



# Factory Automation Tour

Start lifting off from automation to the future

# Who are we...?



**Peter Bornerup**  
Head of Business Unit –  
Factory Automation

**Lars Peter Hansen**  
Technology Specialist  
Manager

**Ulf Lindhard**  
Technology Manager

## Trends in Automation

**Flexibility**

**Quality**

**Speed**

**Productivity**

**Sustainability**

**Business models**

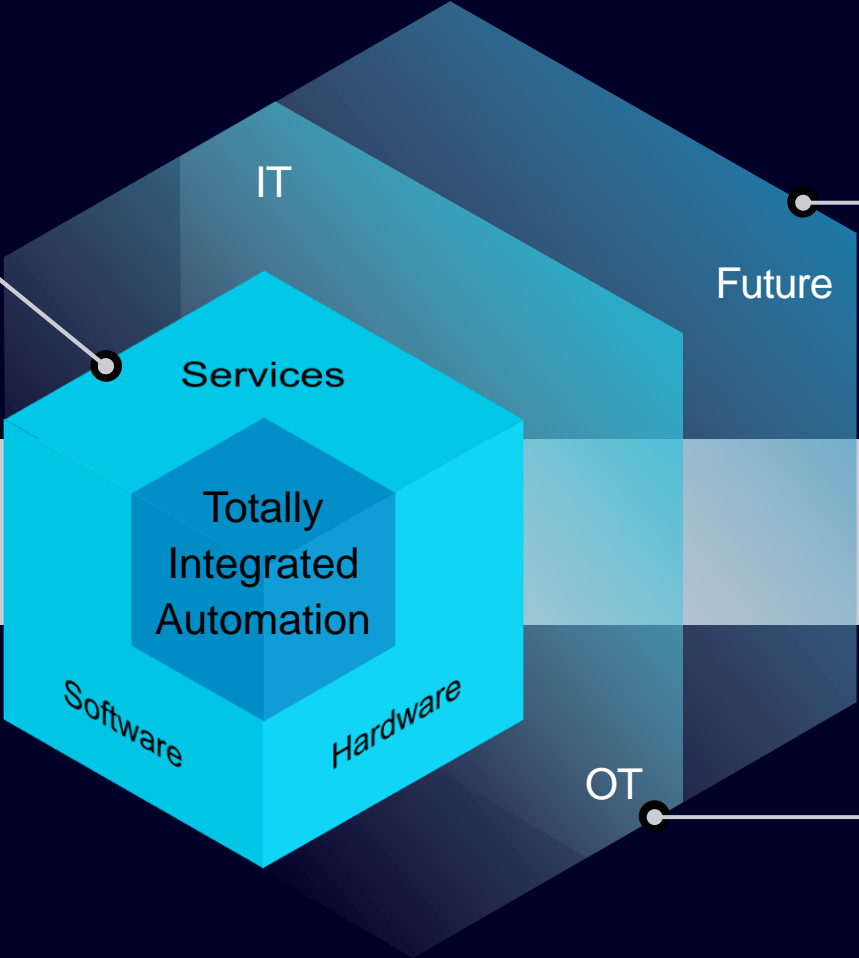
# Totally Integrated Automation from Siemens

A secure investment for the future!

## Integration<sup>1</sup>

TIA core

For maximum consistency and transparency  
Hardware and software portfolio with values and services



## Integration<sup>3</sup>

The future of TIA

Step by step integration of new technologies for a future proof investment  
Evolution with Future of Automation

## Integration<sup>2</sup>

TIA in the Digital Enterprise

Connectivity all the way – from OT to IT  
Digital transformation made easy by TIA use cases

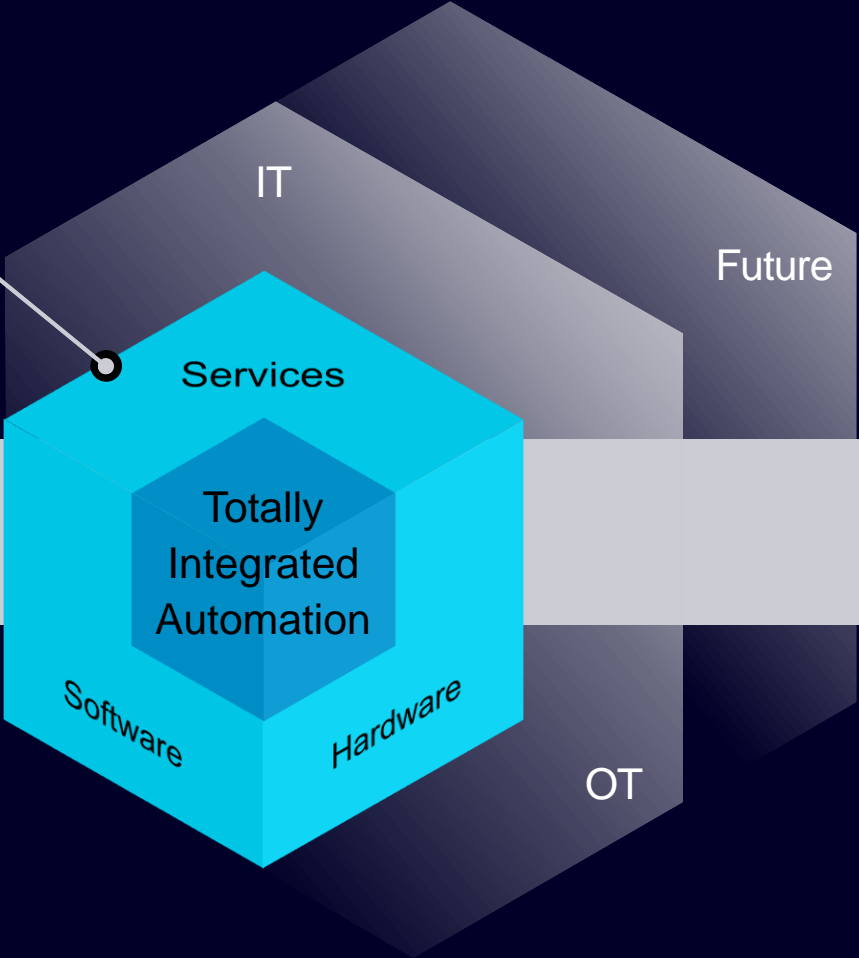
# Totally Integrated Automation - Integration<sup>1</sup>

Seamless interaction of all components & competences

## Integration<sup>1</sup>





TIA core

Hardware and software portfolio with values and services







# Totally Integrated Automation – Current range of products and solutions

Information Technology (IT)

 Industrial Edge Market	 MindSphere	 Applications	 Digital Twin Cloud Services
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Cloud

 Operations Management	 Plant Lifecycle Management System	 Operations Intelligence	 Simulation
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Management

 Industrial Edge Management System	 SCADA	 Network Management	 Automation Engineering System	 Process Control Systems	 Energy Management	 Maintenance
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Operation

 Controller	 HMI	 IPC	 Industrial Communication	 Motion Control	 CNC
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Control

◆ Edge enabled devices

 Power Supply and Distribution	 Industrial Controls	 Distributed I/O	 Drive Systems	 Industrial Identification & Locating	 Process Instrumentation	 Process Analytics	 Weighing and Dosing
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Field

Operational Technology (OT)

**SIEMENS**

# TIA system solutions

Resulting in real customer added values



**Integrated Engineering**



**Data Intelligence**



**Industrial  
Communication**



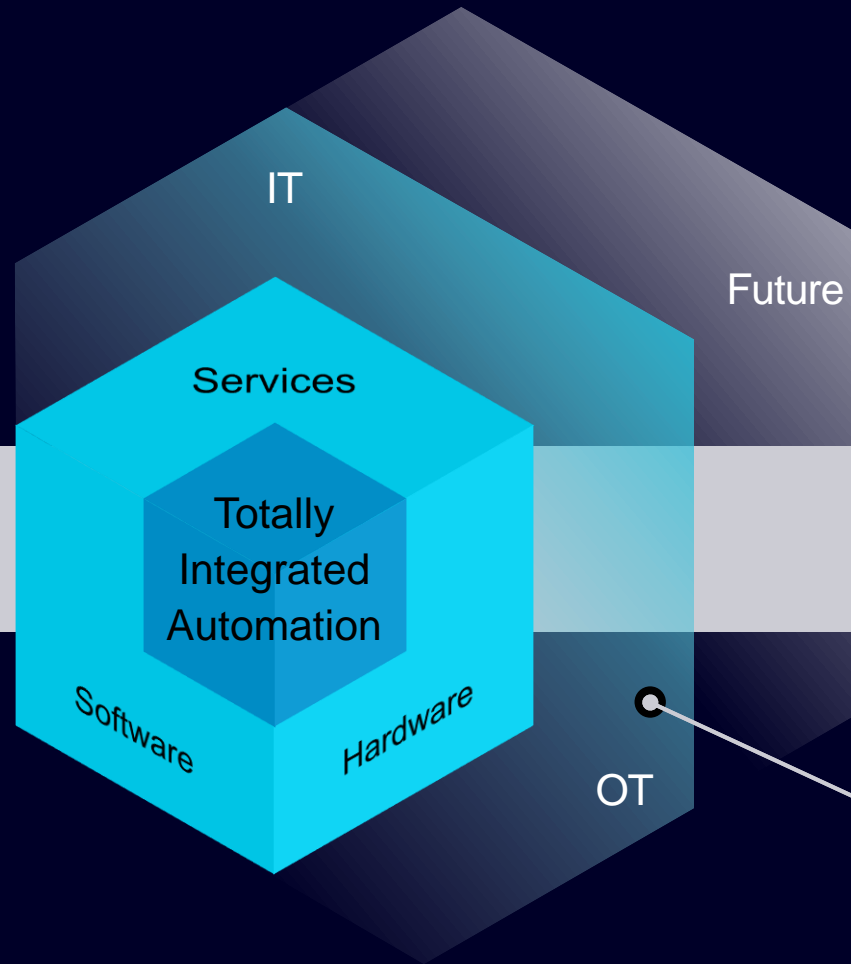
**Industrial Security**



**Safety Integrated**

# Totally Integrated Automation - Integration<sup>2</sup>

Enabling the realization of the Digital Enterprise



**Integration<sup>2</sup>**  
TIA in the Digital Enterprise

**Connectivity all the way –  
from OT to IT**

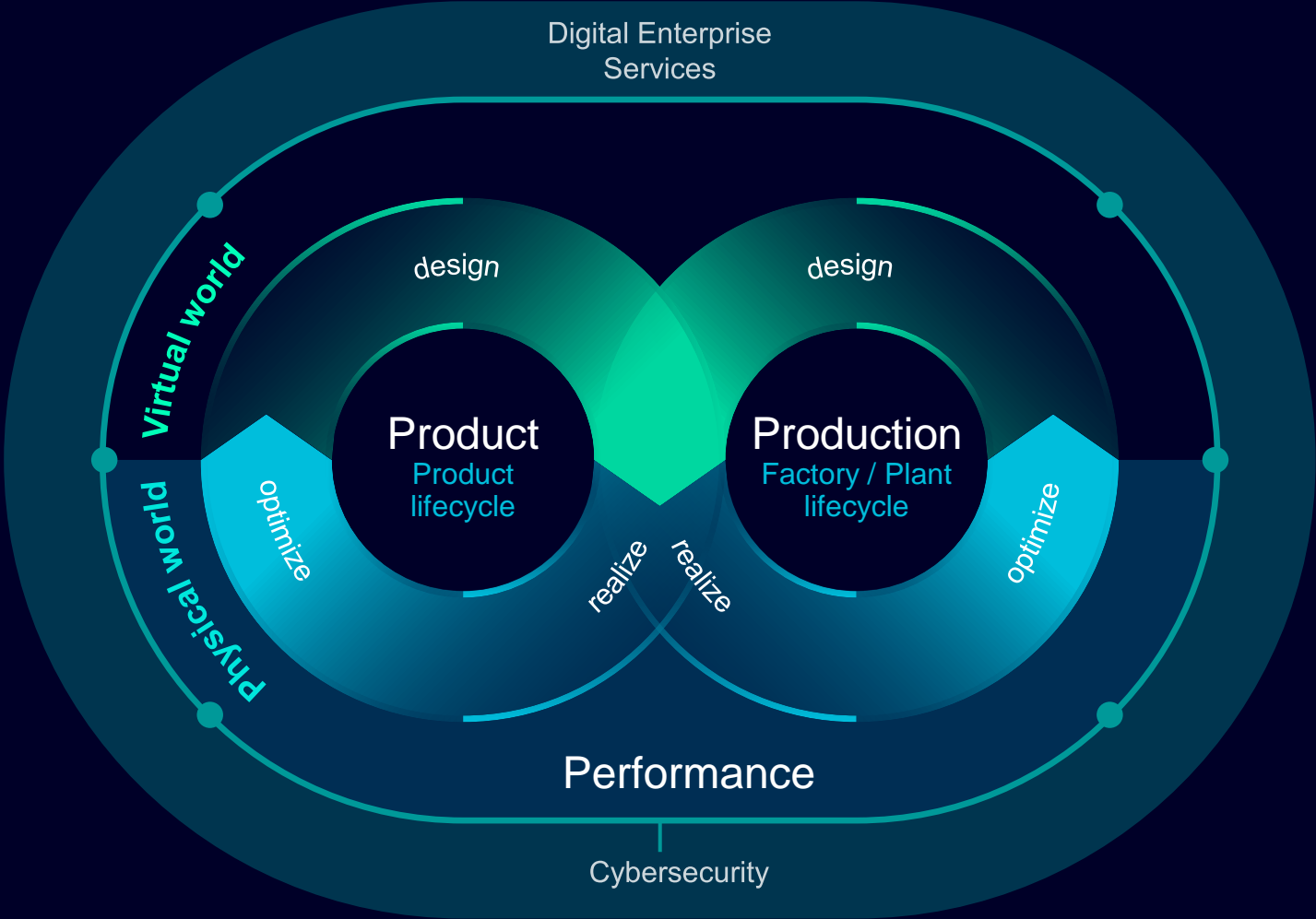


# Digital Enterprise – Combining the real and the digital worlds

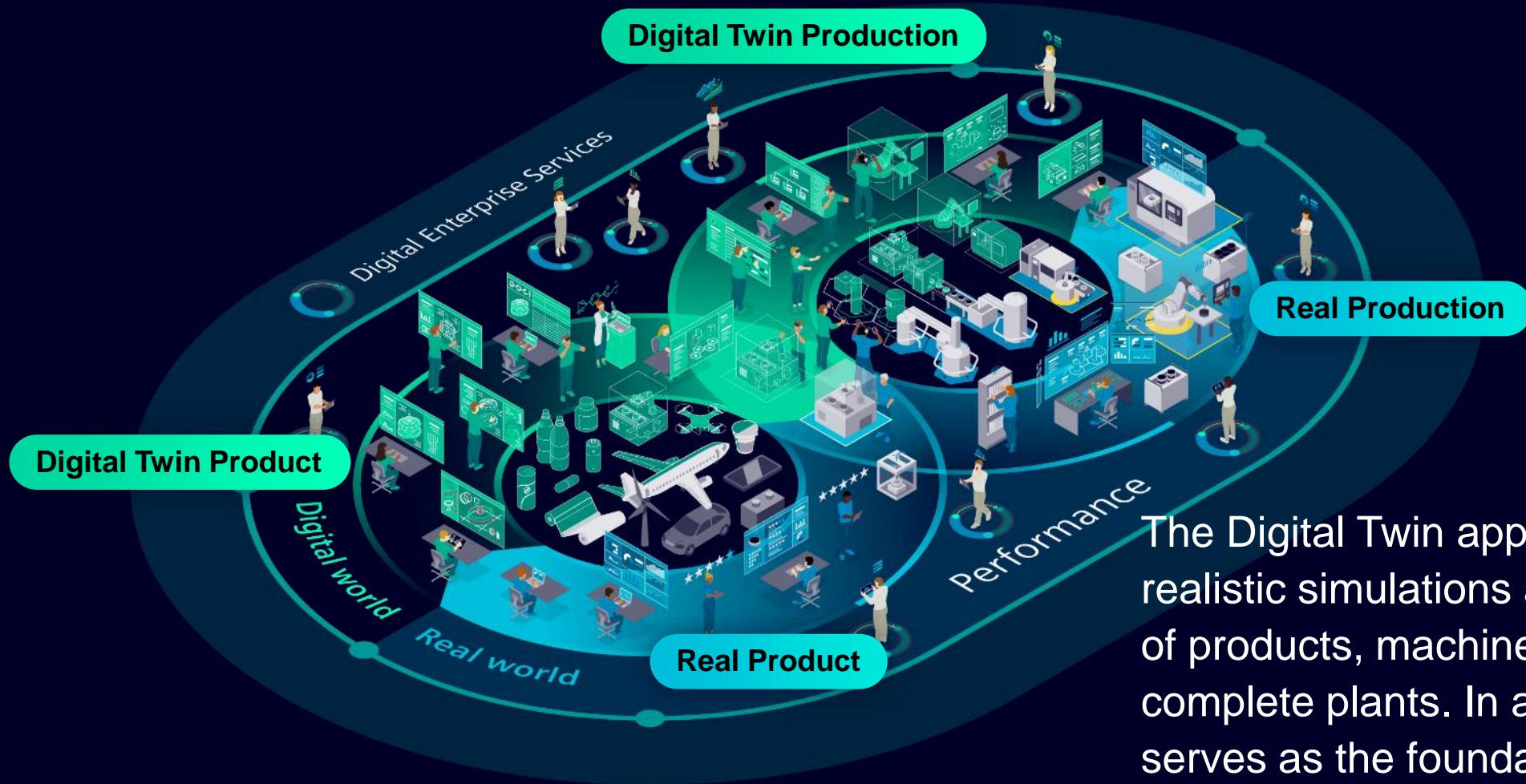


# Totally Integrated Automation in the Digital Enterprise

Connecting the virtual and real world today, for continuous optimization

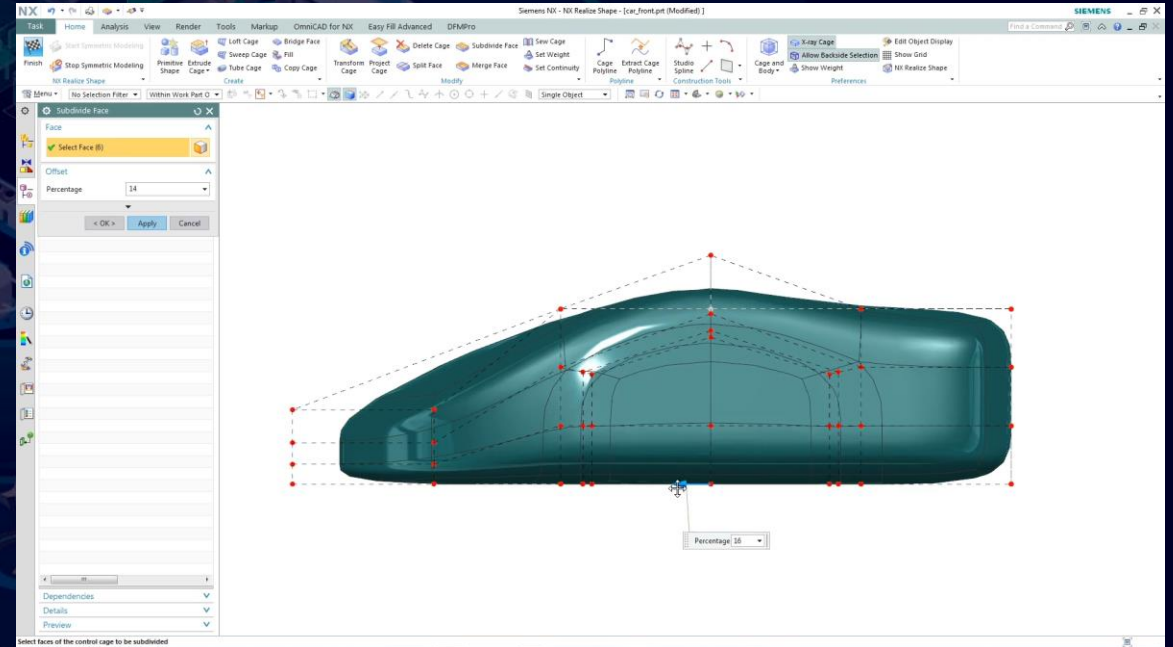


# Horizontal Integration



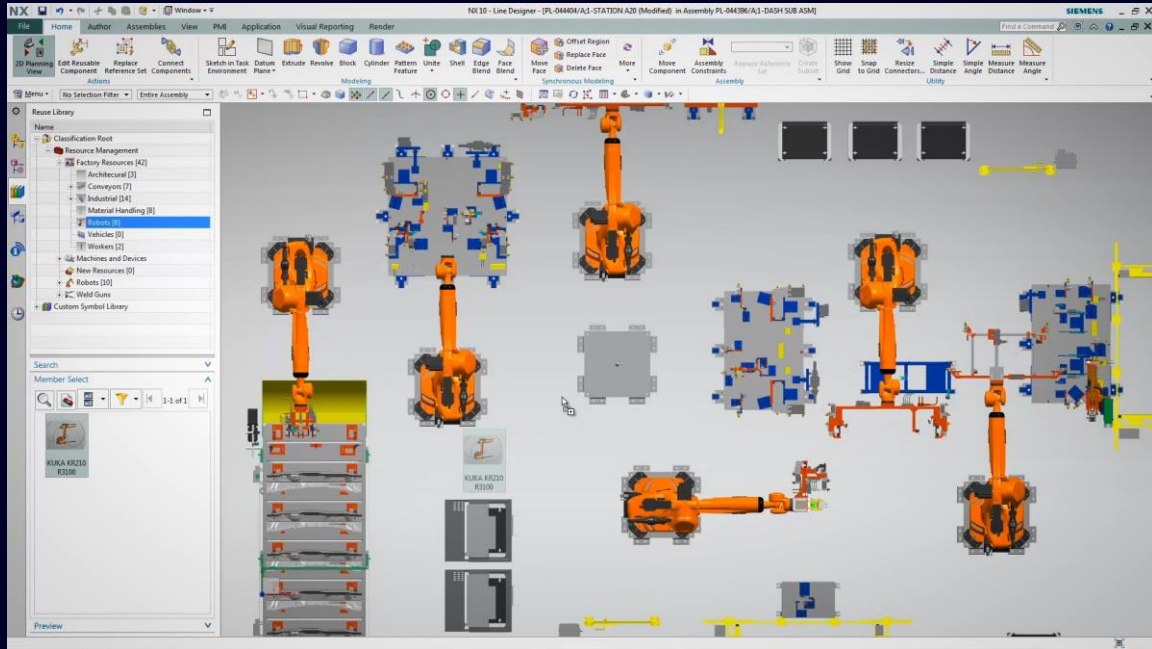
The Digital Twin approach allows realistic simulations and validation of products, machines, lines and complete plants. In addition, it serves as the foundation for flexible and efficient manufacturing.

# Horizontal Integration – The Digital Twin Product



Design, simulate, and verify products digitally, including mechanics and multi-physics, electronics and management of software.

# Horizontal Integration – The Digital Twin Production



Plan, simulate and optimize production digitally with PLC code generation and virtual commissioning.

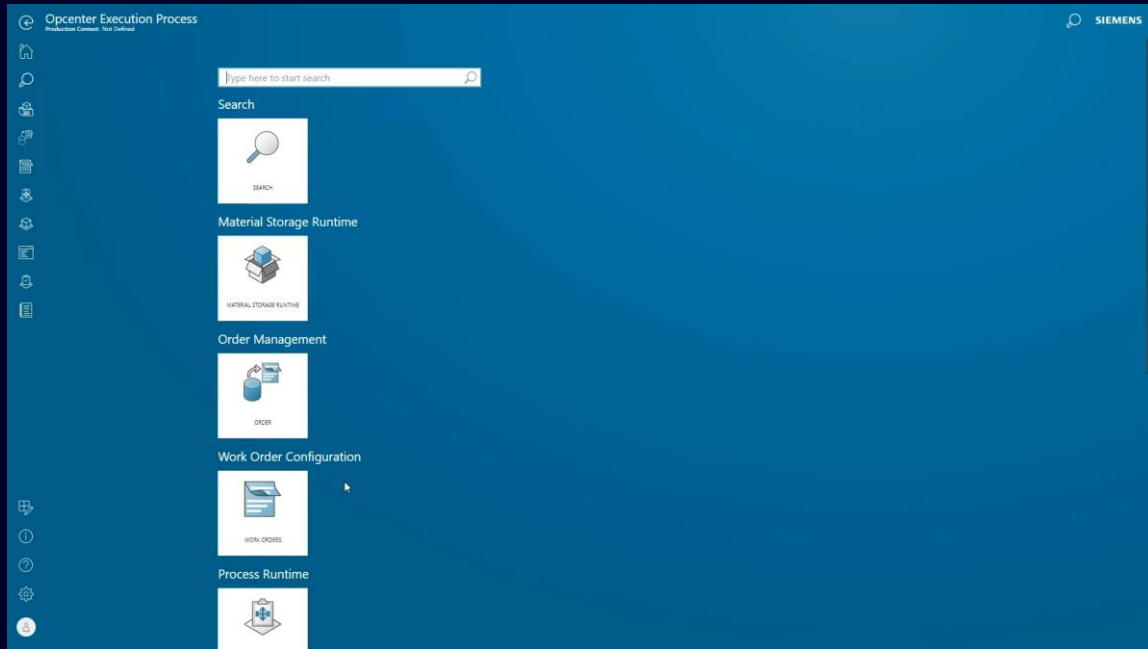


# Horizontal Integration – Combining real and digital



Get things right the first time –  
thanks to simulation and validation

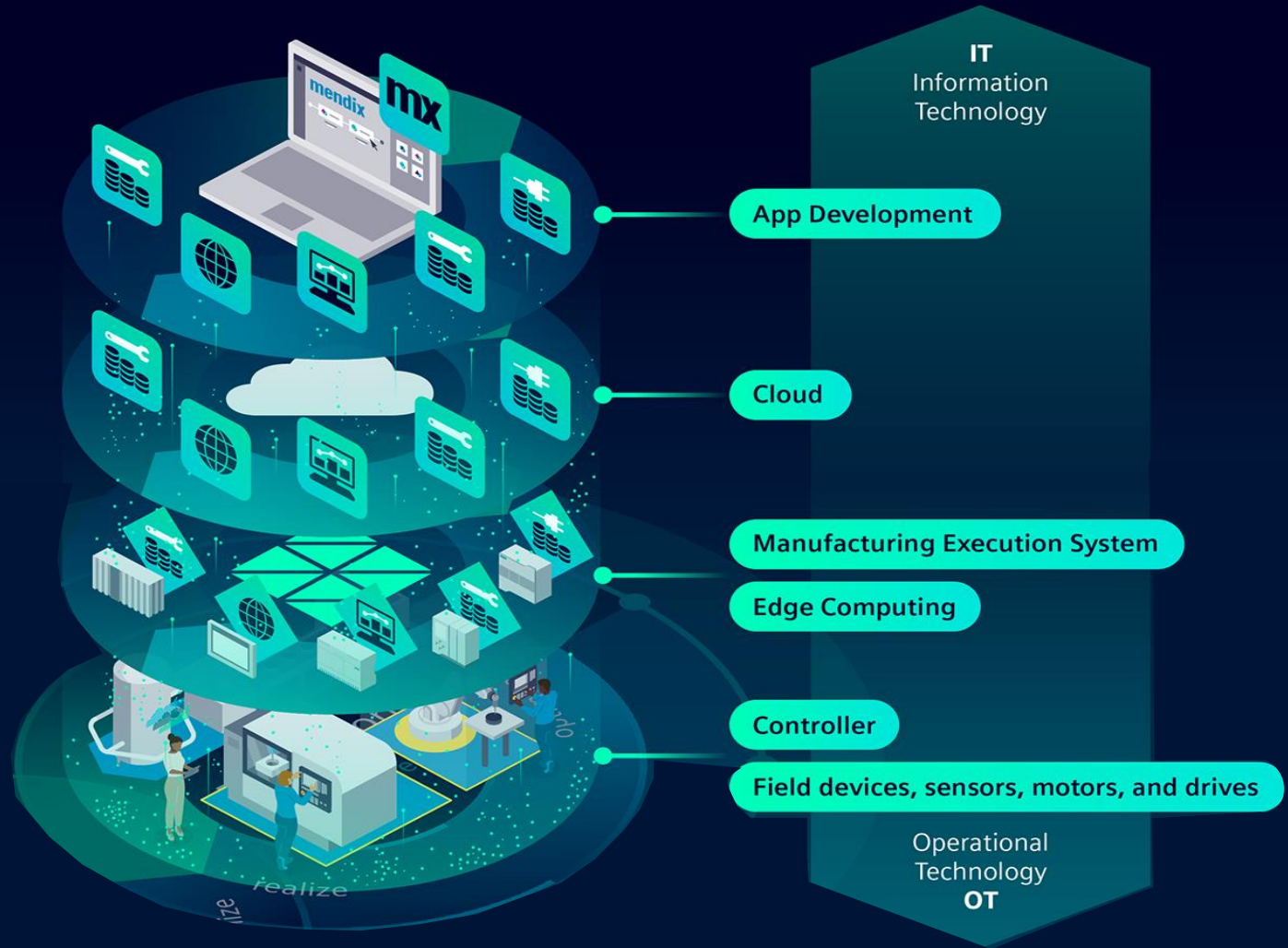
# Horizontal Integration – The real product and production



Run production efficiently and securely with  
Totally Integrated Automation and optimize  
product and production with data insights.

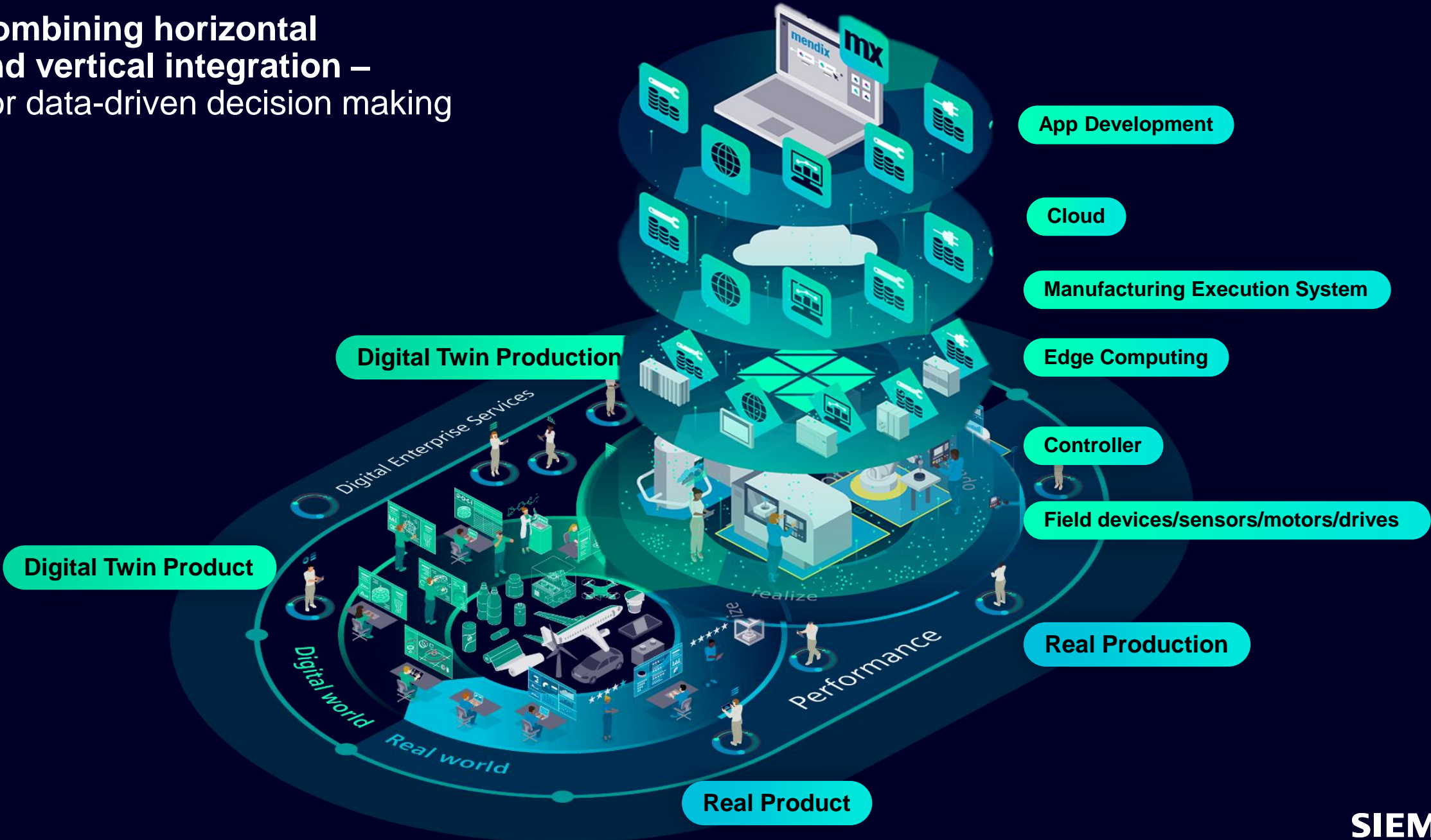


**Vertical Integration –**  
helps you to innovate and compete  
from sensor to edge to cloud



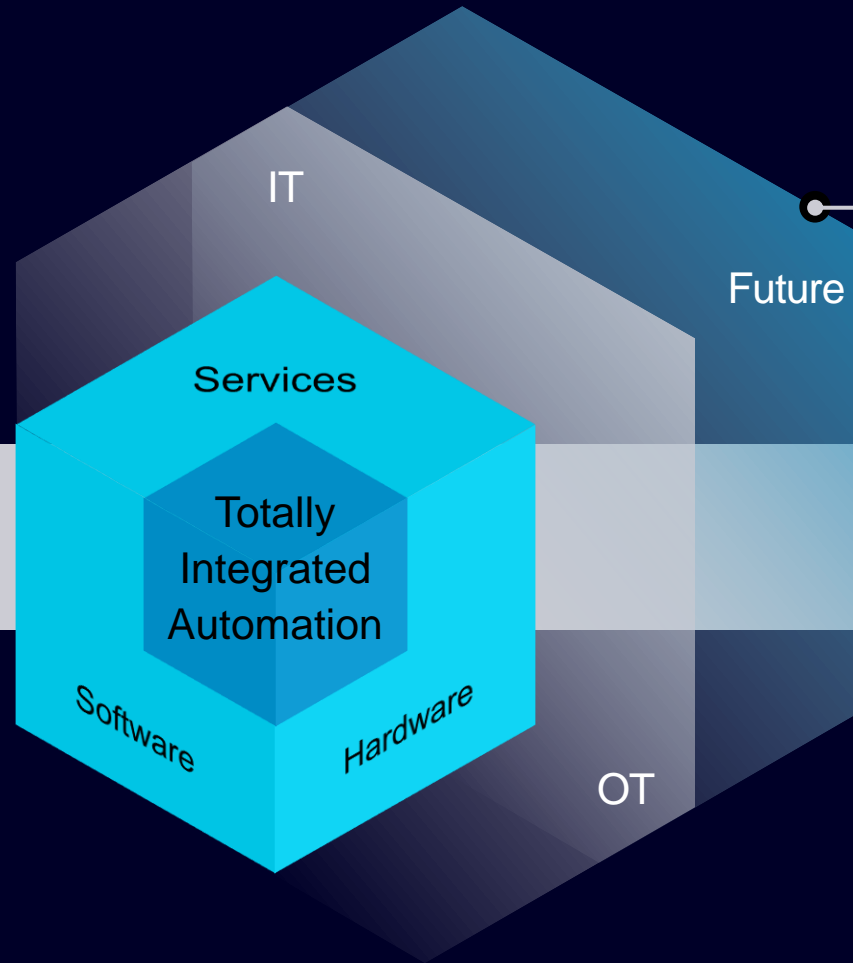


# Combining horizontal and vertical integration – For data-driven decision making



# Totally Integrated Automation - Integration<sup>3</sup>

Thinking about tomorrow today - Concepts for the next 3-5 years



## Integration<sup>3</sup>

The future of TIA

Step by step integration of new technologies in the TIA core

# Totally Integrated Automation & Future technologies

Step-by-step we are making our vision of an autonomous factory a reality

Using disruptive technologies to pave the way for an autonomous factory



**Blockchain**



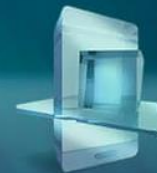
**5G**



**Edge &  
Cloud  
Computing**



**Autonome  
Systems**



**Augmented  
Reality**



**Artificial  
Intelligence**



**Automation  
Technology**



Vision

# The autonomous factory

New machine concepts  
for a flexible and sustainable production

Enhanced by

AI

5G

Blockchain

Edge and cloud computing

Systems that learn from conditions  
self-organized - self-adapted - self optimized

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**Industry faces fast-changing market demands –  
creating value for our customers**

**Flexibility**

**Quality**

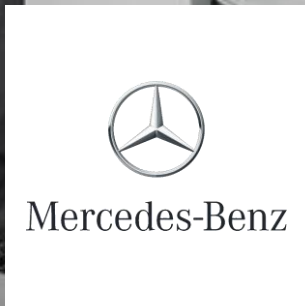
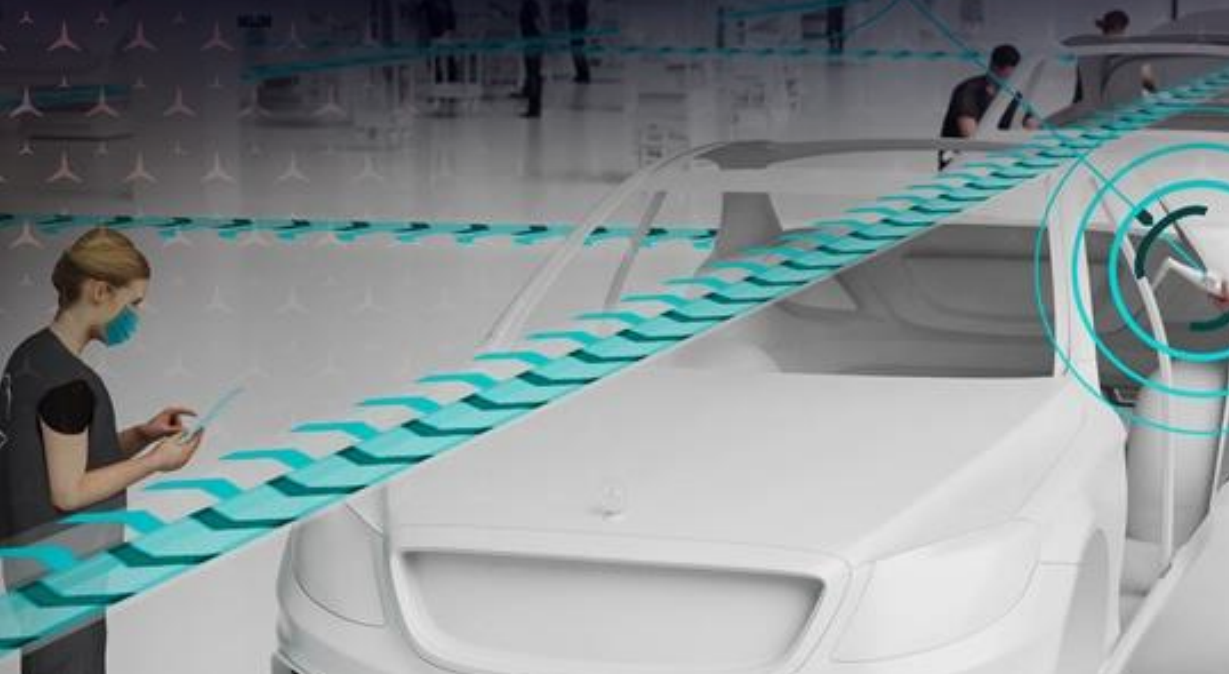
**Speed**

**Productivity**

**Sustainability**

**Business models**

# Flexibility Sustainability



COMPANY CORE  
TECHNOLOGY  
**Simulation  
& Digital  
Twin**

COMPANY CORE  
TECHNOLOGY  
**Connectivity  
& Edge**

MERCEDES-BENZ

## Partnership to digitally enhance existing Mercedes-Benz factories

### Customer challenge

- Mercedes-Benz and Siemens to expand the digitalization of sustainable production methods

### Solution

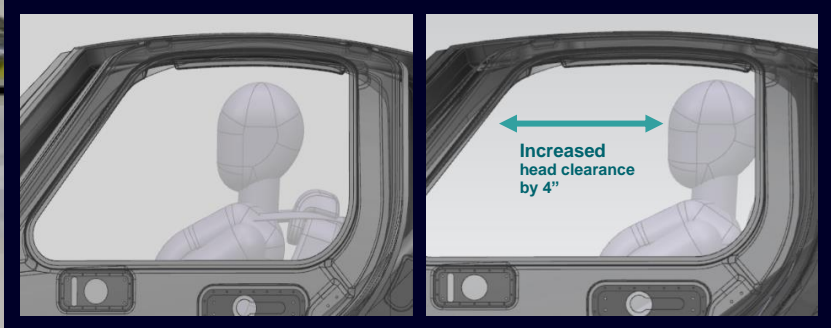
- Partnership to develop innovative solutions for:
  - Digital end-to-end technologies for flexible production
  - Resource-saving, CO<sub>2</sub>-neutral factories
  - New working environments

### Customer benefit

- Create new Mercedes-Benz Digital Factory Campus in Berlin as a blueprint
- Roll-out of new developments at all Mercedes-Benz plants

**SIEMENS**

# Productivity



COMPANY CORE  
TECHNOLOGY  
**Simulation  
and Digital  
Twin**

BYE AEROSPACE

## Reducing product development time for all-electric composite aircraft

### Customer challenge

- Develop and deliver aircraft with low operating costs, low noise and no CO<sub>2</sub> emissions for general aviation
- Optimize plane stability while working from home

### Solution

- Leverage a comprehensive digital twin

### Customer benefit

- Reduced product development time
- Decreased engineering effort by 66%
- Only 7 days to re-design, test and create reports for certification through digital twin

# Speed

BIONTECH

COMPANY CORE  
TECHNOLOGY

**Data  
Analytics  
& AI**

COMPANY CORE  
TECHNOLOGY

**Simulation  
& Digital  
Twin**

BIONTECH

## Vaccine against Covid within one year – from development to release to production

### Customer challenge

- Rapid production of Covid-19 vaccine in large quantities

### Solution

- Paperless documentation of development and production, immediately fulfilling all documentation requirements

### Customer benefit

- Accelerated vaccine development and production within one year
- Conversion time for existing production facility cut from one year to five months

SIEMENS