



## 4.2 Industry 4.0 Deep-dive Session

Christian Zeidlhack

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Capital Markets Day 2018  
Berlin

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**Christian Zeidlhack (40)**

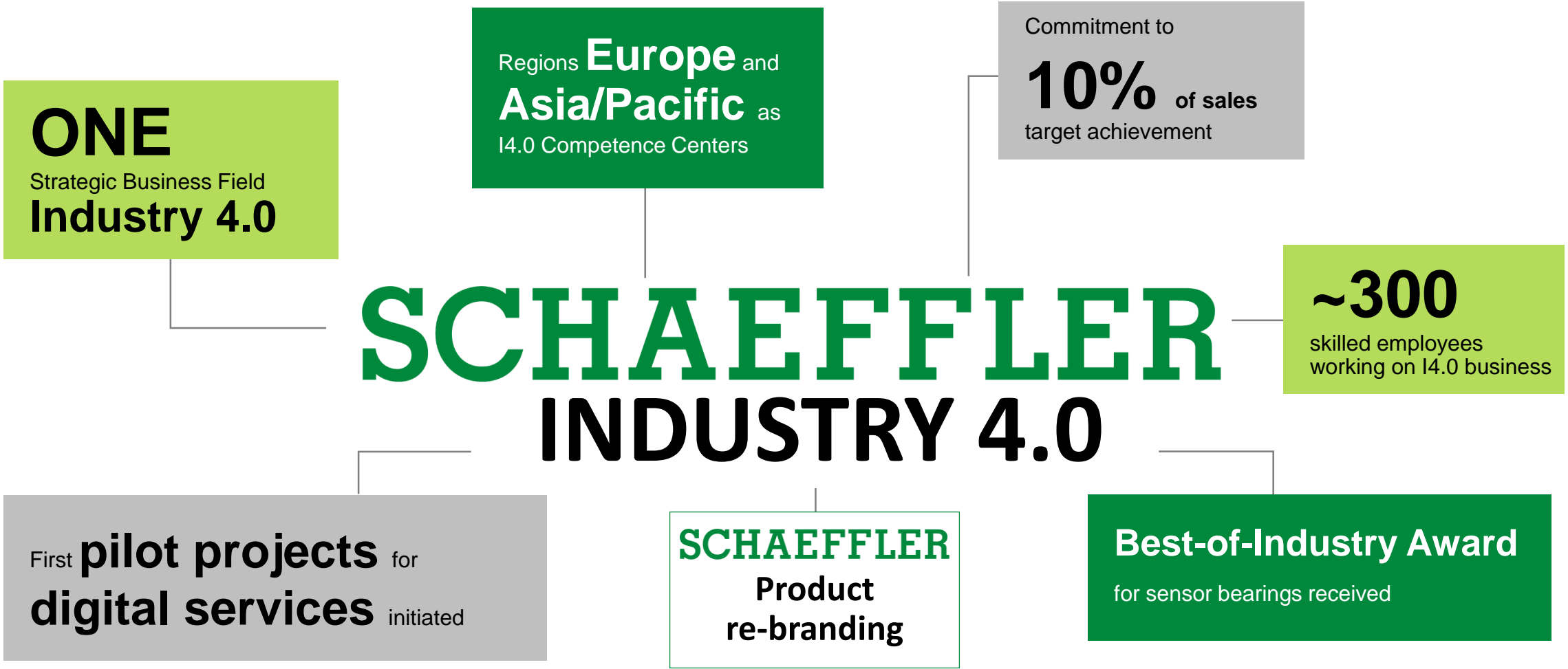
Member of the Executive Committee Industrial

### 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.



## Portfolio Division Industrial

Industry 4.0 services

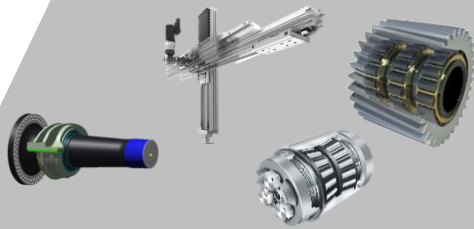


Industry 4.0

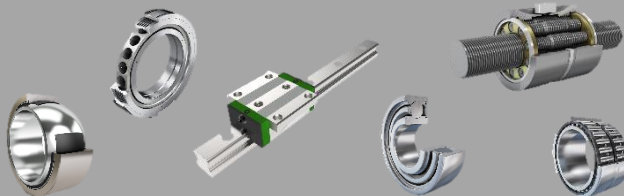
Mechatronics



Mechanical Systems



Components



## Strategy Division Industrial

Industry 4.0 services

Industry 4.0

Mechatronics

Extend scope

Mechanical Systems

Mechatronics  
Linear



Condition  
Monitoring



Sensorized  
Bearings



Direct  
Drives

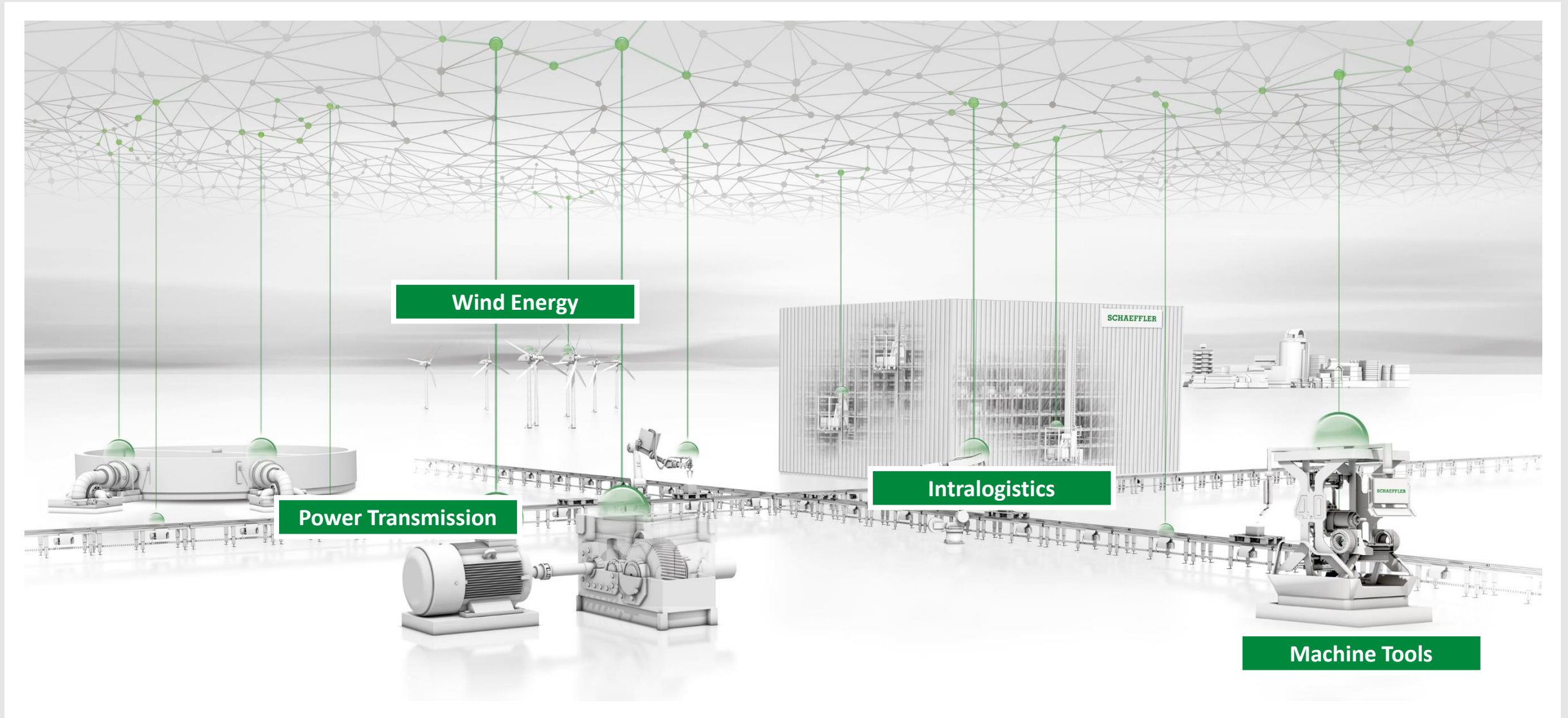


Digital  
Services



Components

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





## Collect Data



~37 billion sensors will be sold globally in 2018

Outlook:  
Annual growth of **10-15%**

## Connect Data



~31 billion devices will be connected globally in 2018

Outlook:  
Annual growth of **15-20%**

## Analyze Data



Massive data creation supported by service-based cloud business

Outlook:  
Annual growth of **25-30%**

**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

### 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

Machine Tools

Source: IHS Machinery Production Market Tracker, VDMA, VDW, Schaeffler internal

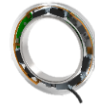


## Direct Drives Torque Motor



▶ Best-in-class direct drive torque motors for all kind of rotary axes in machine tools

## Spindle sense solution incl. software package



▶ Measurement of displacement and forces in the spindle bearing to avoid spindle crashes

## Rotary table bearings incl. measuring system

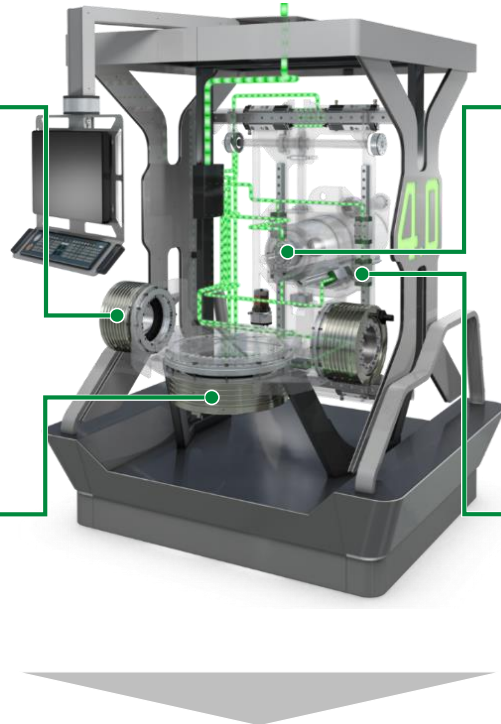


▶ Fully integrated measurement systems in rotary table bearings with highest accuracy

## Smart linear guides – DuraSense & Magnescale



▶ Linear guides with fully integrated measurement system as well as automated relubrication process



## Additional Services

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

Machine  Output

## Content per application



Ø10,000 – 15,000 EUR

per machine

## Highlights

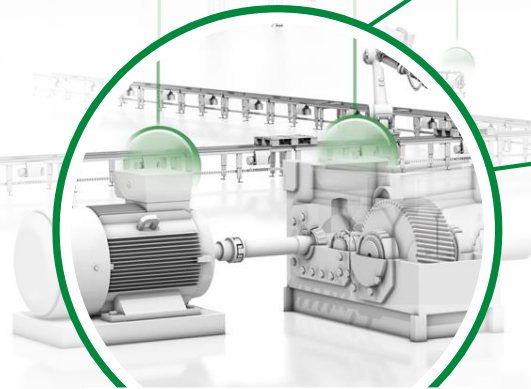
- ▶ **Added value for the customer** by fully automated data evaluation
- ▶ **No comparable** market product for sensorized solutions available
- ▶ **Optimized cost structure** by usage of variable module-based solutions

## 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



Power Transmission

Source: IHS Industrial Automation Equipment Market Tracker

SmartCheck

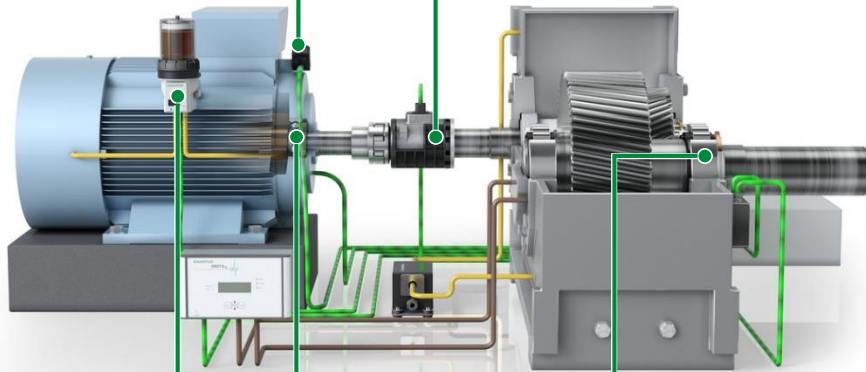


▶ Easy plug & play condition monitoring unit with integrated data evaluation and alarm functionality

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

Content per application



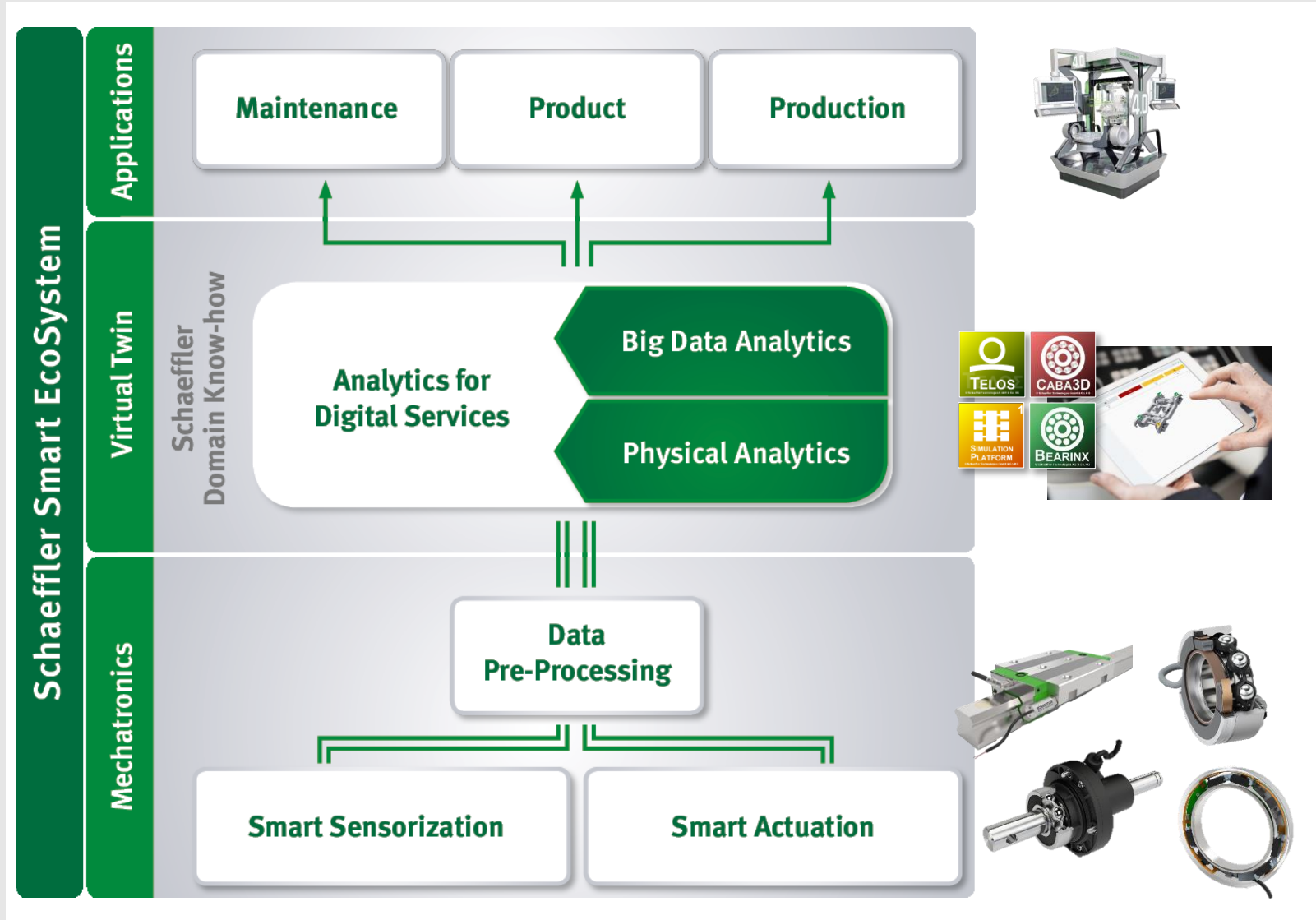
Ø1,000 – 1,200 EUR

per drive train

Highlights

- ▶ Easy plug & play solutions with integrated data analytics based on algorithms
- ▶ Holistic variant management based on connected standard products with modular concept

# Schaeffler Smart EcoSystem – Our strategic framework



## 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





**Rauli Hantikainen (57)**

Member of the Executive Committee Industrial

### 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
- ▶ 1992 – 2010: Global Software & Process Automation leadership positions at ABB

### Education

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