4.2 Industry 4.0
Deep-dive Session

Christian Zeidlhack

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Capital Markets Day 2018
Berlin
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Deep-dive Session Industry 4.0

Christian Zeidlhack – "With Industry 4.0 we reach a new level of customer service"

Areas of Responsibilities

- Since 2016: Member of Executive Committee Industrial at Schaeffler, Responsible for Global KAM Industrial and Industry 4.0 at Schaeffler
- 2014 – 2015: Responsible for Raw Materials at Schaeffler
- 2007 – 2013: Responsible for Business Development & Key Account Management Heavy Industries at Schaeffler
- 2000 – 2007: Various positions at Daimler

Education

Dipl.-Wirt.-Ing. (FH) and University Degree – Dipl.-Oec.
Industry 4.0 @Schaeffler – The course has been set for future success

- **ONE** Strategic Business Field
  - Industry 4.0

- Regions **Europe** and **Asia/Pacific** as I4.0 Competence Centers

- Commitment to **10%** of sales target achievement

- **~300** skilled employees working on I4.0 business

- First **pilot projects** for digital services initiated

- **SCHAEFFLER** Product re-branding

- **SCHAEFFLER** Best-of-Industry Award for sensor bearings received

- **INDUSTRY 4.0**

  - First pilot projects for digital services initiated

  - **SCHAEFFLER** Product re-branding

  - **SCHAEFFLER** Best-of-Industry Award for sensor bearings received

- **September 20, 2018**
Industry 4.0 as integral part of division Industrial – Defined strategy already in execution

Portfolio Division Industrial

Industry 4.0 services

Mechatronics

Mechanical Systems

Components

Industry 4.0

Strategy Division Industrial

Industry 4.0 services

Mechatronics

Extend scope

Mechanical Systems

Components

Be an innovation leader for Industry 4.0 solutions in combination with extended service offerings

September 20, 2018

Capital Markets Day 2018 – 4.2 Industrial Division
Deep-dive Session Industry 4.0
Industry 4.0 @Schaeffler – Selected key areas for future success

- Wind Energy
- Power Transmission
- Intralogistics
- Machine Tools
Schaeffler has a pole position for integrated smartification and digitization of its high precision products, its system and application domain know-how, ending up in entrepreneurial spirit for Industry 4.0.

Source: IHS Markit – IoT trend watch 2018
Deep-dive Session Industry 4.0
Key area Machine Tools – Accessible market with huge potential for Schaeffler

Installed Base
Globally more than 3,000,000 high-tech precision machine tools already installed

New Production
Globally more than 150,000 high-tech precision machine tools per year

Production @Schaeffler
Globally more than 5,000 high precision machine tools in use

Source: IHS Machinery Production Market Tracker, VDMA, VDW, Schaeffler internal
Key area Machine Tools – Schaeffler well positioned with scalable Industry 4.0 solutions

- **Direct Drives Torque Motor**
  - Best-in-class direct drive torque motors for all kind of rotary axes in machine tools

- **Rotary table bearings incl. measuring system**
  - Fully integrated measurement systems in rotary table bearings with highest accuracy

- **Additional Services**
  - Condition Monitoring System: overall machine status
  - Vibro Control: In-process machined part quality control

- **Spindle sense solution incl. software package**
  - Measurement of displacement and forces in the spindle bearing to avoid spindle crashes

- **Smart linear guides – DuraSense & Magnescale**
  - Linear guides with fully integrated measurement system as well as automated relubrication process

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**Content per application**

€

Ø 10,000 – 15,000 EUR per machine

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**Highlights**

- **Added value for the customer** by fully automated data evaluation
- **No comparable** market product for sensorized solutions available
- **Optimized cost structure** by usage of variable module-based solutions
Key area Power Transmission – Accessible market with huge potential for Schaeffler

New Generator Production
Globally more than 350,000 power generators and medium voltage motors per year

New Gearbox Production
Globally more than 5,000,000 gearboxes and geared motors per year

Source: IHS Industrial Automation Equipment Market Tracker
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Key area Power Transmission – Schaeffler well positioned with scalable Industry 4.0 solutions

**SmartCheck**
- Easy plug & play condition monitoring unit with integrated data evaluation and alarm functionality

**TorqueSense**
- High-precision plug & play torque measurement module with integrated speed & temperature sensors

**Concept2**
- Demand-orientated automated lubrication for two bearings with various requirements

**VarioSense**
- Compact unit comprising standard rolling bearing and sensor cluster with dynamic configuration

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**Content per application**

€

Ø1,000 – 1,200 EUR
per drive train

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**Highlights**

- Easy plug & play solutions with integrated data analytics based on algorithms
- **Holistic variant management** based on connected standard products with modular concept
The Schaeffler Smart EcoSystem ...

- reflects a flexible, scalable and holistic business model for I4.0
- combines engineering-based Schaeffler expert knowledge with algorithm-based data modelling
- offers open interfaces for internal and external cloud-to-cloud solutions
Schaeffler Industry 4.0 Solutions
Putting digitalization into practice
Areas of Responsibilities

- Sept. 2018: Member of Executive Committee Industrial at Schaeffler, Responsible for Industry 4.0 at Schaeffler
- 2012 – 2018: Global R&D leadership positions for Software & Devices at Landis+Gyr
- 2010 – 2012: Head of Commercial Department at Landis+Gyr

Education

Master of Science in Process Technology, Licentiate Thesis in Process Optimization