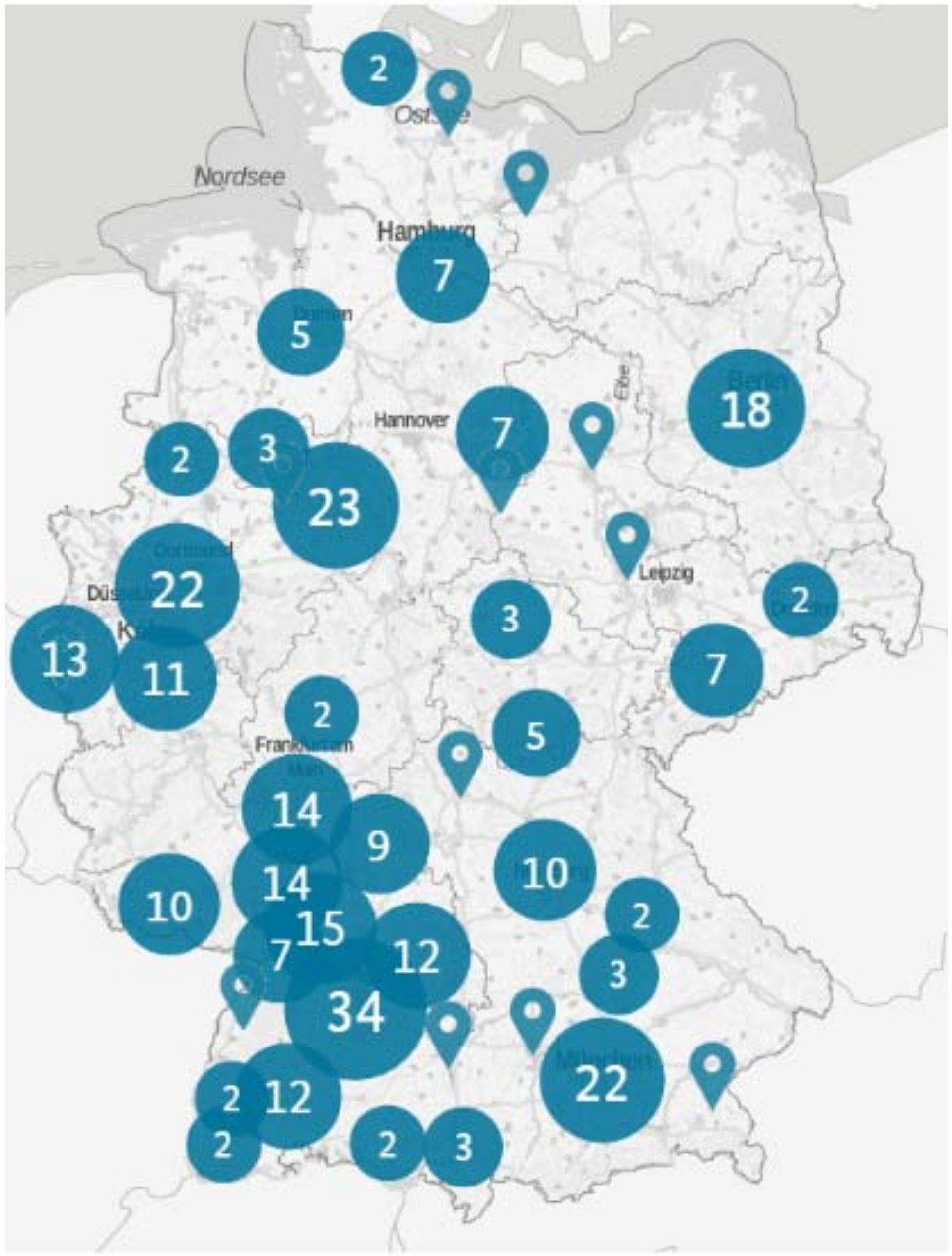
The Hidden Champions of Germany



- Germany´s Mittelstand has „Hidden Champions“ with niche products serving world markets.
- Especially strong in manufacturing industries.

Source: Federal Ministry of Economics and Technology, *German Mittelstand: Engine of the German economy*

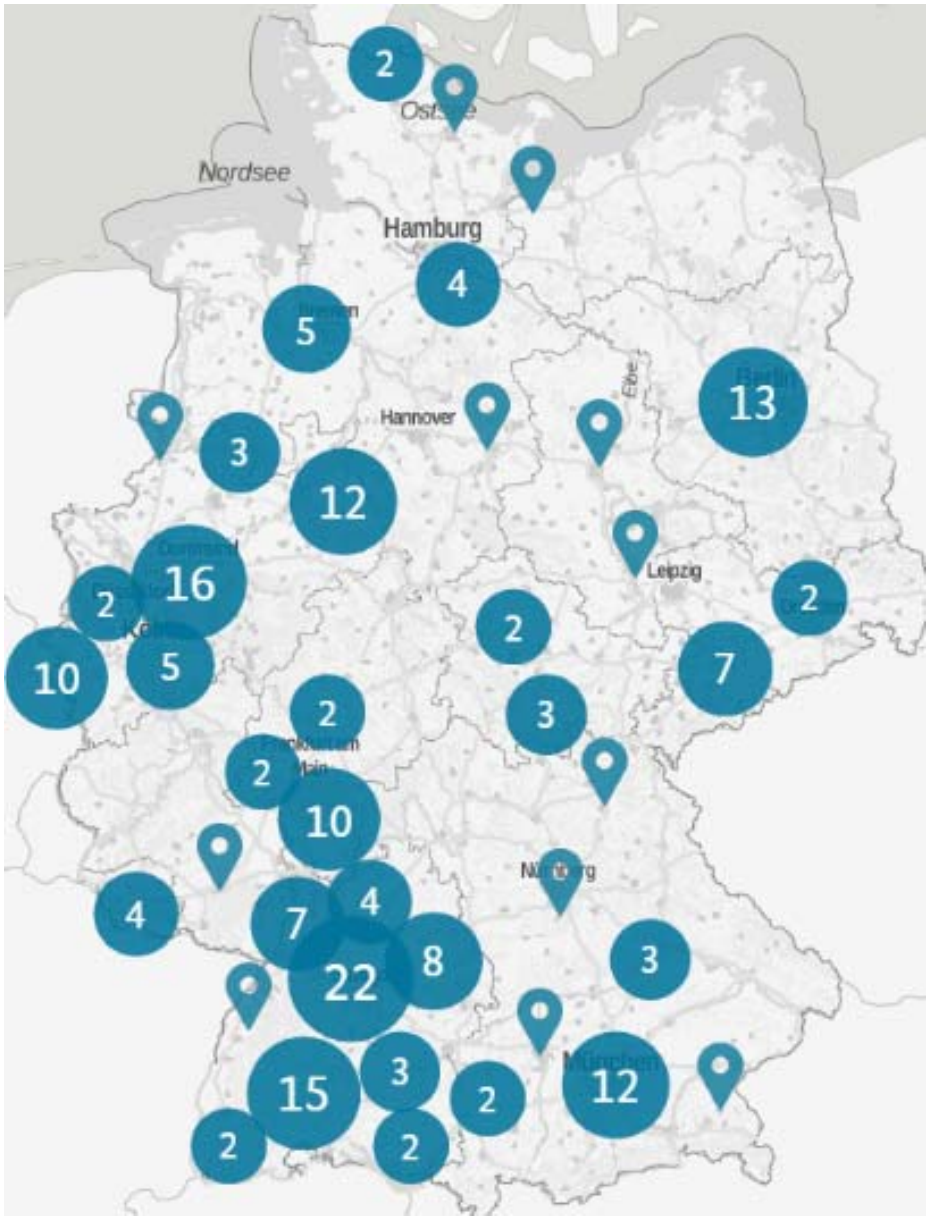
The Mittelstand and Industrie 4.0



- **A map of Industrie 4.0 shows 317 projects in Germany ….**

Source: http://www.plattform-i40.de

The Mittelstand and Industrie 4.0



…and 196 (62%) are in companies with less than 5000 employees.

Source: http://www.plattform-i40.de

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Business Model Patterns

Changes in Business Models over Time

Internet as Business Infrastructure

- E-Commerce
- Freemium
- Customer Data
- Open Source
- Digitalization

Internet as Social Media

- User Designed
- Crowdsourcing
- Crowdfunding
- Long Tail
- Open Source

Internet of Things

- Digitally Charged Products
- Physical Freemium
- Digital Lock-in
- Product via Pay per Use
- Remote Usage Monitoring
- Preventive Maintenance

1995 **2005** **2015**

Source: Fleisch/Weinberger/Wortmann 2014

Technologies will Shape the Transformation of Business Models for Industrie 4.0

Technology Fields

- Data, Computing Capacity, Networks
- Analytics and Artificial Intelligence
- Human-Machine Interaction
- Robotics and Additive Manufacturing

Anticipated Business Models

Value as a Service: pay-by-usage services to satisfy needs	BM based on **process and status data** from production/product
Platform as a Service: for the development of software-, hardware, service modules	BM through **intelligent networking** of the market players
Infrastructure as a Service: Infrastructure landscape as the basis for platforms	**Digital refinement** of products and services

Emmrich et al. 2015; Becker/Knop 2015; Plattform Industrie 4.0 2016; BITKOM 2016; McKinsey & Company 2015

Digital Enhancement of Existing Product

Ibin Optical Ordering System:

the quantity, number, and ordering information for the bolts can be obtained via the built-in camera; this is then transmitted to the ERP system and more bolts are ordered automatically.

Source: https://www.wuerth-industrie.com

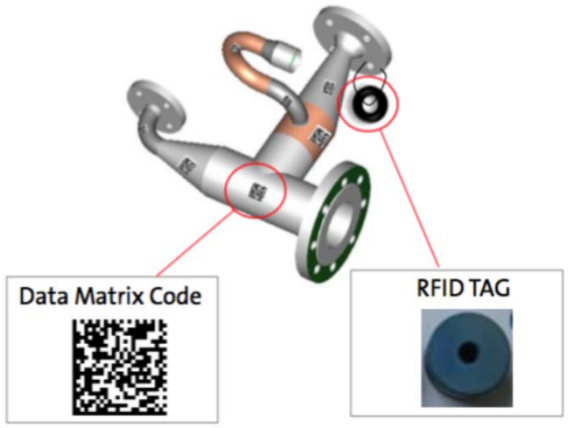
Digital Enhancement of Existing Products

Krones AG in Regensburg: Barcodes and RFID Tags on Products

Production data

Material data:
- Material number
- Parts list

Production program data:
- Temperature
- Machine Data



Order data

- Order number
- Batch number
- Work plan
- Assembly sequence

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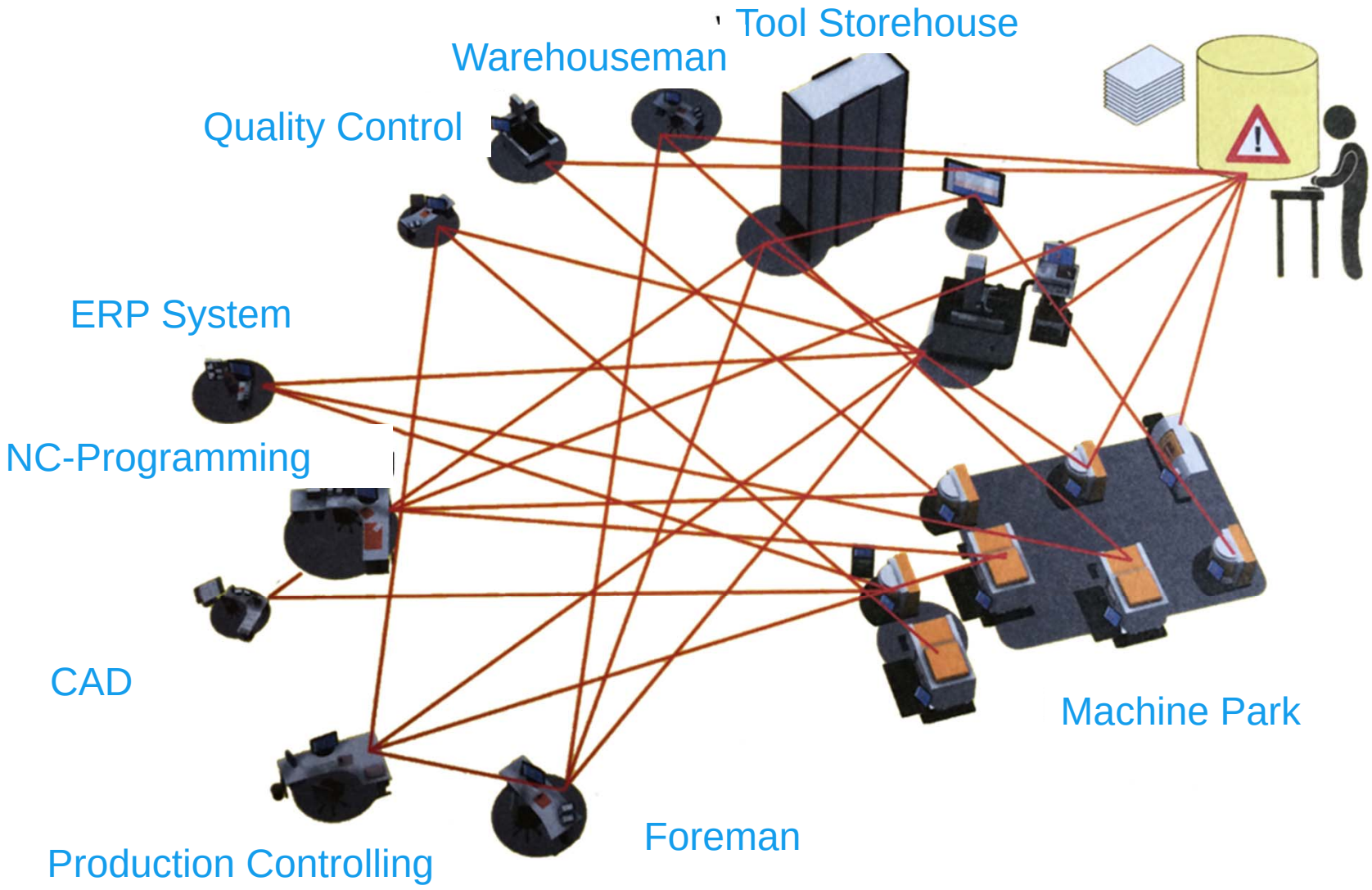
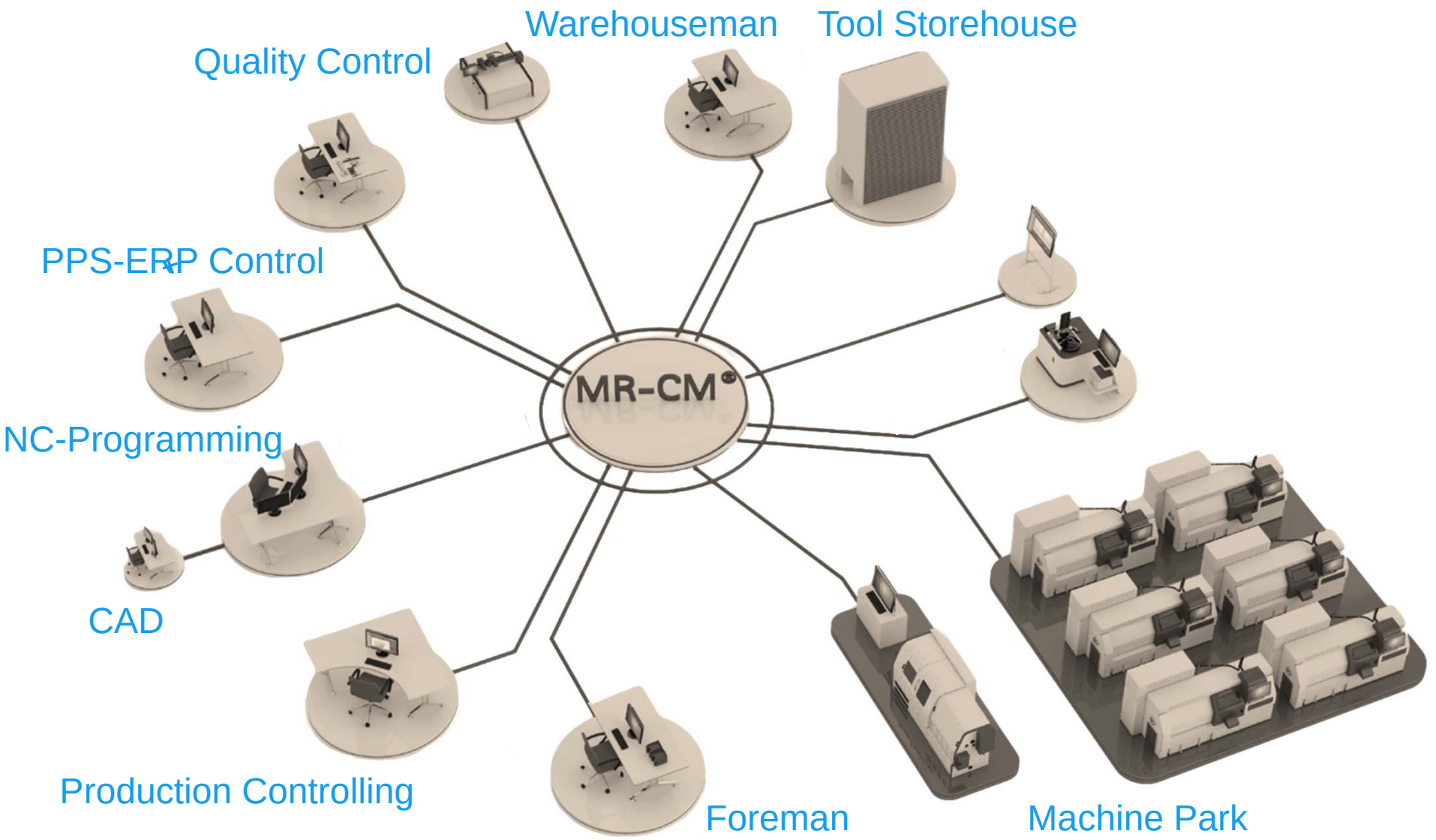
Process and status data from production/product

- Family-owned firm founded in 1868 in Regensburg (Bavaria), Germany
- Hidden champion in high voltage technology (On-Load Tap-Changer)
- Machining processes (turning, drilling, milling)
- 2700 employees
- Turnover: 630 Million €
- Awarded the first German Industrie 4.0 Award

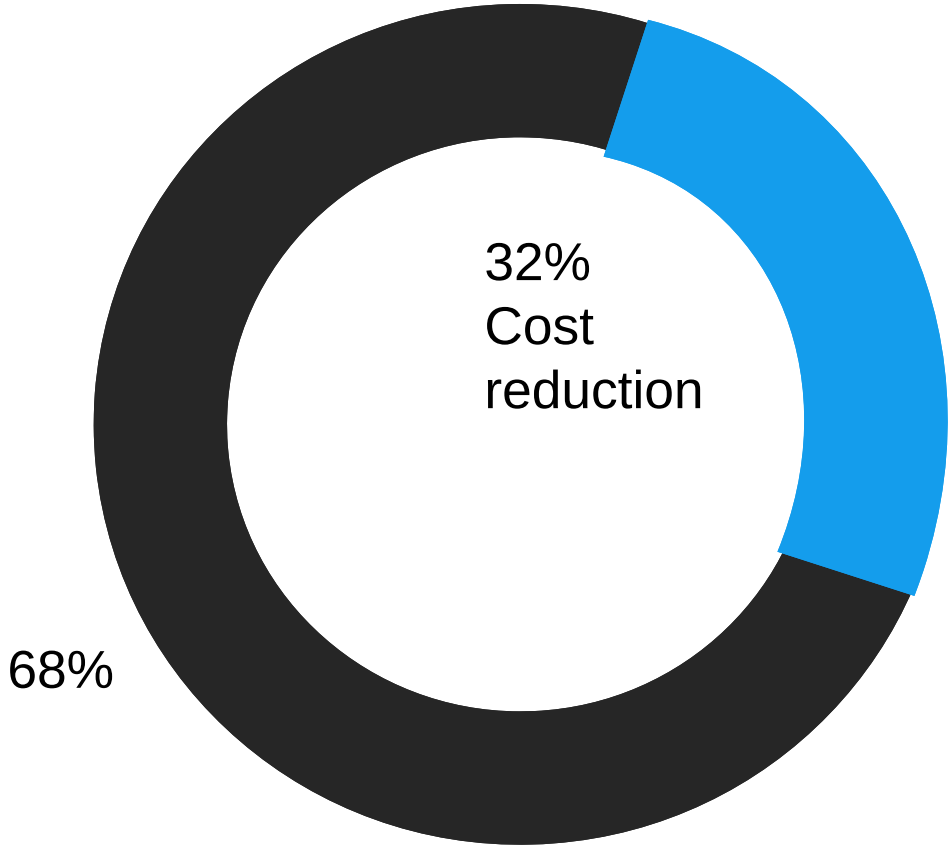
Traditional Manufacturing at MR



New Industrie 4.0 Production System



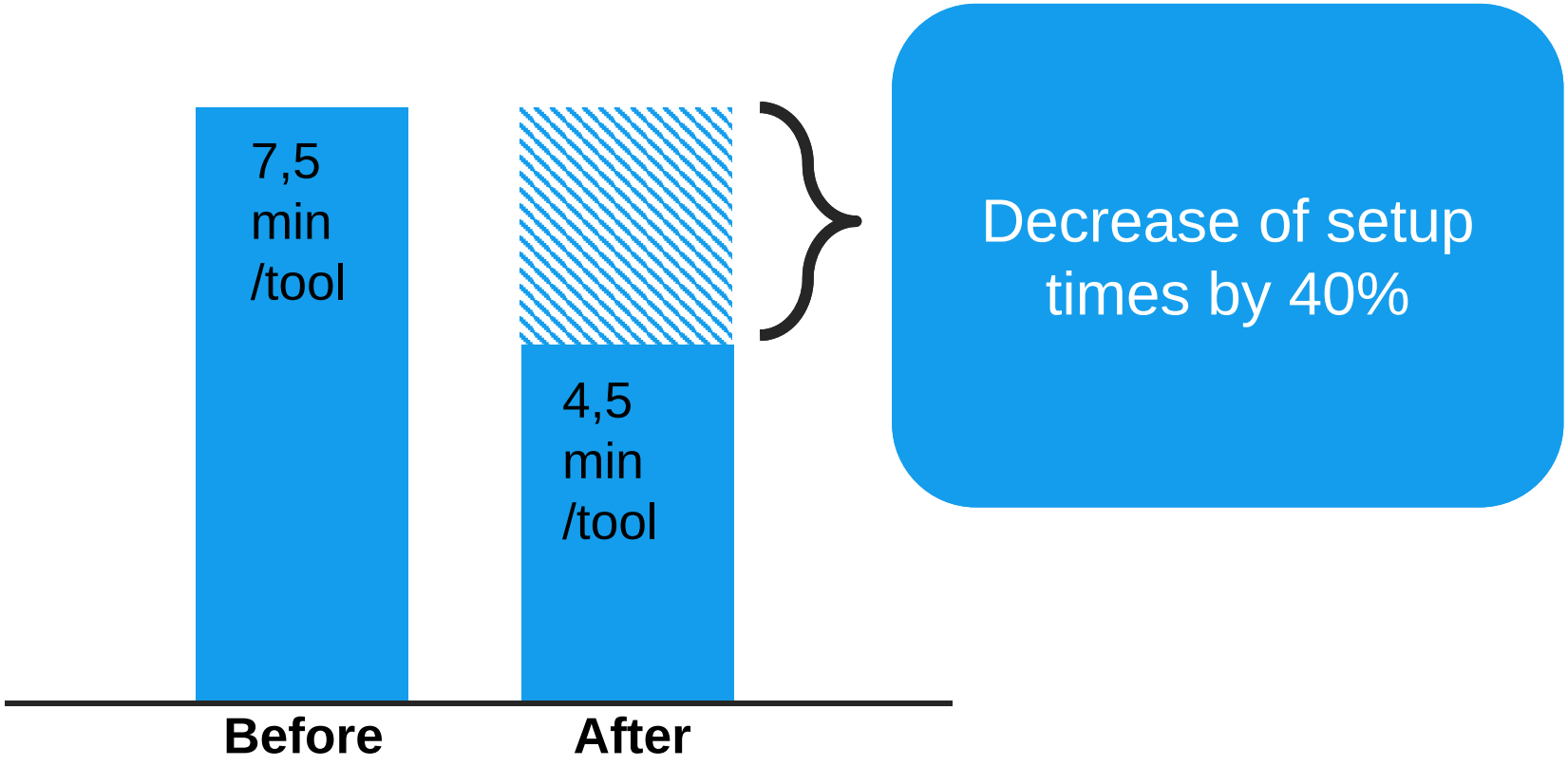
Benefits of the System: Lower Costs



Machine park with 17 machines:
Reduced costs by 500,000 € per year

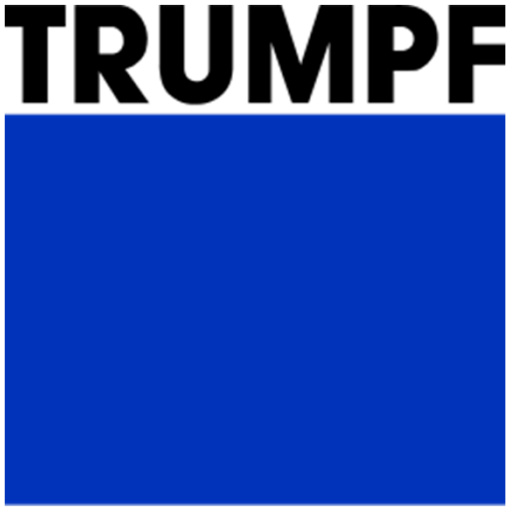
Source: www.reinhausen.com

Benefits of the System: Decreased Setup Time



Source: www.reinhausen.com

Process and status data from production/product

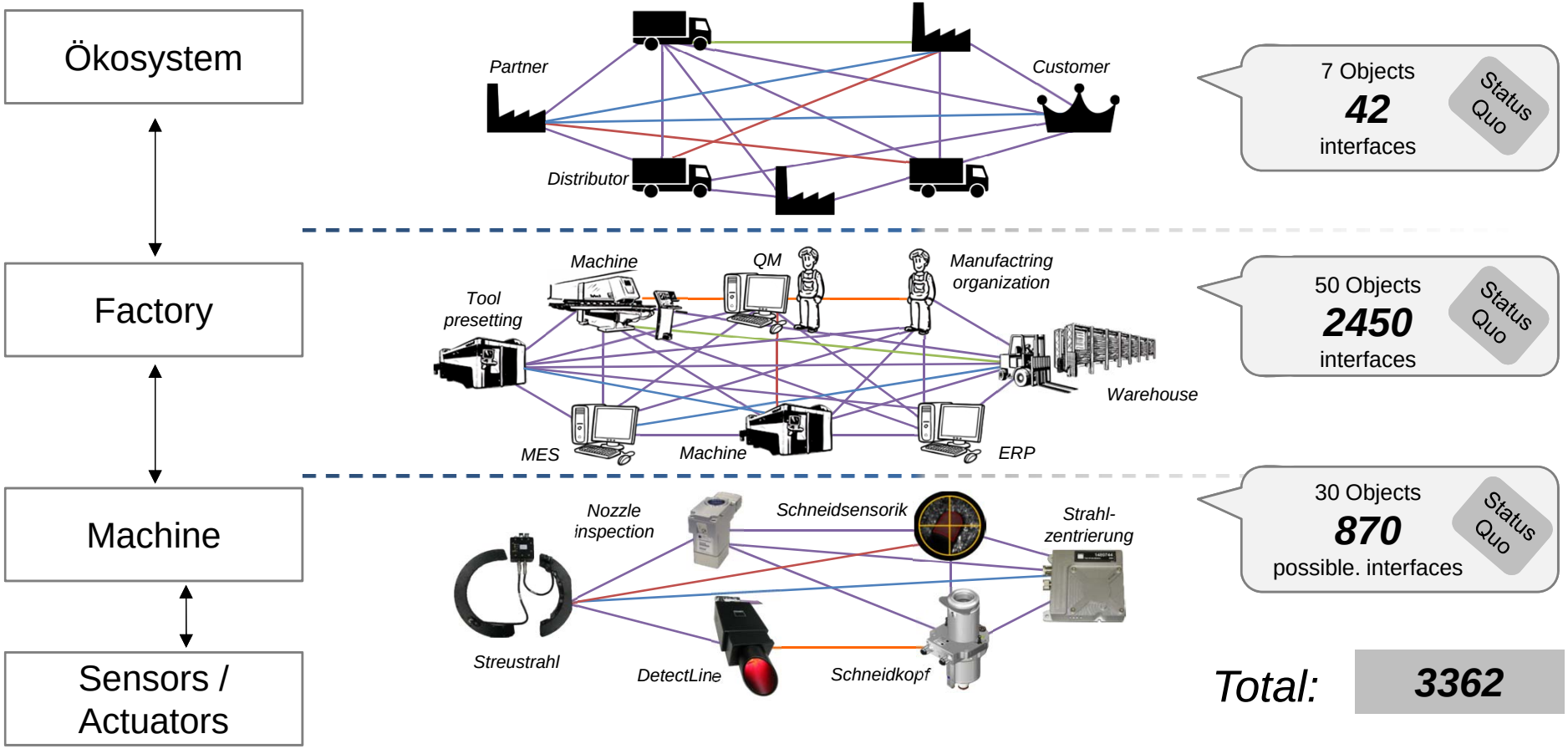


Project Industry 4.0

- One of the world's leading suppliers of machine tools
- Networking of machines with TruConnect System

- Goals:
  - Higher machine utilization, with smaller lot sizes
  - Transparency and asset management
  - Process stability and traceability
  - Better energy efficiency and increased productivity

Trumpf had high complexity along the value chain



Quelle: TRUMPF and Innovationszentrum für Industrie 4.0

TRUMPF's solution: TruConnect Smart Factory

TruConnect

- Covers all stages of the production process
- Tailored to meet the individual needs of the customer
- Modular can be extended, step by step optimization possible
- Increased efficiency in production
- Smaller lots viable

Fields of Application

- Quote generation
- Production planning
- Intralogistics
- Shipping and Contracts

- 75 % Planning / Management Costs

- 50 % Logistics Costs

Quelle: TRUMPF and Innovationszentrum für Industrie 4.0

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Intelligent Networking of the Market Players

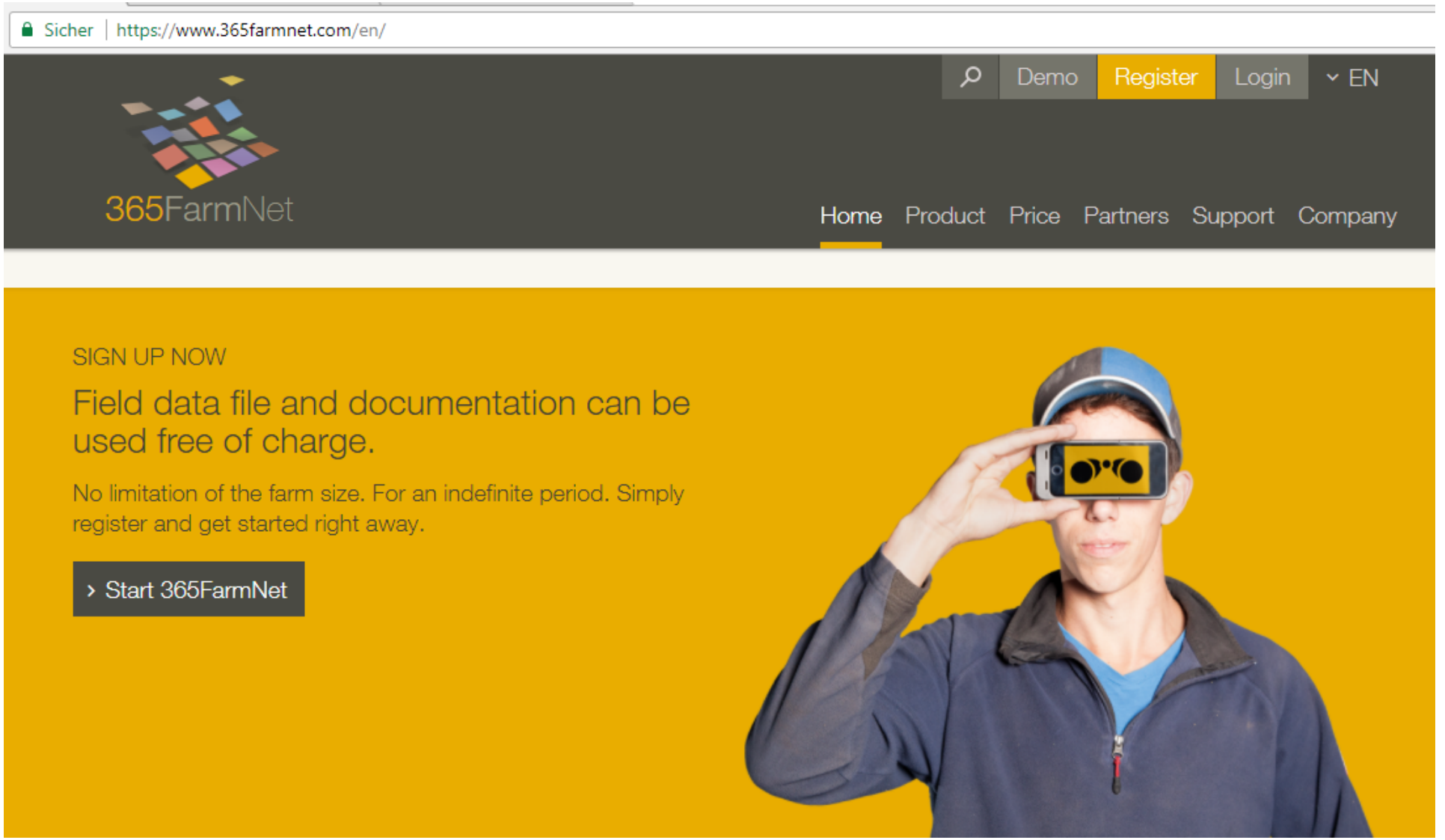
- **Claas** is a family-owned agricultural machinery manufacturer founded in 1913, based in Harsewinkel, Germany, North Rhine Westphalia.
- Their product range includes combine harvesters, forage harvesters, balers, mowers, rakes, tractors, and other harvesting machines.

Digital Platform for Farmers: 365 FarmNet

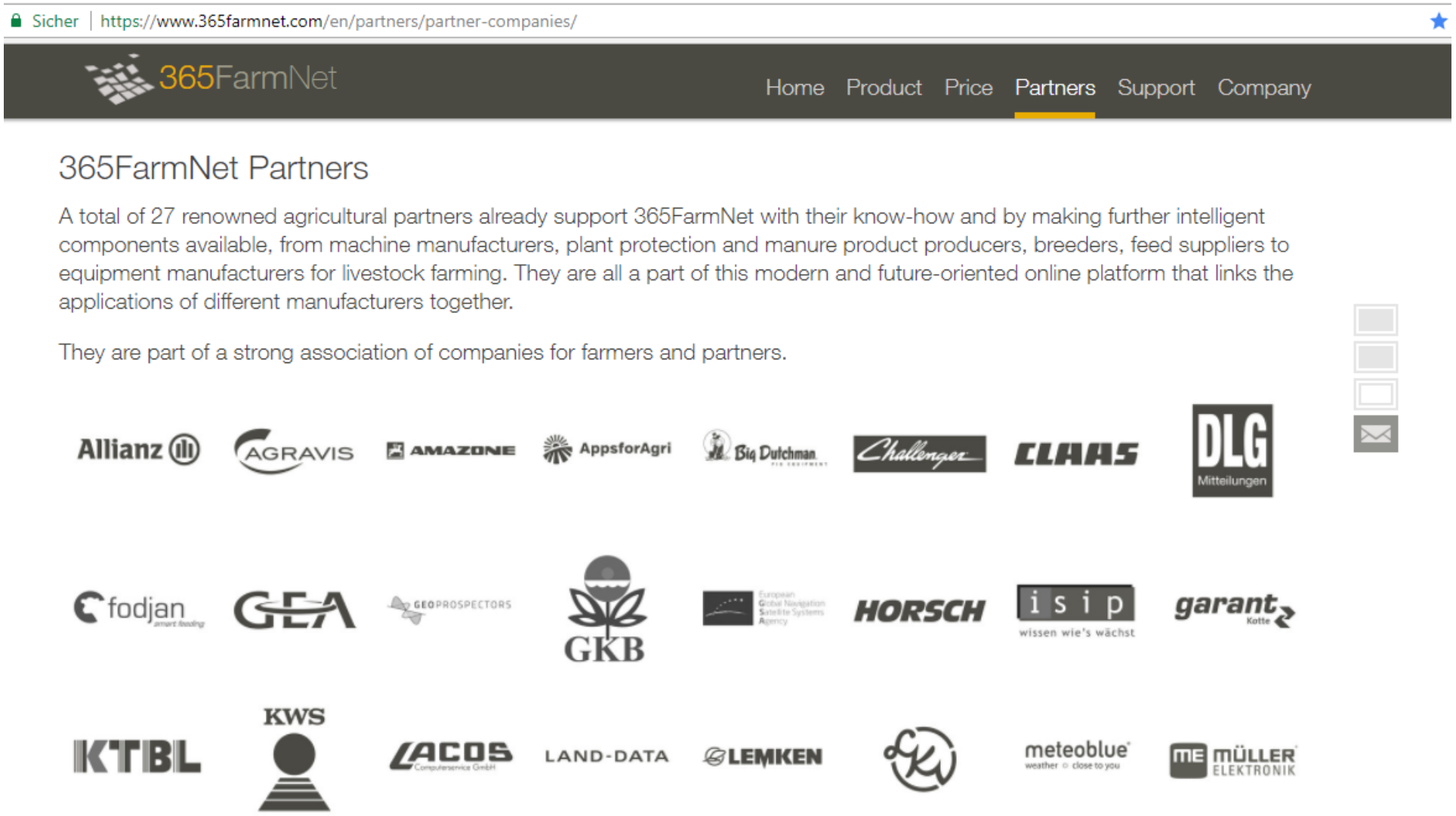
- Claas first attempted to develop an internal platform without success.
- Created in 2013, **365FarmNet** is a spin-off from Claas, with 50 employees based in Berlin and with an open architecture based on cloud services.
- **365FarmNet** allows over 35 other producers and service providers to offer their services to farmers. For example…
  - The chemical company Bayer AG provides weather information and recommendations about what pesticides are appropriate.
  - The seed company KWS provides information about which seeds can best be planted to achieve higher yields.
- More than 2000 farmers are paying for this information.

Source: Geschäftsmodell-Innovation durch Industrie 4.0
Chancen und Risiken für den Maschinen- und Anlagenbau,
Fraunhofer-Institut für Produktionstechnik und Automatisierung IPA, 2015

Digital Plattform for Farmers: 365 FarmNet



Digital Platform for Farmers: 365 FarmNet

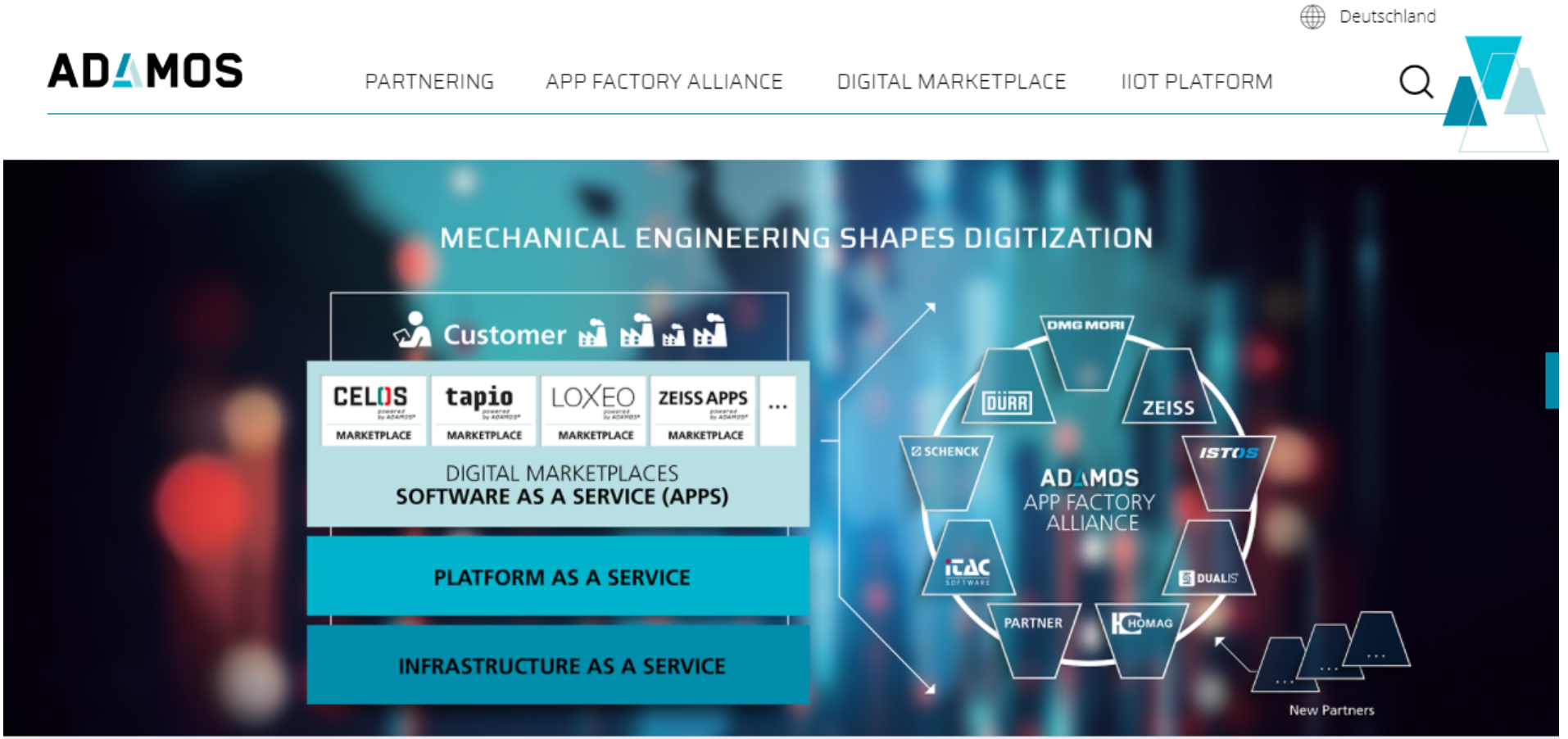


New and Specialized Platforms are Emerging!

- **ADAMOS** is a strategic alliance for machinery and plant engineering and stands for:

  ADAptive **M**anufacturing **O**pen **S**olutions.
- The joint venture was founded by **DMG MORI**, **Dürr**, **Software AG** and **ZEISS** as well as **ASM PT**.
- The aim of the alliance is to bundle knowledge in mechanical engineering, manufacturing and information technology and to establish ADAMOS as a global industry standard.
- The two pillars are:
  - **DAMOS IIoT platform:** Provides basic functionalities of a "Platform as a Service" (PaaS). It is the technological basis for digital marketplaces (ecosystems) of ADAMOS partners.
  - **ADAMOS App Factory Alliance:** creates a development environment in which app innovations and technology standards can be implemented equally, quickly and efficiently.

ADAMOS Platform



Conclusions

- The German Mittelstand is taking advantage of Industrie 4.0, but there is still great potential.
- Various new business models are possible.
- Attracting enough digital talent is difficult.
- Industry 4.0 will bring significant benefits, but large investments are required.
- More partnerships are needed between large established firms and the Mittelstand.
- International standards must be developed and international cooperation is crucial.

acatech calls for a Mittelstand Initiative

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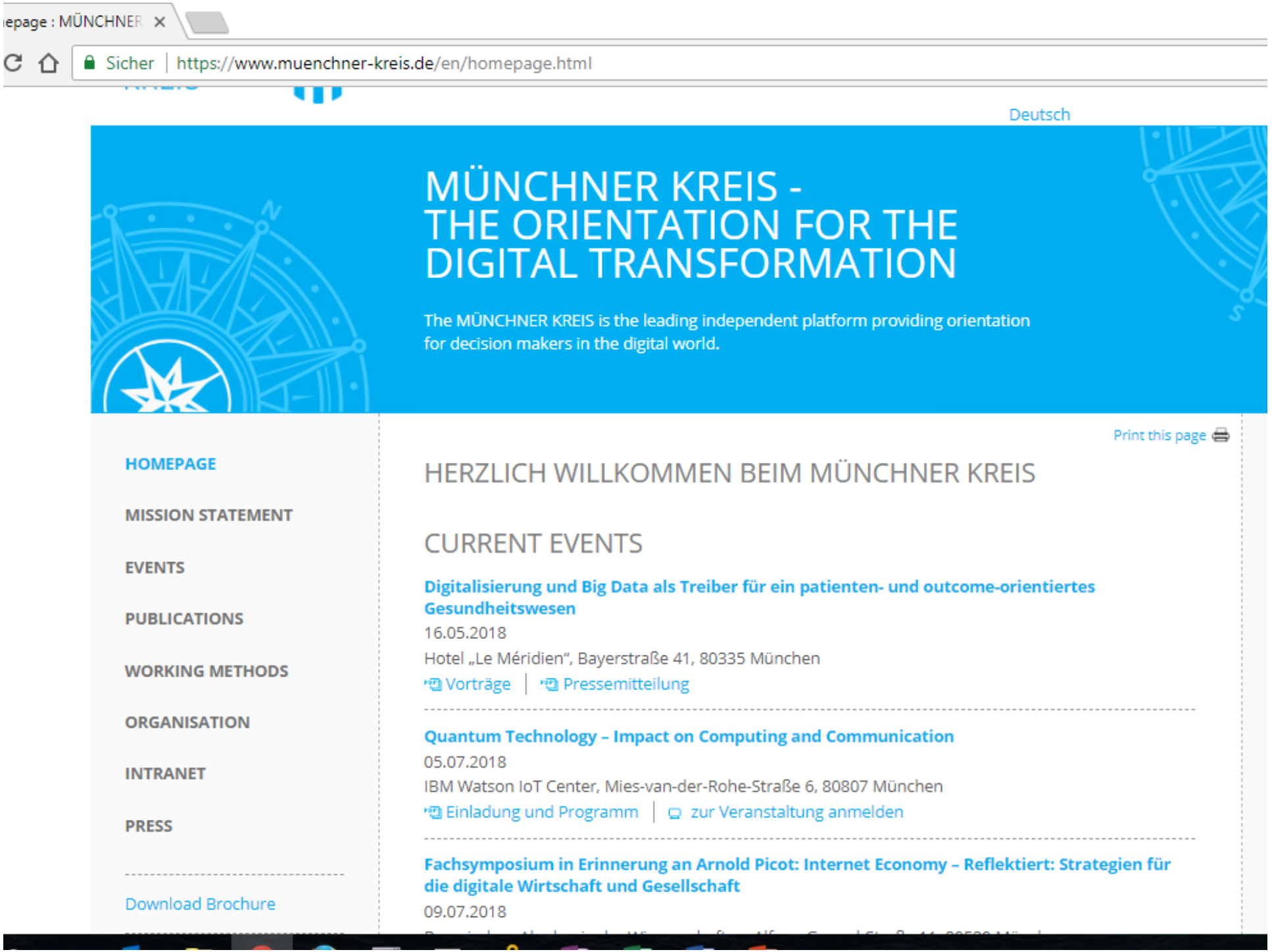
Co-President Dieter Spath at the acatech annual meeting in October 2017

- “Small and medium sized companies must have better access to cooperative research.
- In developing Industrie 4.0 and by building learning systems, Germany needs the strengths of academia, global corporations, hidden champions, small and medium-sized firms, and start-ups.
- acatech will start an innovation offensive for the Mittelstand in Germany.”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