



# Siemens press conference

March 4, 2020

# Welcome

## Siemens press conference

March 4, 2020

## Siemens press conference

### Digital Enterprise – Taking the next step March 4, 2020

Jan Mrosik | COO Digital Industries  
Karen Florschütz | CEO Customer Services  
Eckard Eberle | CEO Process Automation  
Wolfgang Heuring | CEO Motion Control  
Rainer Brehm | CEO Factory Automation



# Digital Enterprise – Taking the next step

Dr. Jan Mrosik | COO Siemens Digital Industries



JanMrosik





3D-Printing

Cloud

AI

5G

Edge



**Hannover Messe 2020**

Digital Enterprise – Taking the next step

Digital  
Enterprise



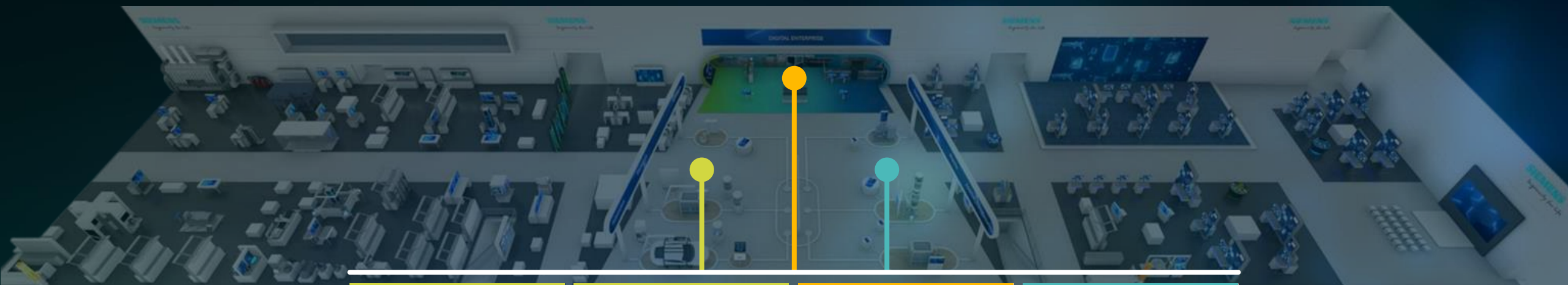
Industries



Cutting-edge  
Technologies



# Driving the digital transformation in all industries



**Chemicals**



**Pharmaceuticals**



**Food and  
beverage**



**Electronics**



**Automotive**



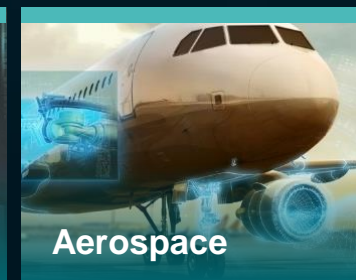
**Batteries**



**Intralogistics**



**Additive  
manufacturing**



**Aerospace**

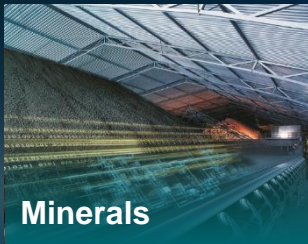


# Driving the digital transformation in all industries

## Process industries

## Hybrid industries

## Discrete industries



**Customer demands drive our business**

**Speed Flexibility**  
**Quality Efficiency**  
**New business models**  
**Environmental efficiency**  
**Safety Security**  
**Health**

# How?





# With an integrated digitalization approach

**Hannover Messe 2020**

Digital Enterprise – Taking the next step

Digital  
Enterprise

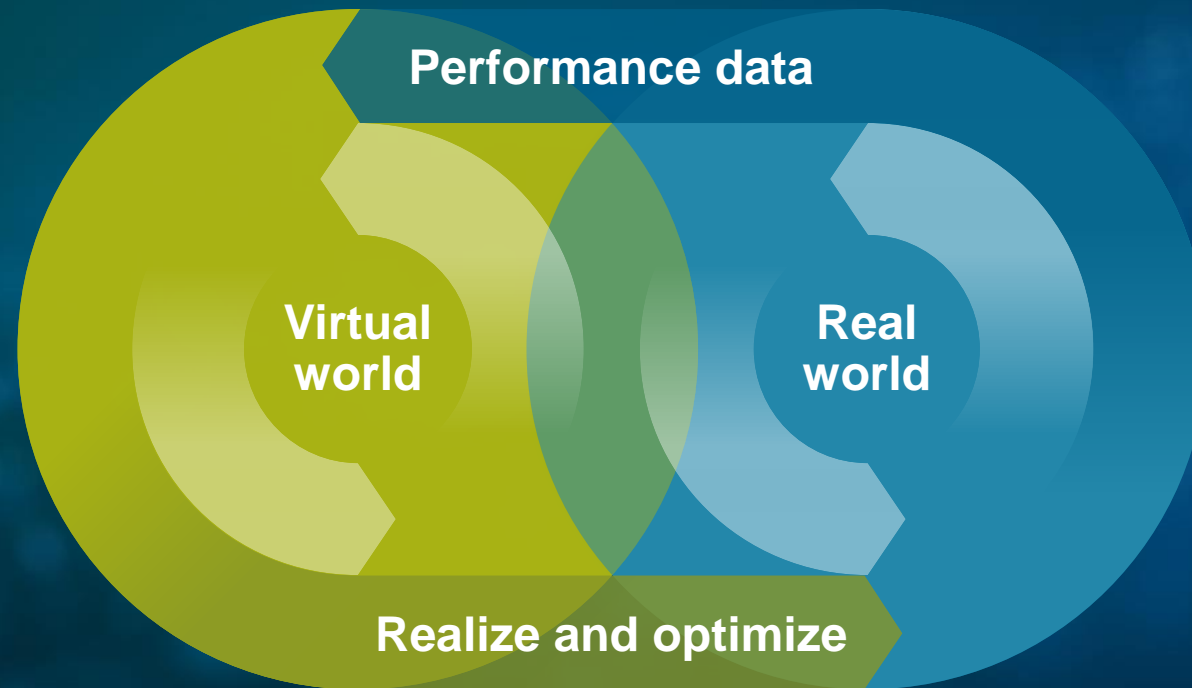


Industries



Cutting-edge  
technologies

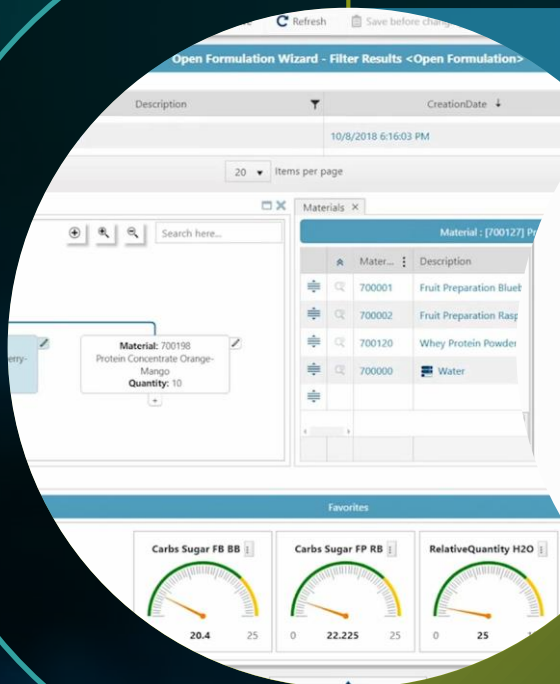
# Merging the virtual and the real worlds



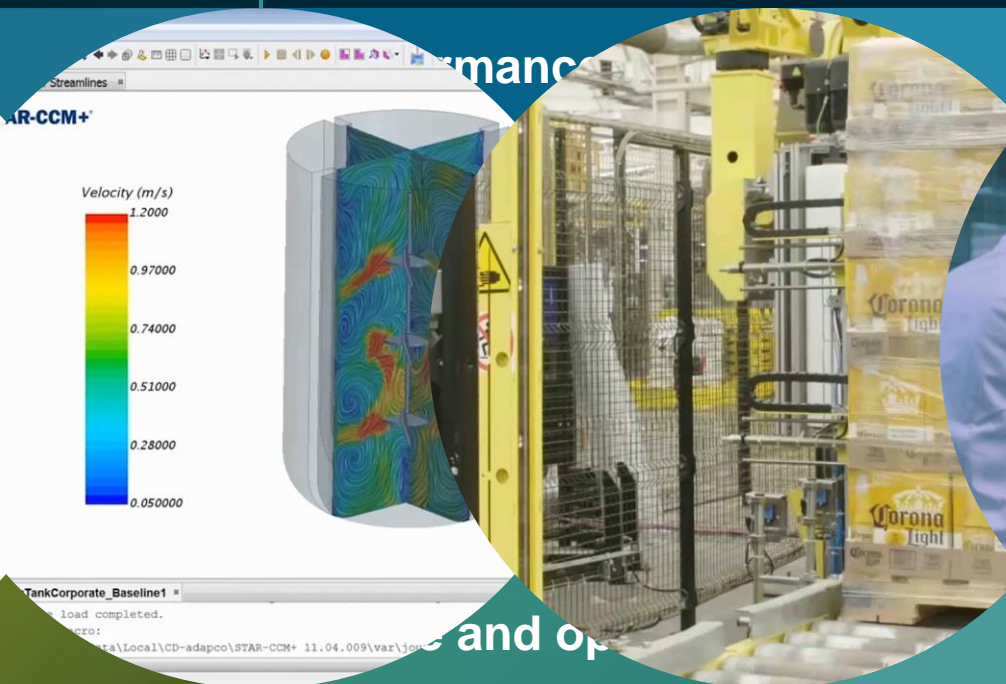


# Continuous optimization with the most holistic Digital Twin

## Digital Twin Product



## Digital Twin Production



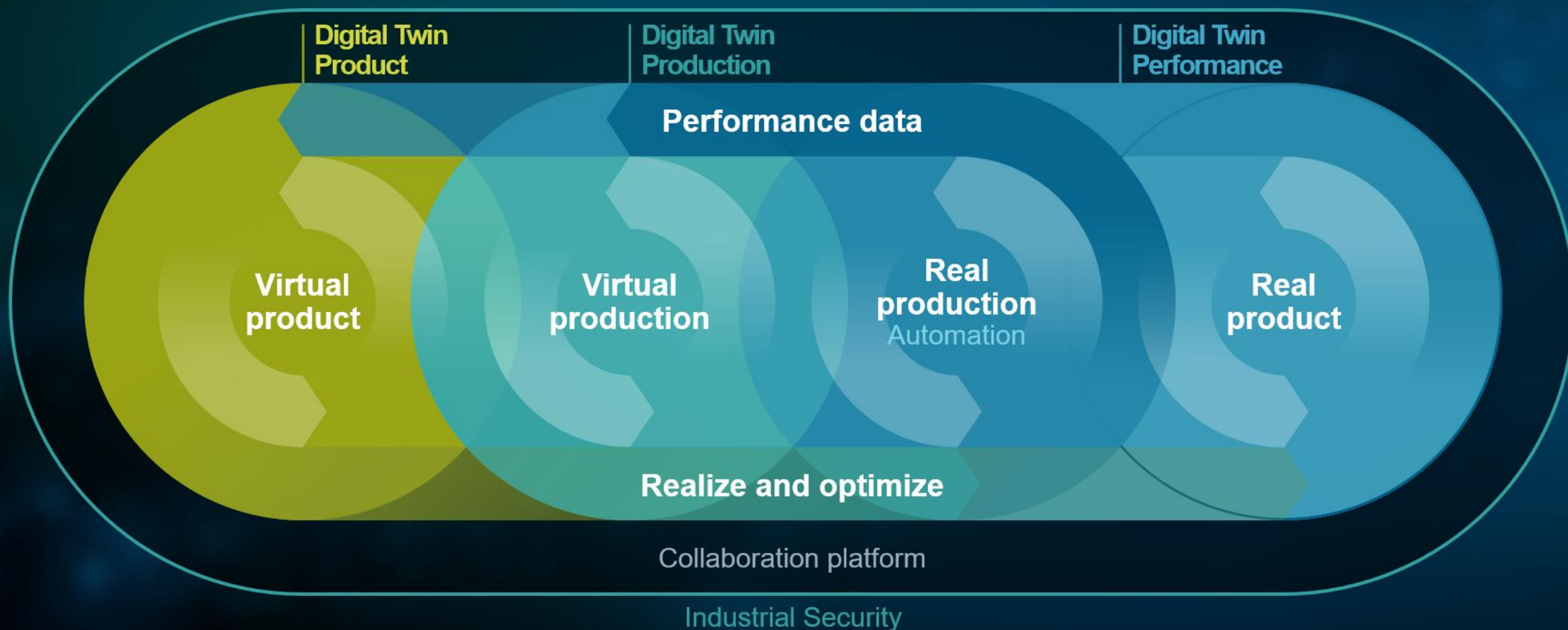
## Digital Twin Performance



Collaboration platform

Industrial Security

# Continuous optimization with the most holistic Digital Twin





**30%** reduction  
in development costs

**40%** reduction  
in time to market

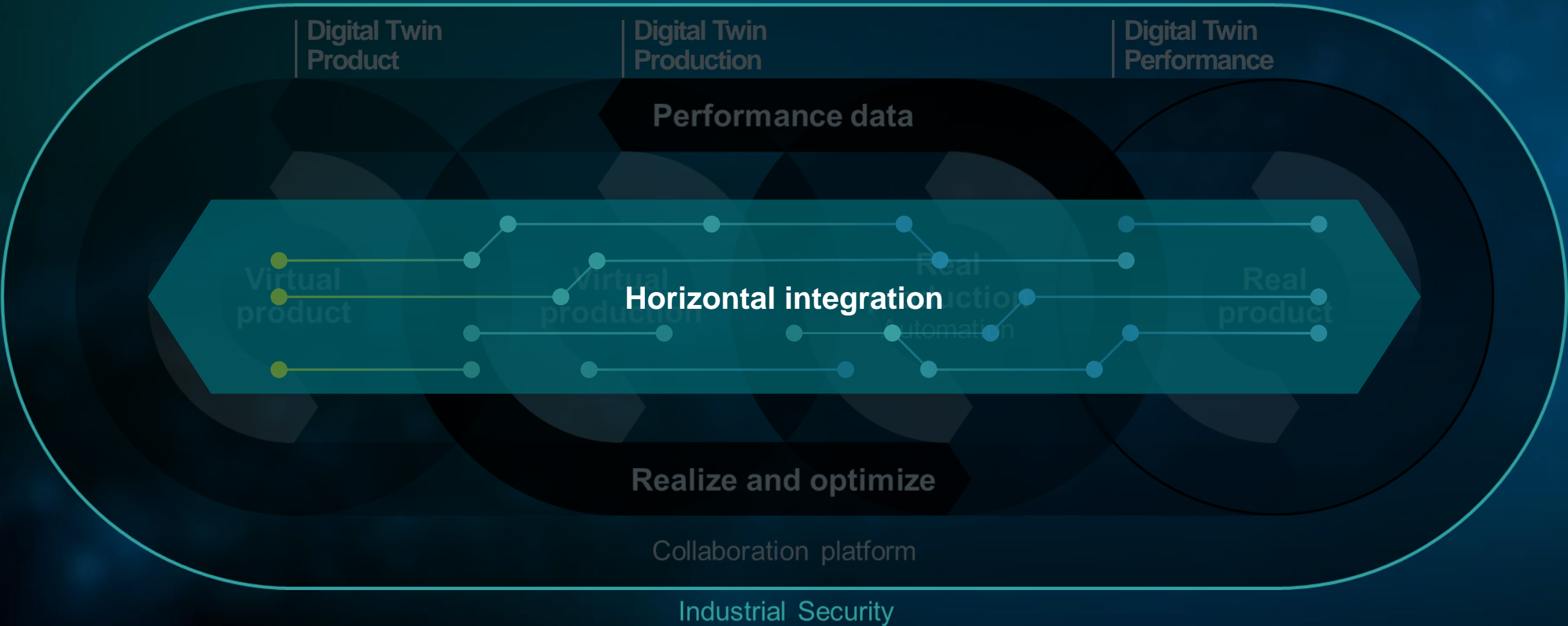
**90%** less energy

**70%** less film

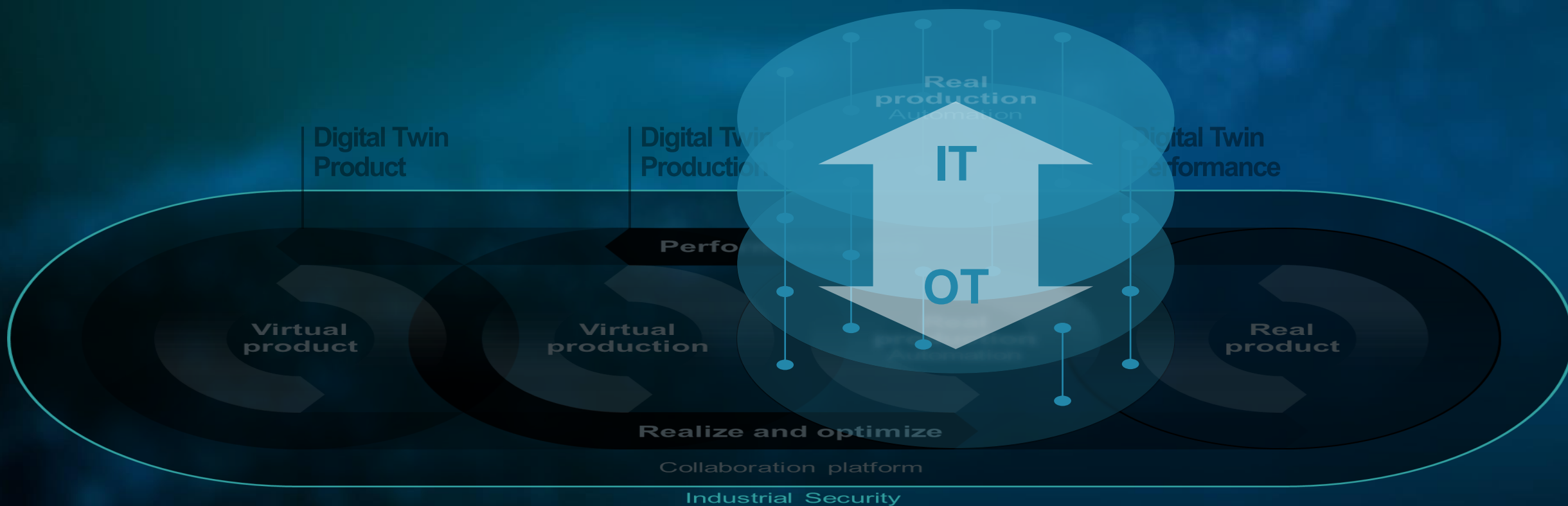
**TRAK RAP®**  
REVOLUTIONARY PACKAGING SYSTEM



# Siemens enables the horizontal integration of Digital Twins along the entire value chain



# Driving the industrial IOT through the vertical integration of OT and IT



# Vertical integration – using Edge, MindSphere, and Mendix low-code app development



# Digitalization is the key to achieving next-level productivity

€10 billion investment in acquisitions of  
software companies



1 Cooperation

© Siemens 2020

Page 20

March 4, 2020

[www.siemens.com/press/hm20](http://www.siemens.com/press/hm20)





Creating an open  
Industrial Edge platform



Precise simulation models  
for the entire lifecycle

A Siemens Business

# Catalyst for the Digital Enterprise

An integrated portfolio of software, services, and an application development platform that speeds the digital transformation cycle and unlocks a powerful industrial network effect. Blurs the boundaries between traditional stand-alone engineering domains like electrical, mechanical, and software.



# Digital Enterprise – Taking the next step

## Xcelerator deeply integrated in Industries



### Food and Beverage

End-to-end story  
Cold-brew coffee



### Electronics

Polar Electro pushes the limits of wearable fitness technology with Teamcenter, NX, and Mentor.



### Additive Manufacturing

Industrialize additive manufacturing with Siemens NX



### Automotive

Augmented reality in service at Porsche



### Aerospace

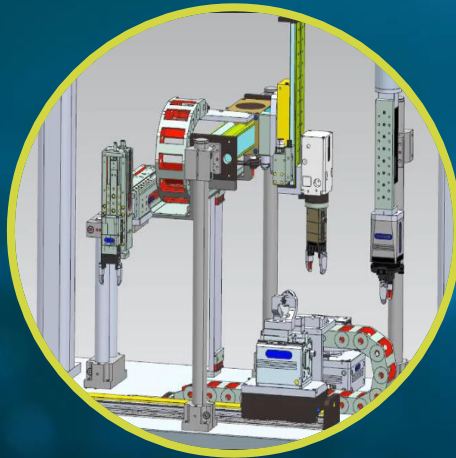
Helimods uses NX for innovative push-button stretcher-loading technology

# Hannover Messe 2020

Digital Enterprise – Taking the next step



Valeo Pace



Demonstrator  
with Schunk, Sick, Festo



Grundfos Pump



**Hannover Messe 2020**

Digital Enterprise – Taking the next step

Digital  
Enterprise



Industries



Cutting-edge  
technologies

# Cutting-edge technologies at Hannover Messe 2020



**Additive  
Manufacturing**

---

**Artificial  
Intelligence**

---

**Industrial 5G**

---

**Industrial Edge**

---

**Industrial IoT**

---

**Autonomous  
Systems**

---

**Cloud  
Technologies**

---

**Blockchain-  
Technology**

---

**Augmented  
and Virtual Reality**

---

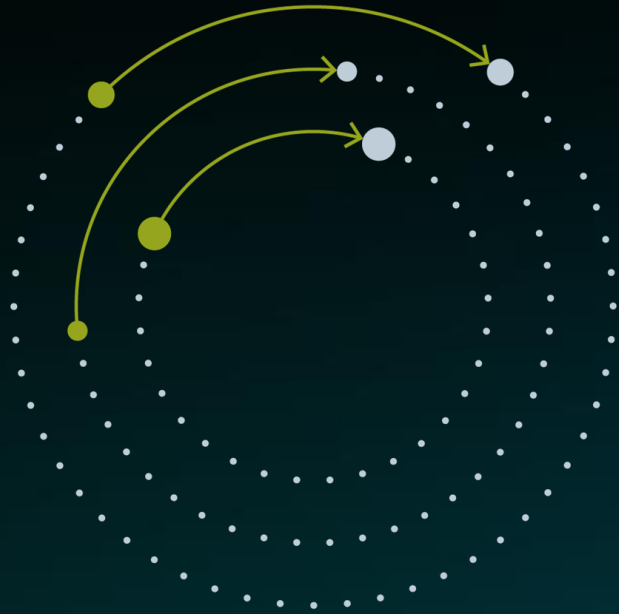
# How?



# Customer Services – Taking the next step

Karen Florschütz | CEO Customer Services

**With a unique customer approach...**



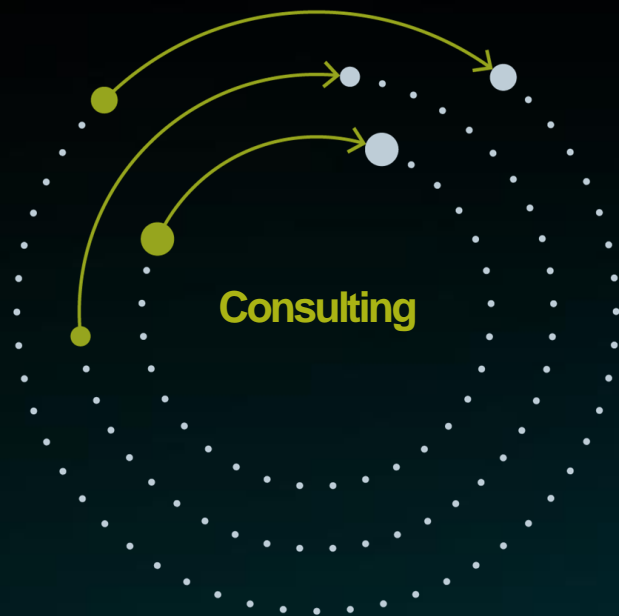
**Consulting**



**Implementation**



**Optimization**



Assessment of the customer company's level of digitalization by our service experts.

Development of a digitalization strategy tailored to your needs and business drivers.



Implementing tailored solutions by generating digital twins of our customers machines, plants, production and products in order to realize his digital transformation.



Data analytics as well as artificial intelligence turn data into valuable insights for a continuous improvement and transparency in order to help our customers to reach their next level of productivity.







## Reference Nestlé, Juuka, Finland

*“Juuka digitalization showcase will act as a global best practice model for Siemens / Nestlé cooperation”*

Peter Suess, Chief Engineer, Nestlé

# Reference Nestlé, Juuka, Finland – Customer challenges and benefits

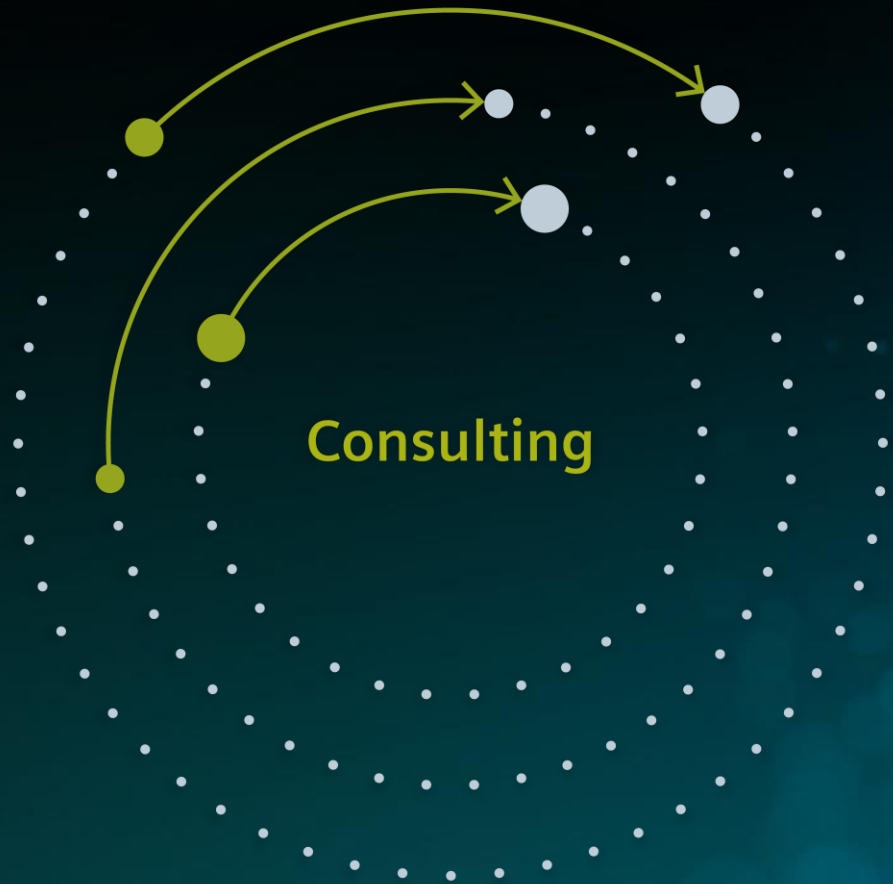
## Challenges

- Increase transparency of manufacturing process process, in order to increase quality and performance to the next level
- Improve competitiveness and profitability with reduced cost-of-production
- Solution for Closed Loop Manufacturing including Plant Simulation, TIA Portal, Preactor Scheduling and MindSphere IIoT
- Need for an automatic and transparent production environment that enables continuous development

## Benefits

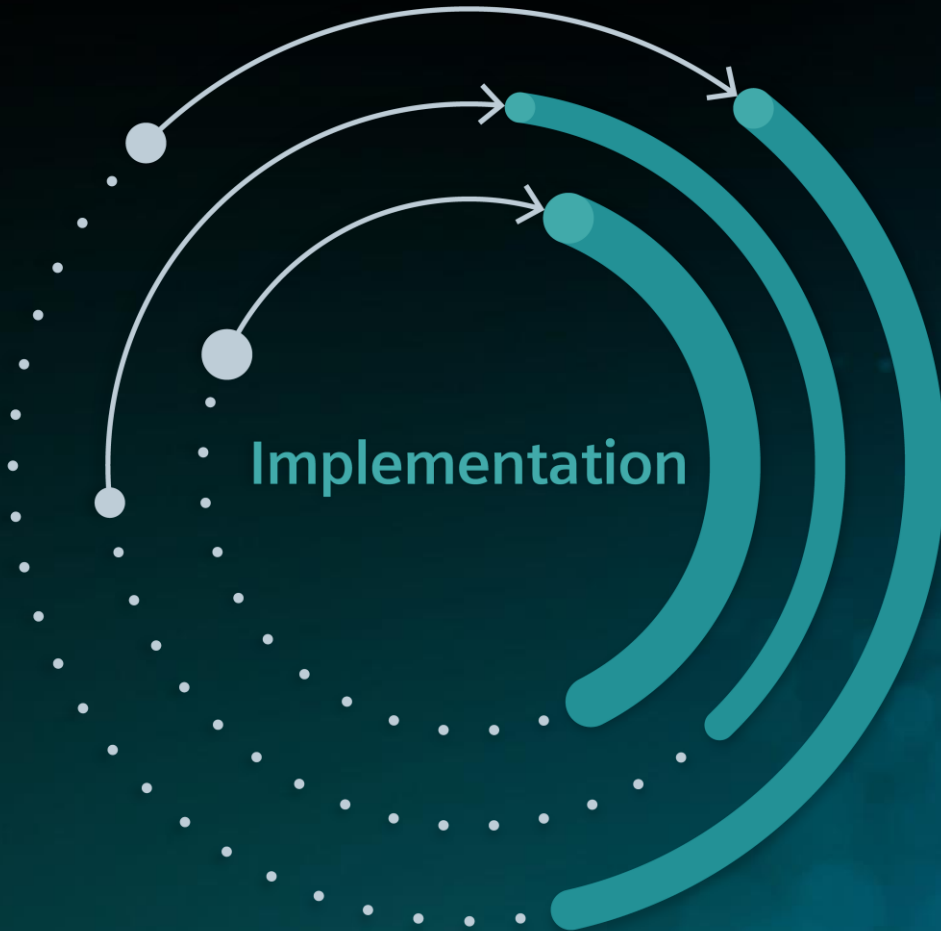
- Production transparency
- Increased productivity
- Performance-based service contract and collaborative approach with Siemens experts (less risk, shared benefit)





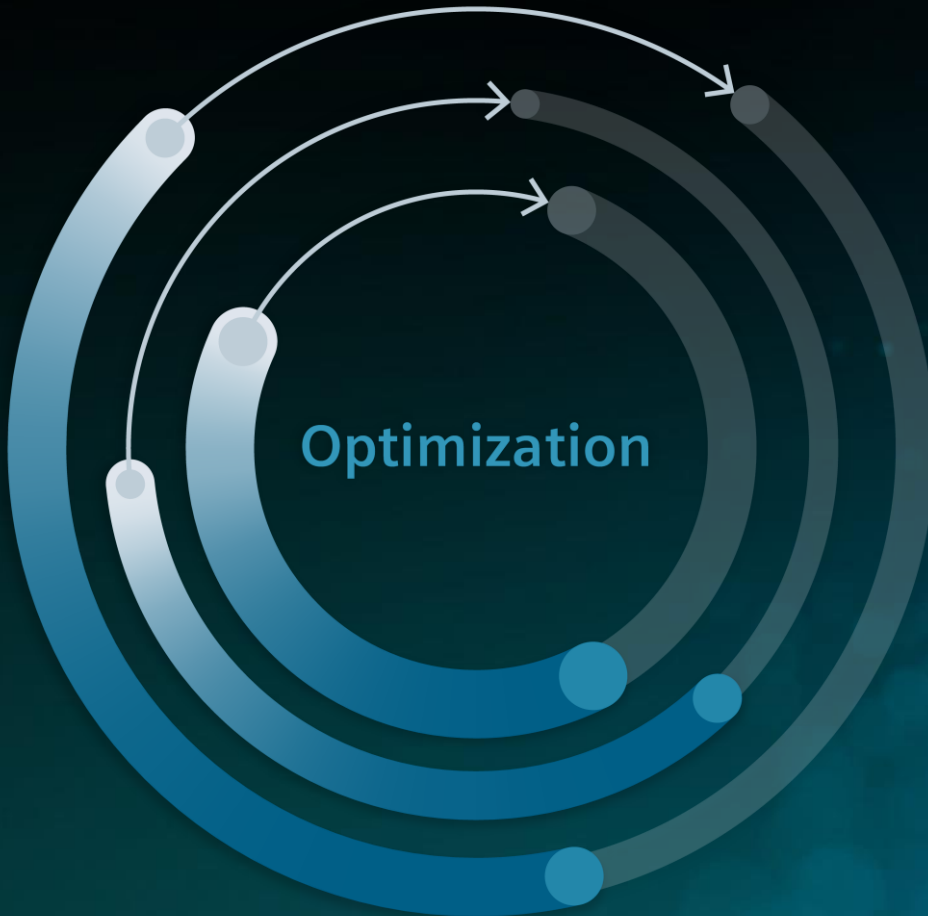
## Consulting

- Consultative discussions and workshops including all relevant stakeholders in the ecosystem: Nestlé, Siemens Experts , process consultants, integrators etc.
- Analyze the production by using a Digital Twin (Tecnomatix Plant Simulation) model of the plant



## Implementation

- The complete factory automation system was modernized to the latest state-of-the art engineering (TIA portal V15) and equipped with the relevant industrial software platforms to ensure open and continuous data-driven development
- Siemens used the latest technologies in engineering such as simulation (SIMIT, PLC SIM) and virtual commissioning (SINEMA server)
- MindSphere connection for data gathering and transparency



## Optimization

- Siemens and Nestlé have now entered into the continuous improvement phase (analytics and process improvement)
- The parties have committed to a performance-based service contract in order to reduce cost-of-production and improve quality, process and security



# AI Services

AI Services ensure the connectivity from field level to edge and cloud assisting to evaluate results of data analysis.

In order to detect and correct failures at an early stage, we offer **Predictive Services** using Artificial Intelligence algorithms to avoid unplanned machine downtimes.

By adding **Closed Loop Analytics** we leverage so far unattainable potentials with data analytics and artificial intelligence in your production and process environment.





# Customer Services – Taking the next step

## Digital Enterprise Services

End-to-end approach via Consulting, Implementation and Optimization



## Predictive Services for Foundry (AI)

New

Detection and correction of failures at an early stage by using AI algorithms to avoid unplanned downtimes



## Closed Loop Analytics Services for Electronics (AI)

Optimization of individual processes or entire plants through data analytics and AI



## Location Intelligence

New

Analytics of location information combined with business data to bring transparency into production and logistics processes



## Meet us at Hannover Messe!

## SITRAIN access

New

Exclusive, individualized trainings provided in a virtual, cloud-based exercise environment



## Predictive Services for Drive Systems

New

Transparency of motor and converter operational status to improve productivity by optimized service cycles



## Industrial Automation DataCenter

Preconfigured virtualization solution installed on a turnkey basis with coordinated lifecycle services





# Process Automation – Taking the next step

Eckard Eberle | CEO Process Automation







**Shortest  
time-to-market**

for highest  
variety

**Highest  
flexibility**

for modular  
plants

**Maximum  
productivity**

for large-scale  
production

Quality

Environment

Health

Safety

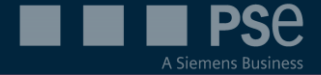
Security

**Innovation Industrial 5G**





Improvement in process economics:  
“10s of millions of Euros”



**Shortest  
time-to-market  
for highest  
variety**

# Simulation

Fast changes in production

Secure reliable and safe manufacturing

Seamless integration of virtual and real world



# Shorten time-to-market with faster commissioning thanks to simulation

## SIMIT

- Virtual commissioning of plants and machines
- Central simulation platform for all digital industries
- Realistic operator training environment using real PCS and simulation of the plant in SIMIT

## Perfect interplay with gPROMS from PSE

- Seamless use of process models throughout the entire process lifecycle
- Close linkage of Comos, Simatic PCS and Simit with PSE's gPROMS Advanced Process Modelling technology







“key requirement for speedily  
advancing the Industrie 4.0 concept”

Highest  
flexibility  
for modular  
plants

# Modular Automation

Traceability and quality assurance

Short changeover and start-up times

Interaction of multi-purpose and decentralized plants



# SIMATIC PCS neo fully realizes the philosophy of Module Type Packages (MTP): Higher flexibility by standardization for open automation concepts

## Native MTP\* Integration in SIMATIC PCS neo:

Module automation, import and export of MTPs, visualization and orchestration

### Benefits:

- Better interoperability and faster production processing with easy, flexible and secure integration of manufacturer independent modules
- Plug-and-Produce on the technological level
- Comfortable supervisory control of large hierarchical systems

\* Open Standard by ZVEI, NAMUR and ProcessNet



“In the future, it will be even more important for us on the industry side to agree on standards for how machines communicate with one another. This is a key requirement for speedily advancing the Industrie 4.0 concept.”  
Matthias Wiemann, GEA separators





# Optimization

Up to 20 % improved OPEX through big data analytics and predictive maintenance

**Maximum  
productivity**  
for large-scale  
production

Sustainable production

Increased efficiency

Managed complexity

# Managing data and visualizing your digital twin with PlantSight and Industry Apps for constantly optimizing production

**PlantSight** – the Digital Twin cloud-portal that provides an immersive view of reality

- Contextualized search and find for better and faster decisions at your fingertips
- Increase asset availability
- Improve workforce efficiency
- Lower total cost of asset ownership

**Process Industry Suites** – Smart applications and digital services

- Increased plant uptime by pre-alerting on failures
- Higher operation efficiency through predictive monitoring
- Better decision accuracy through identification of correlations hidden in data



**“Equipment Predictive Analytics (EPA) is an important and necessary part of the smart plant which is a practical and robust tool for predictive maintenance integrating human experience, know-how with machine data analytics and computing capability.”**

Mr. Chen Xin, Director, Sinopec QRC



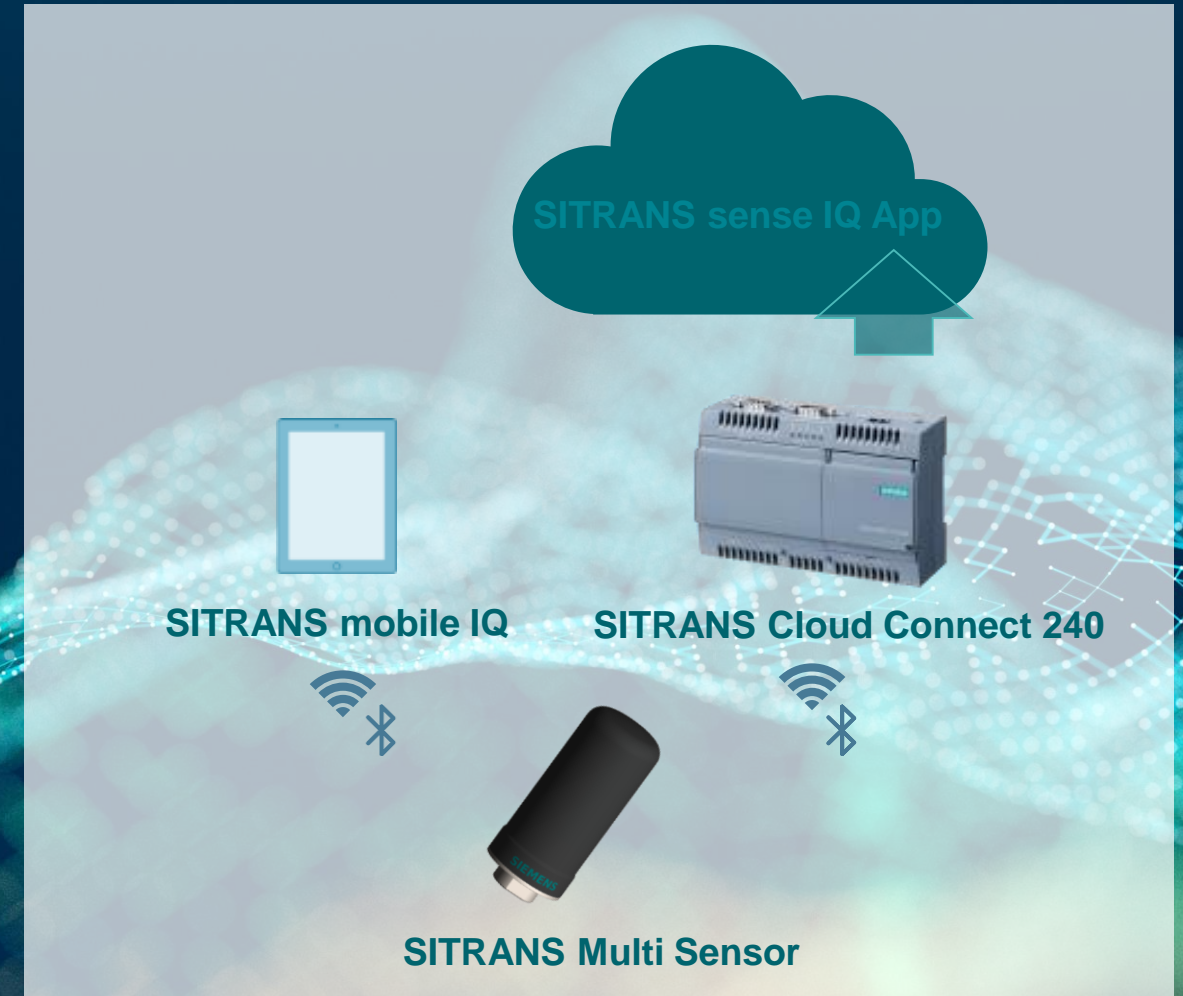


# IOT capable multi sensor for predictive maintenance of plant assets

**Condition monitoring of assets such as pumps, compressors, gears and valves with AI-based analysis of sensor data, e.g. vibration states and temperatures**

**Benefits:**

- Information on predictive maintenance through machine KPIs and condition notifications
- Access and visualization with mobile device via Bluetooth or with Cloud application
- Robust design for use in Ex- areas
- Reduction of unplanned plant downtime through detection of upcoming asset failures





# Industrial 5G



Meet us  
at the 5G Arena  
at Hannover fair!



# Process Automation – Taking the next step

## gPROMS (PSE)

Optimized production processes with model-based simulation



## SIMATIC PCS neo

Pioneering control technology based on proven hardware



## PlantSight

Complete system overview with consolidated 1D, 2D and 3D data



## SITRANS MS-S Multisensor

New

M&O sensor for assets without own sensors



## SITRANS CC240

Gateway for cloud connection of field devices (2nd Data Channel)



## Meet us at Hannover Messe!

## SITOP PSU8600

Power supply system for digitization, now also for single-phase networks



## CloudConnect

In a professional way from the sensor to the cloud



## SINEC NMS

New generation network management



## SIMATIC RTLS

Localization solutions for the digital factory



## Industrial 5G

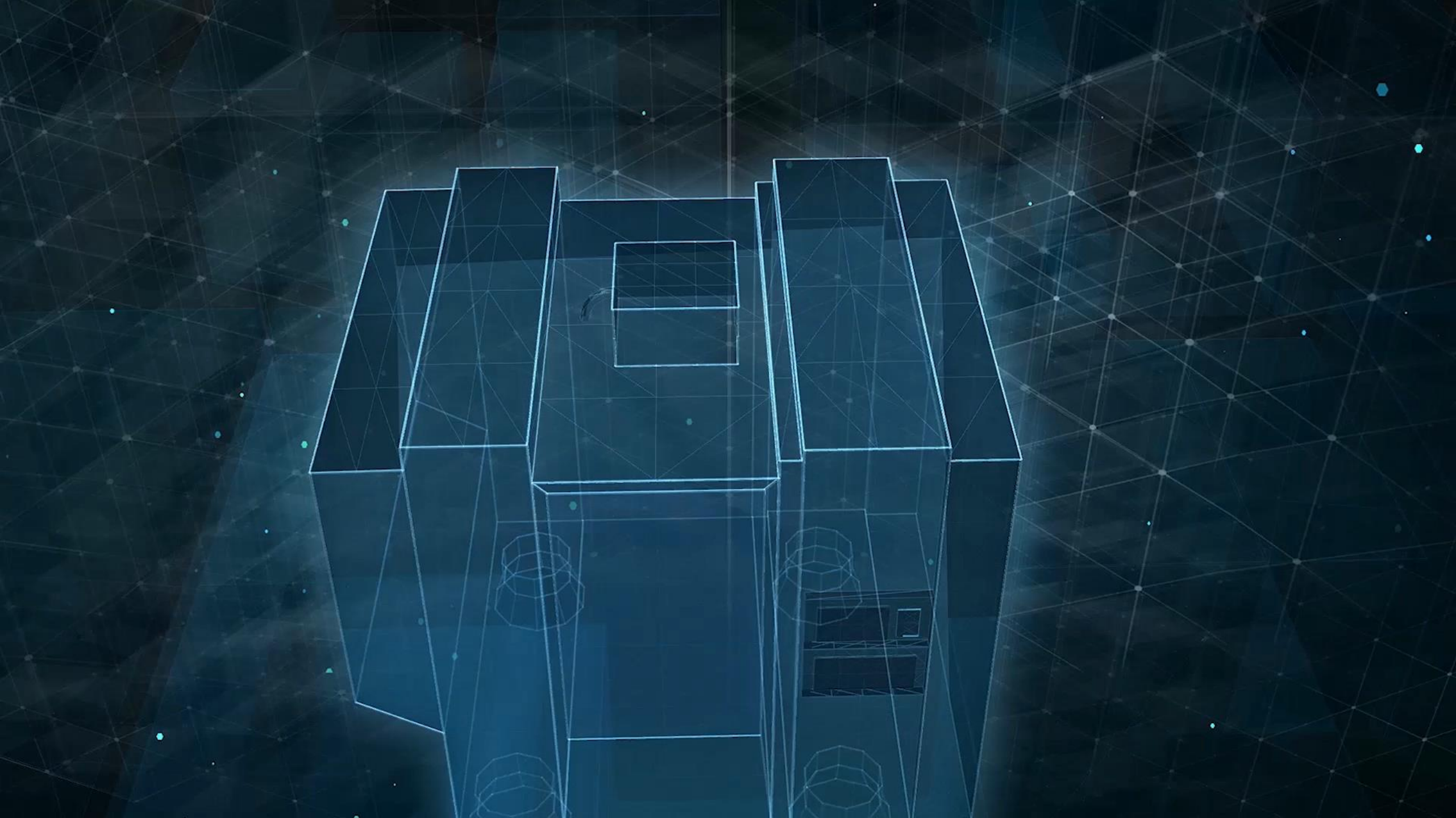
Reliable, high-performance and ultra-low latency wireless communication





# Motion Control – Taking the next step

Dr. Wolfgang Heuring | CEO Motion Control





# NEXT STEP MOTION CONTROL

**Intelligent production**

Higher efficiency

Shorter time to market

**New manufacturing technologies**

Environmental efficiency

# NEXT STEP MOTION CONTROL

First time right

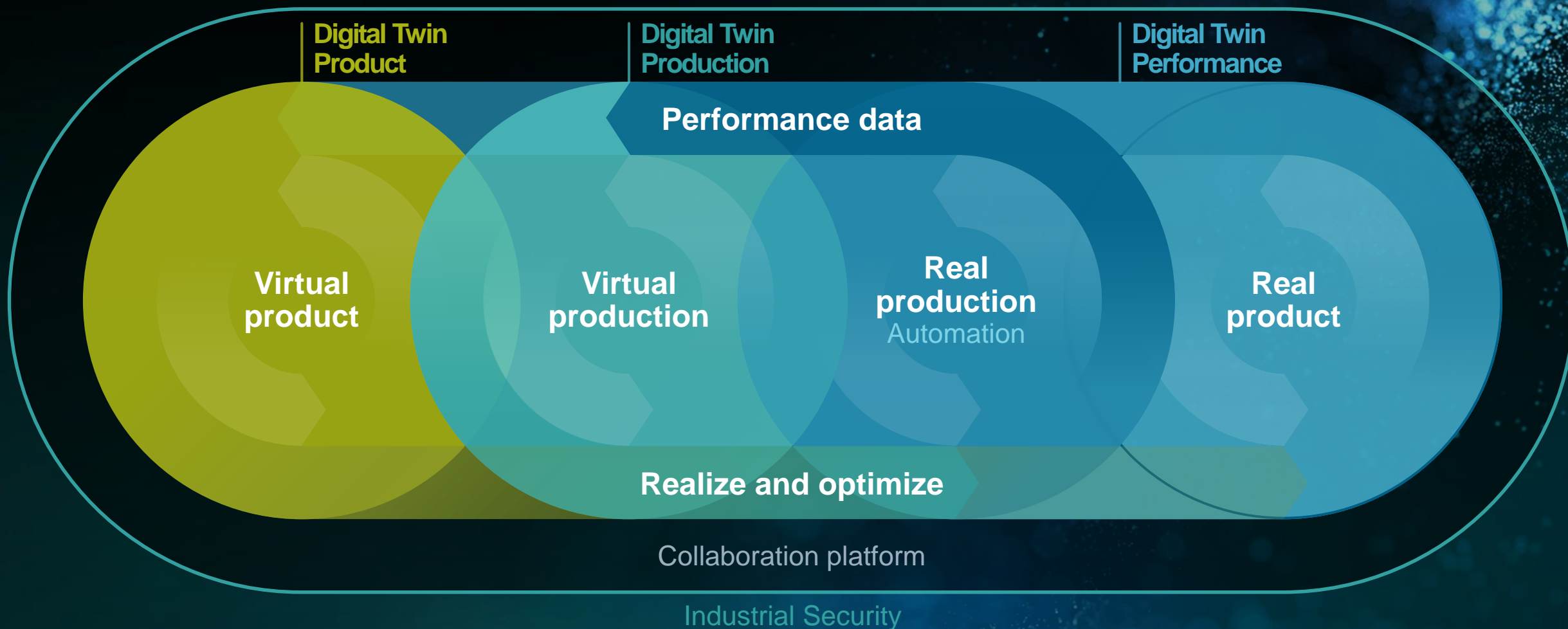
Comprehensive security concept

Modular factory

**Customized products**

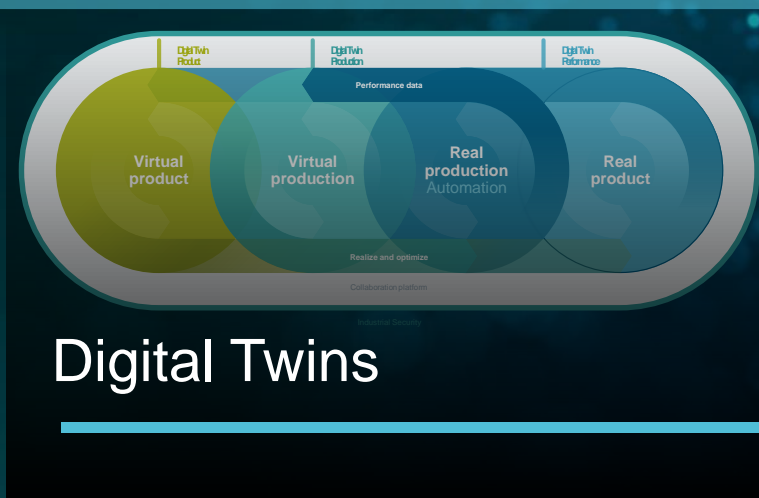
**Industry expertise**

# Siemens' comprehensive digitalization approach merges the virtual and real worlds





# Digital technologies and industry focus: With digital twins to increased productivity and value for our customers





**Customized products**

Security approach

Mass production

New business models

**Shorter times to market**

Digital Twins

# ADDITIVE MANUFACTURING

**Resource-saving**

Greater flexibility

Digital Enterprise

Speed

**Increased efficiency**

New manufacturing technologies



# From head to helmet: scaling industrial 3D printing with end-to-end digitalization

AM GLOBAL

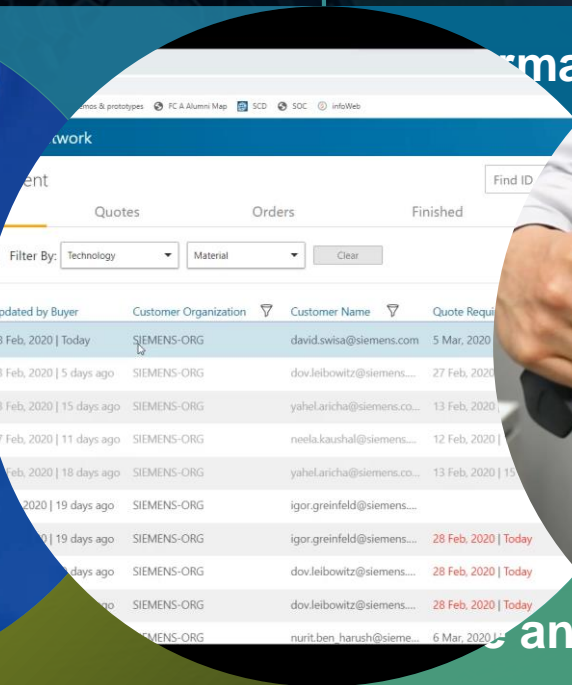


H X R

Digital Twin  
Product

Digital Twin  
Production


Digital Twin  
Performance



Collaboration platform

Industrial Security





**Digital Twins**

End-to-End Manufacturing

Industrie 4.0

Simulation

Flexibility

**Individualization**

**Digital technologies**

Innovation

**Increased productivity**

Process management

Highest quality

**Flexible customer solution**

**AEROSPACE**

# Digital twins improve helicopter rescue and help to save lives

Digital Twin  
Product

Digital Twin  
Production

Digital Twin  
Performance

Performance data



Realize and optimize

Collaboration platform

Industrial Security





**Maximize availability**

Highest reliability

Less energy consumption

**Virtually test, optimize real**

Faster from idea to innovation

# Intralogistics

Increased automation

**Save time and costs**

**Highly dynamic, space-saving storage  
and conveying technology**

Increased precision, product quality and dynamics



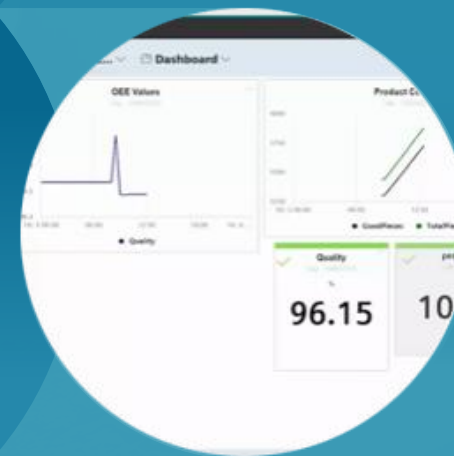
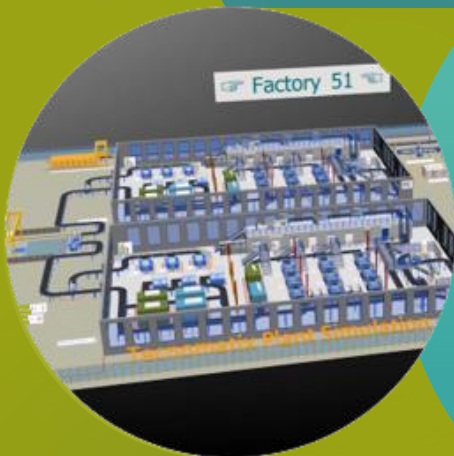
# With the digital twin to integrated and flexible intralogistics solutions

Digital Twin  
Warehouse

Digital Twin  
Material Handling

Digital Twin  
Warehouse

Performance data



Realize and optimize

Collaboration platform

Industrial Security

**New business models**

Knowledge from data

Scalable

**Analysis of  
high-frequency data**

Low latency times

Future-proof

Production process

Cloud

# **EDGE COMPUTING**

**Data processing close to the process**

SINUMERIK Edge

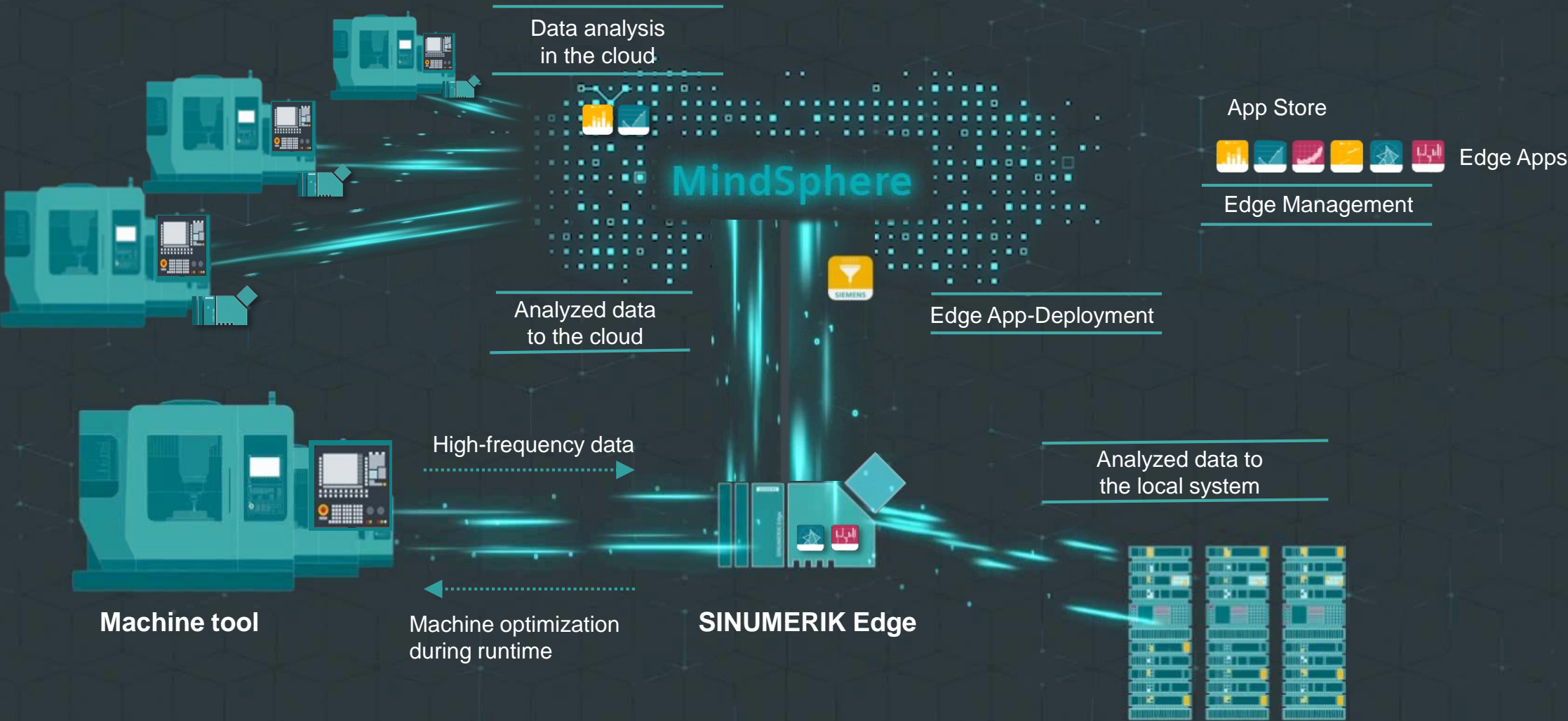
Develop new applications

**Industry-specific customer solutions**

Open platform

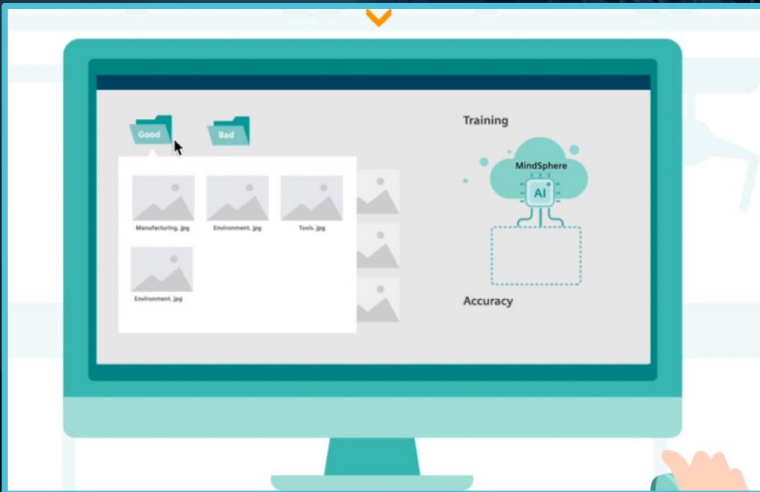


# Industrial Edge – increasing the performance of machines using powerful AI-based data analysis close to the process



# Increase productivity and minimize operating costs with Protect MyMachine /Vision

## Train



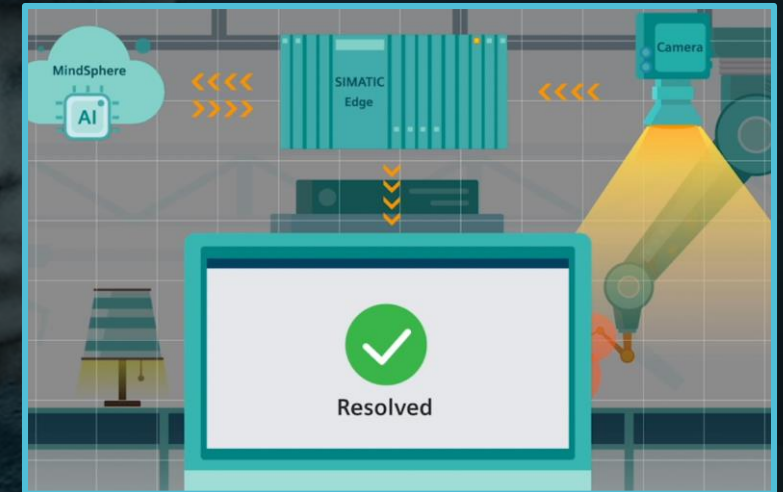
- Camera records images of inserted workpieces in a machine
- Trainable neural network (in the cloud) generates evaluation algorithms for images

## Transfer



- Transferring the algorithms to the SINUMERIK Edge computer
- High-performance evaluation of the scans in the ongoing process

## Apply & Compare



- Using Artificial Intelligence (AI) - analysis, evaluation and comparison of the workpiece photo
- Ensure:
  - Workpiece inserted correctly
  - Workpiece fits the loaded production program

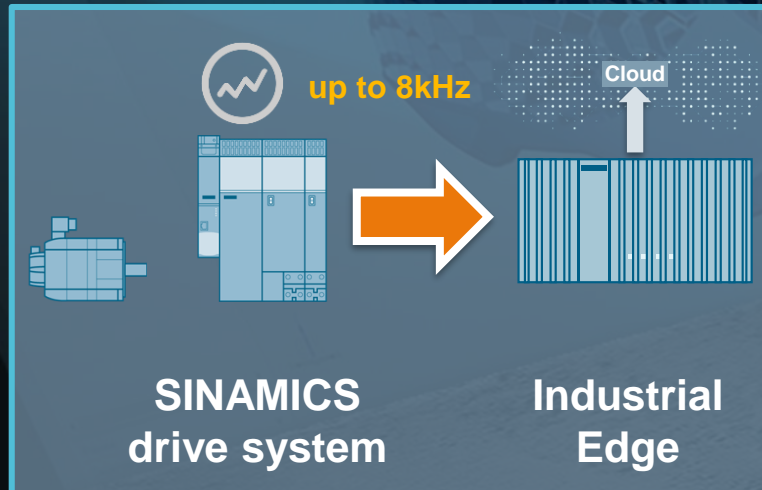


# Optimization of machines by analysis of highly granular data in the interaction of drive and industrial edge

Concept  
study

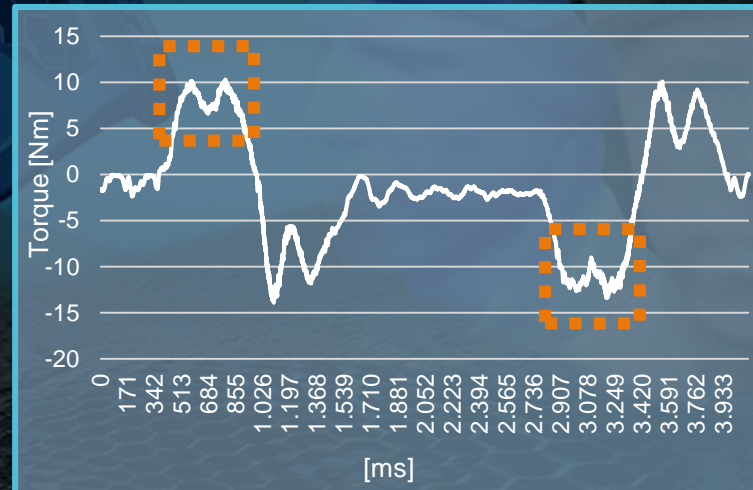


## Connect



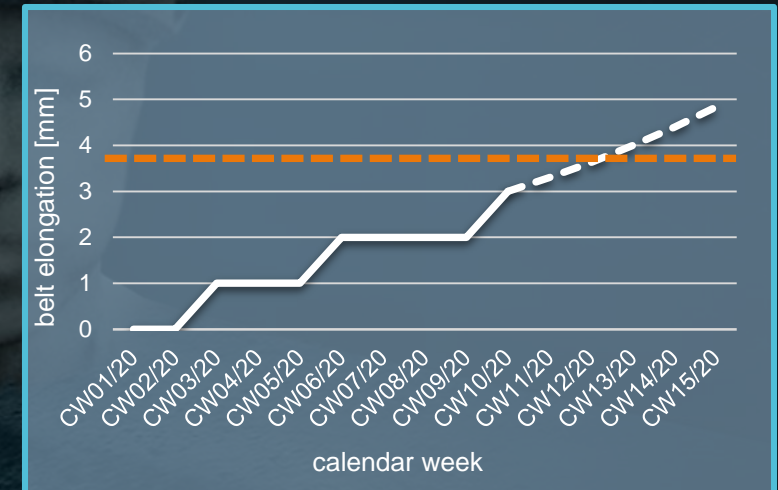
- All components can be configured plug-and-play TIA
- Connecting the drive system to the Edge platform
- Capture high-frequency data up to 8kHz

## Understand



- Analysis and monitoring of the powertrain on the Edge computer without additional sensors
- Leverage innovative machine learning algorithms to monitor the condition of powertrains and components

## Inform & Visualize



- Immediate notification of changes in the status of the drive system, e.g. by e-mail
- Long-term monitoring of drives in the cloud, e.g. with MindSphere and Analyze MyDrives



**Productivity**

**Generate knowledge from data**

Analysis of high-frequency data

Availability

**Analysis of motor data in the cloud**

# **DRIVE TECHNOLOGY**

Connectivity

**Application expertise**

New business models

**Optimization of energy efficiency**



# Drive technology – highlights

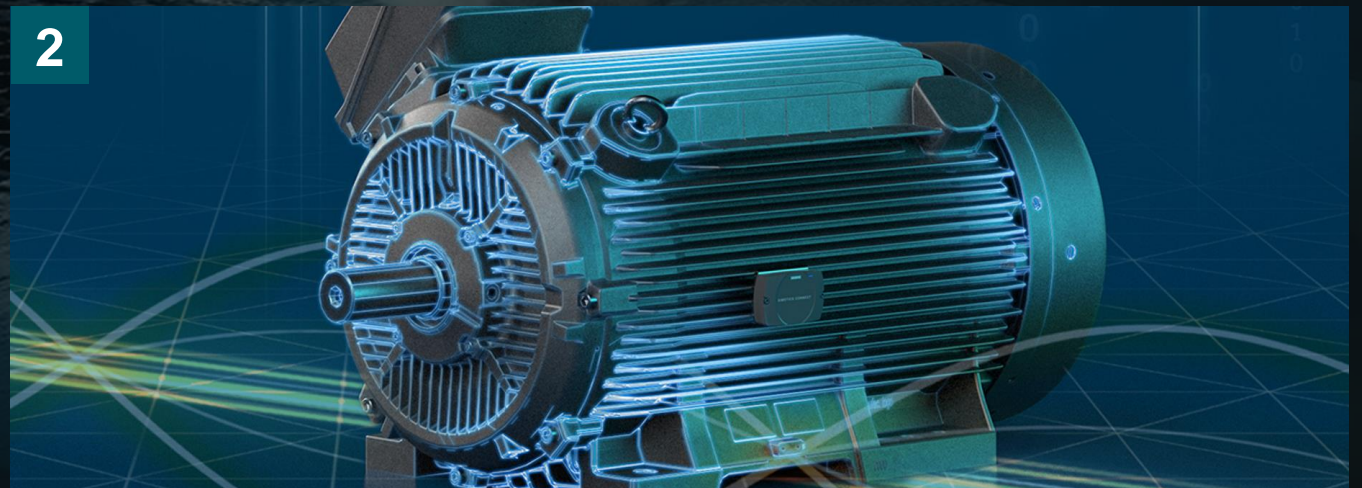
## New frequency converter generation **SINAMICS G115D** specifically for intralogistics

- Compact drive system with application-specific functions (e.g. self-executed package stops) for intralogistics
- Easy engineering through integration in the TIA Portal

1



2

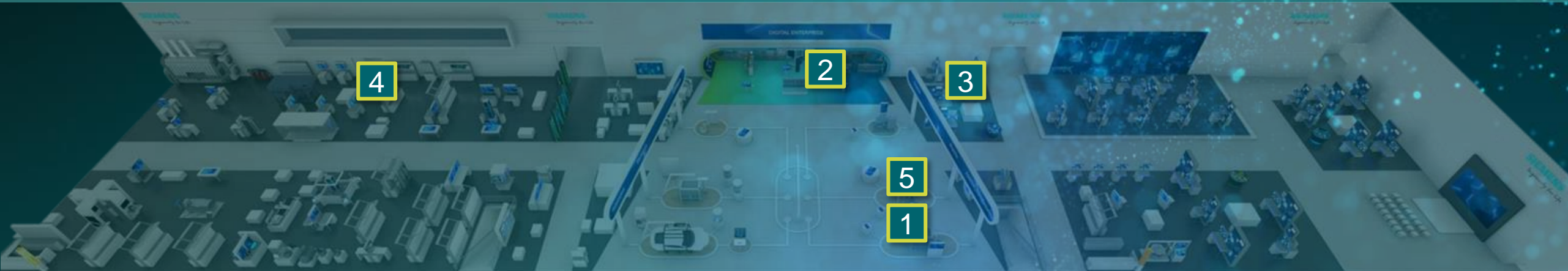




# Motion Control – Taking the next step

<b>Additive Manufacturing</b>  1	<b>Intralogistics</b>  2	<b>Edge Computing</b>  3	<b>Drive Technologies</b>  4	<b>Aerospace</b>  5
--	---	--	--	---

Meet us at Hannover Messe!







# Factory Automation – Taking the next step

Rainer Brehm | CEO Factory Automation







## Automotive Showcase – more flexibility with end-to-end solutions for the automotive industry

Implementation of complete conveyor technology by Siemens in 4.5 months – record time

---

Maximum flexibility through the use of automated guided vehicle systems

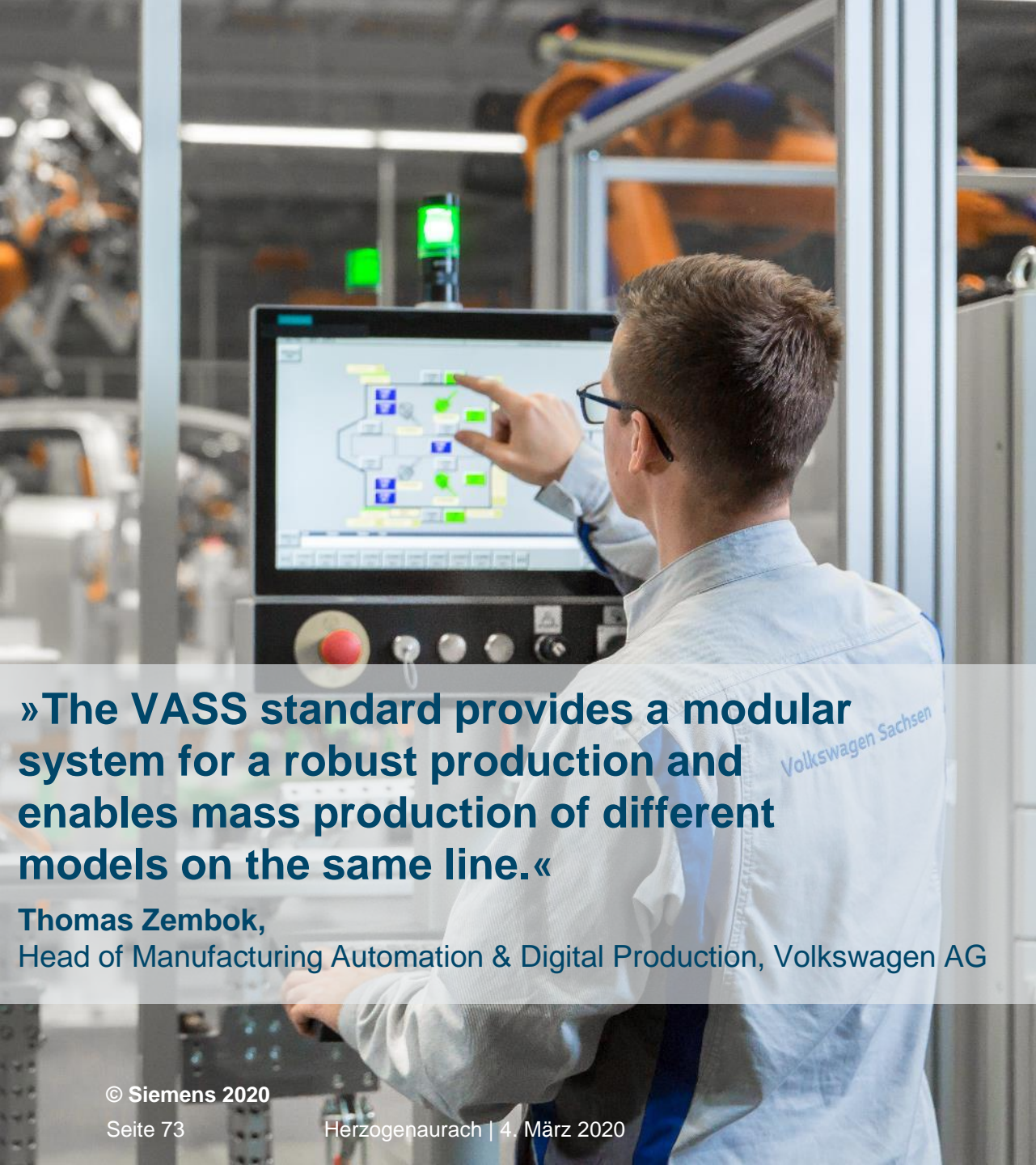
---

Automation entirely based on SIMATIC and SINAMICS drive technology from Siemens

**“Installing this type of manufacturing in downtown Zuffenhausen is a huge challenge in itself.”**

**Albrecht Reimold, Member of the Board at Porsche AG**





## Siemens supports Volkswagen for building a digitalized eCar-production based on VASS standard

Volkswagen and Siemens develop the standard for production of future eCar generations together

---

Volkswagen's first eCar of the new generation will be produced with automation technology from Siemens

---

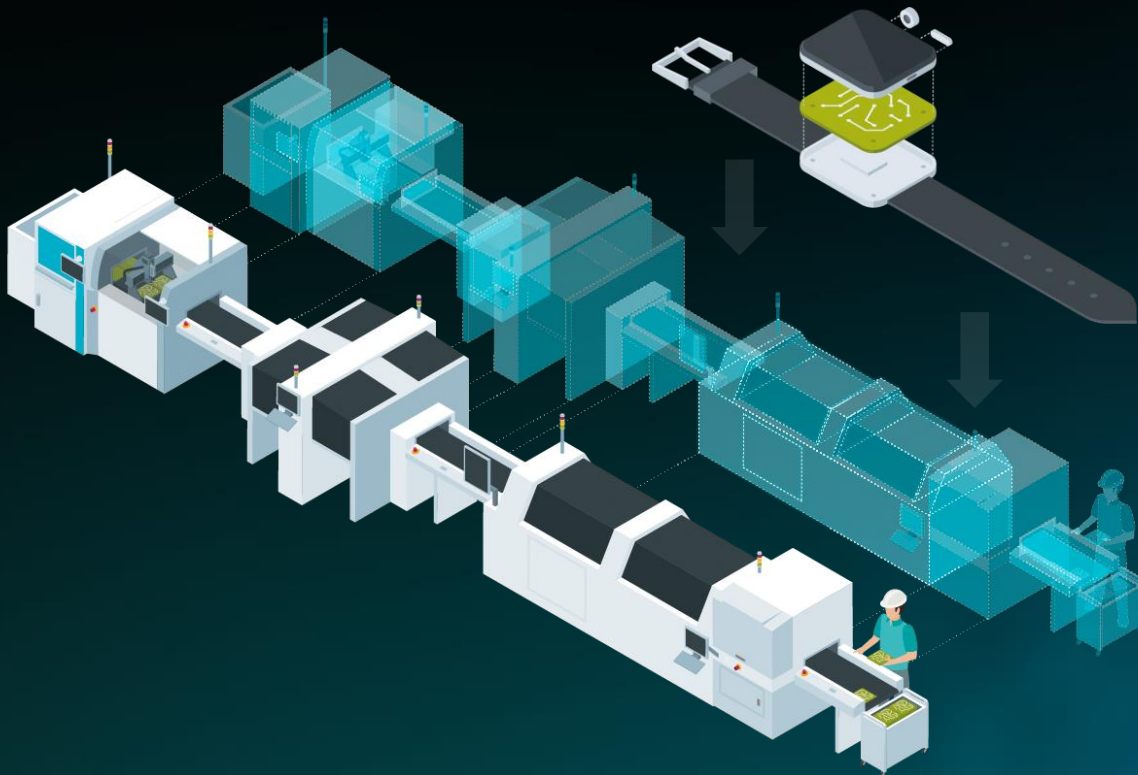
Degree of automation in the body shop is aimed to be increased to 89 percent

**»The VASS standard provides a modular system for a robust production and enables mass production of different models on the same line.«**

**Thomas Zembok,**  
Head of Manufacturing Automation & Digital Production, Volkswagen AG



Example of a smart watch production - from design and production planning through to real production



More flexibility and 30% time savings through increased engineering efficiency

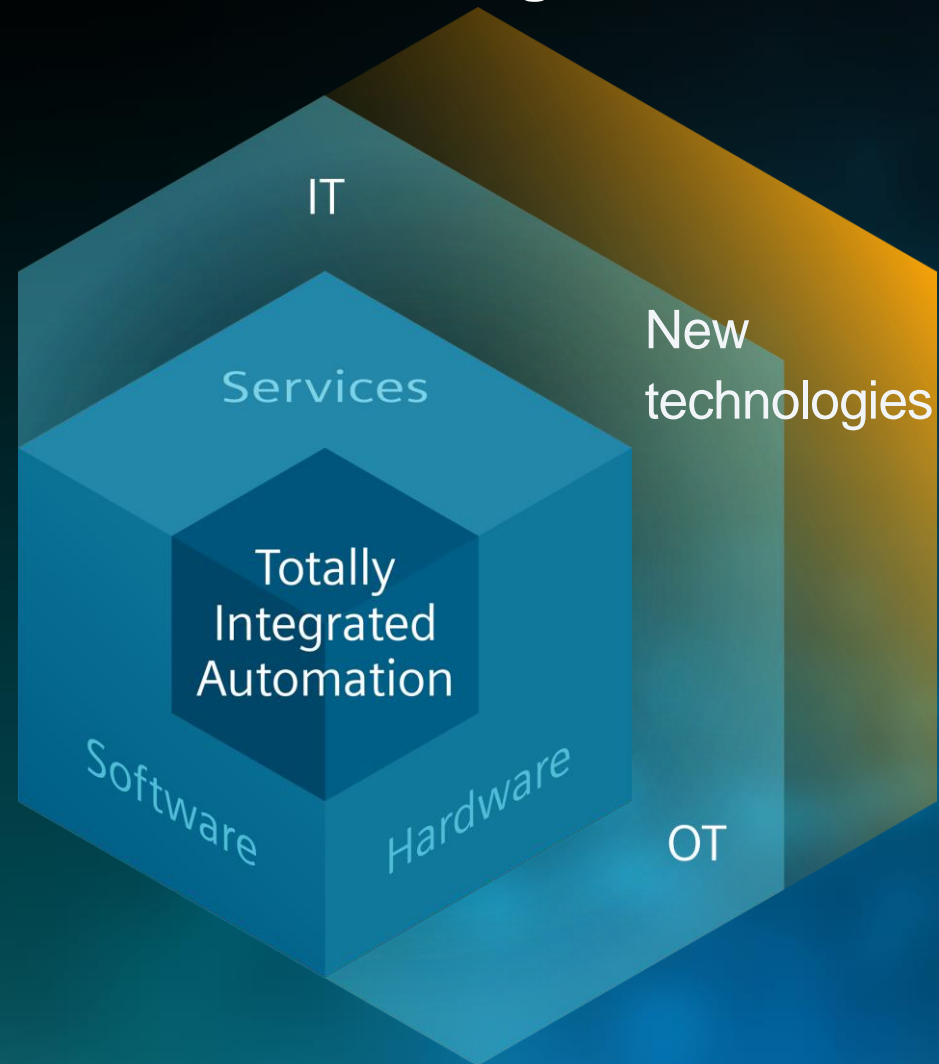
## Electronics Showcase – faster time-to-market with end-to-end solutions for the electronics industry

Faster time-to-market: early troubleshooting through simulation and virtual validation of product and production

More flexibility thanks to seamless tool chain: feeding product updates quickly, easily and seamlessly into the design and production flow

More flexibility: automation solutions that support machine concepts for fast product modifications.

# Taking the next step in automation – Integration of OT and IT with new technologies





# SIMATIC WinCC Unified System

## Visualization and Manufacturing Integration Platform



Fundamentally newly developed visualization system in TIA Portal for panel and PC systems



Visualization based on modern web technologies from the machine to the control system. Scalable functional scope through SCADA and Plant Intelligence options.



Open hard- and software interfaces for data exchange and the integration of 3rd party services



New generation of high-end operator panels "SIMATIC HMI Unified Comfort Panels", with multitouch and integrated edge functionality



SIMATIC WinCC Unified V16



SIMATIC HMI Unified Comfort Panels

# SIMATIC Controller

## Cloud connectivity - from the smallest to our largest PLC

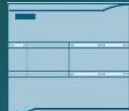
IT/Cloud  
level



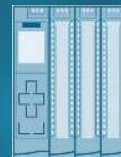
Programmable Logic Controller with IoT functionality



LOGO!



SIMATIC  
S7-1200

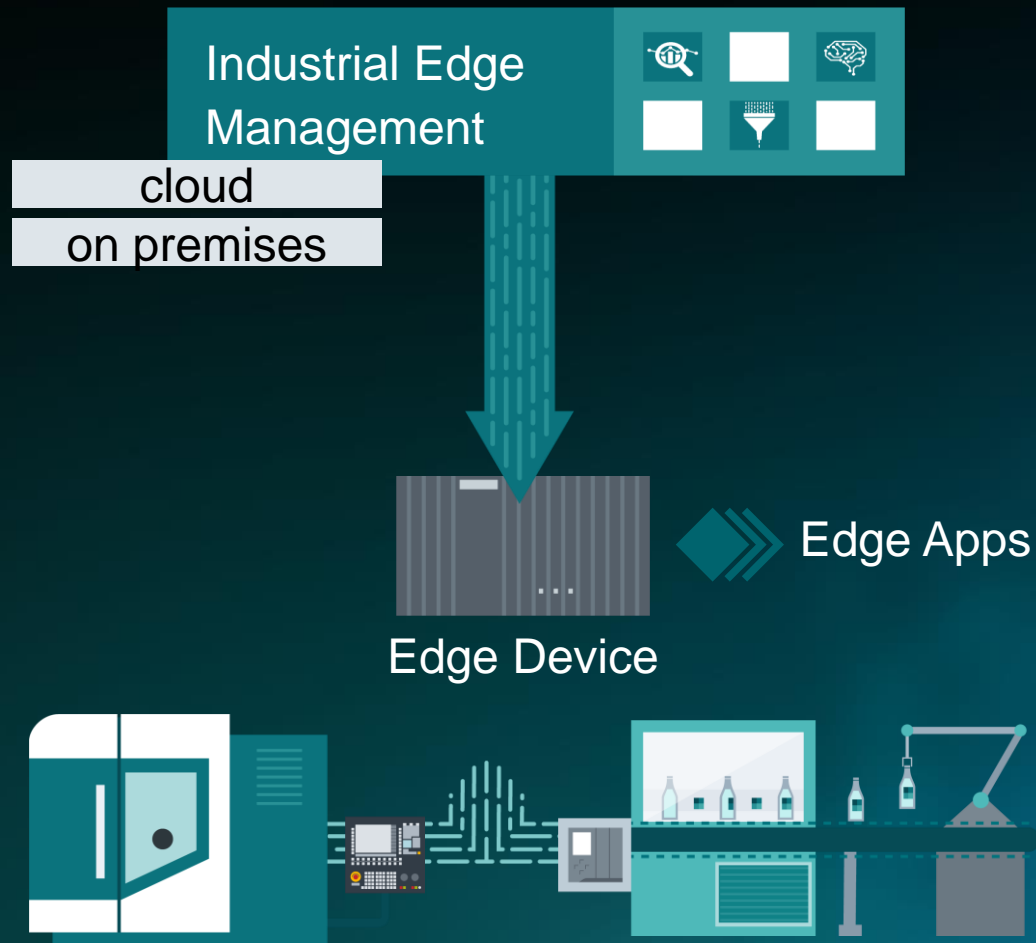


SIMATIC  
S7-1500

- Scalable portfolio, openness for all cloud platforms by using the MQTT protocol
- Evaluation of key indicators allow reduced downtimes, optimized maintenance and increased availability
- Enables new business models (e.g. payment options, additional services)



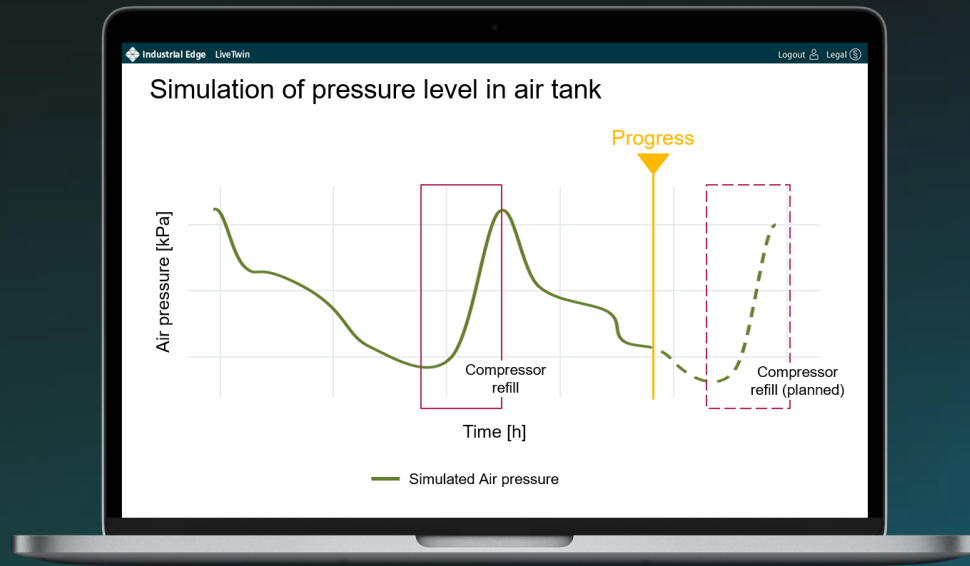
# Industrial Edge expands industrial automation with new data processing capabilities to integrate IT



- The interoperable Industrial Edge system enables its participants to integrate
  - Industrial Edge applications and
  - Industrial Edge devicesinto the production environment.
- Standardized container technology (Docker) supports app integration without additional hardware configuration.
- Consumers benefit by simply managing apps and devices from various vendors in one open platform.

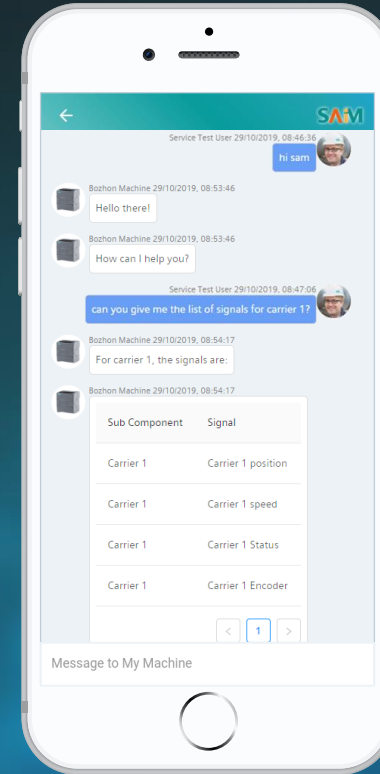
# SIMATIC Edge Applications

Data processing, visualization and analysis at field level



## SIMATIC LiveTwin

- Simulation models running on Edge layer
- Implementation of virtual sensors
- Virtual control loop



## SIMATIC Assistant for Machines (SAM)

- Connection of all machine information over various sources
- Fast and easy availability of machine information
- Shorter response time for customer service and support



# Factory Automation – Taking the next step

## TIA Portal V16 and Continuous Integration

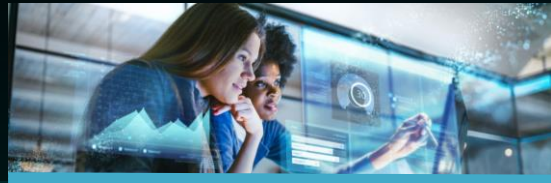
Increase software quality and reduce engineering costs



## SIMATIC WinCC Unified System

New

Limitless visualization for every application, plant intelligence options



## SIMATIC Drive Controller

For extremely flexible Motion Control applications



## SIMATIC Controller

New

Comprehensive cloud connectivity – from the smallest to our largest PLC



## Meet us at Hannover Messe!

## TIA - Line Integration

Standardization as the basis for the perfect integration of machines



## Industrial Edge

New

Expands automation with new data processing options for IT integration



## SIMATIC IOT 2050

New

Intelligent gateway and data collector for industrial IoT applications



## Artificial Intelligence

New

New technologies shape the future of automation





# Thank you.

**Siemens press conference**  
March 4, 2020



# Siemens press conference

Digital Enterprise – Taking the next step

March 4, 2020