SIEMENS
Ingenuity for life

5G

JanMrosik

Beyond Industry 4.0

Driving the Digital Enterprise

Dr. Jan Mrosik, Chief Operating Officer, Siemens Digital Industries
Stockholm, January 28, 2020

siemens.com/digital-enterprise

Welcome to a **world leader** in **digitalization**

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Welcome to **Siemens**
Digital Industries

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1847
A small garage startup in Berlin, Germany

Employees	Start-up capital	1ˢᵗ year revenue
10	**6.842** thalers	**3,420** thalers

Today
Leading position in Electrification, Automation and Digitalization.

Employees
385,000

Revenue
€87 bn

Net profit
€5.6 bn

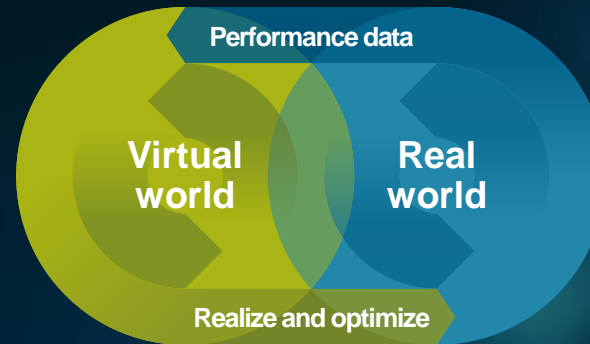Profit margin Ind. Business
10.9%

In fiscal 2019

Digital Industries – Driving the digital transformation of process and discrete industries

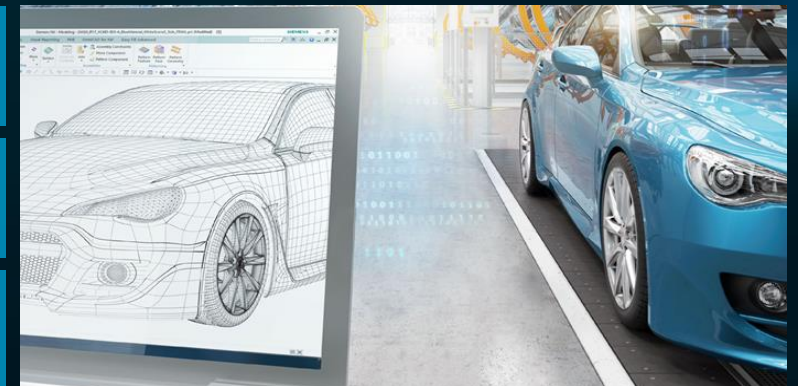## Digital Enterprise

Digital end-to-end solutions for industry

Performance data

Virtual world

Real world

Realize and optimize

MindSphere

Automation and industrial software for process and discrete industries

Industrial communication
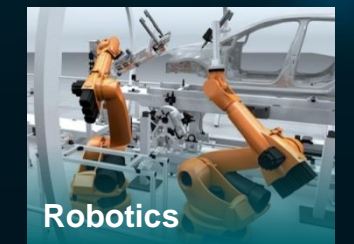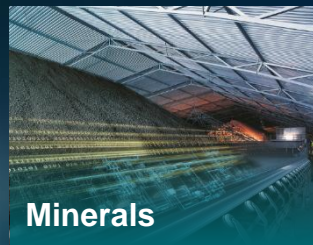
Industrial security

Industrial services

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Driving digital transformation in all industries

Process Industries   **Hybrid Industries**   **Discrete Industries**

Chemicals	Marine	Glass	Food and Beverage	Electronics	Aerospace	Automotive
Water and Wastewater	Minerals	Pharmaceuticals	Batteries	Wind	Machine Building	Intralogistics
Oil and Gas	Power and Utilities	Fiber	Tire	Additive Manufacturing	Cranes	Robotics

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How?

With a holistic digitalization approach

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Digitalization is key to achieving next-level productivity

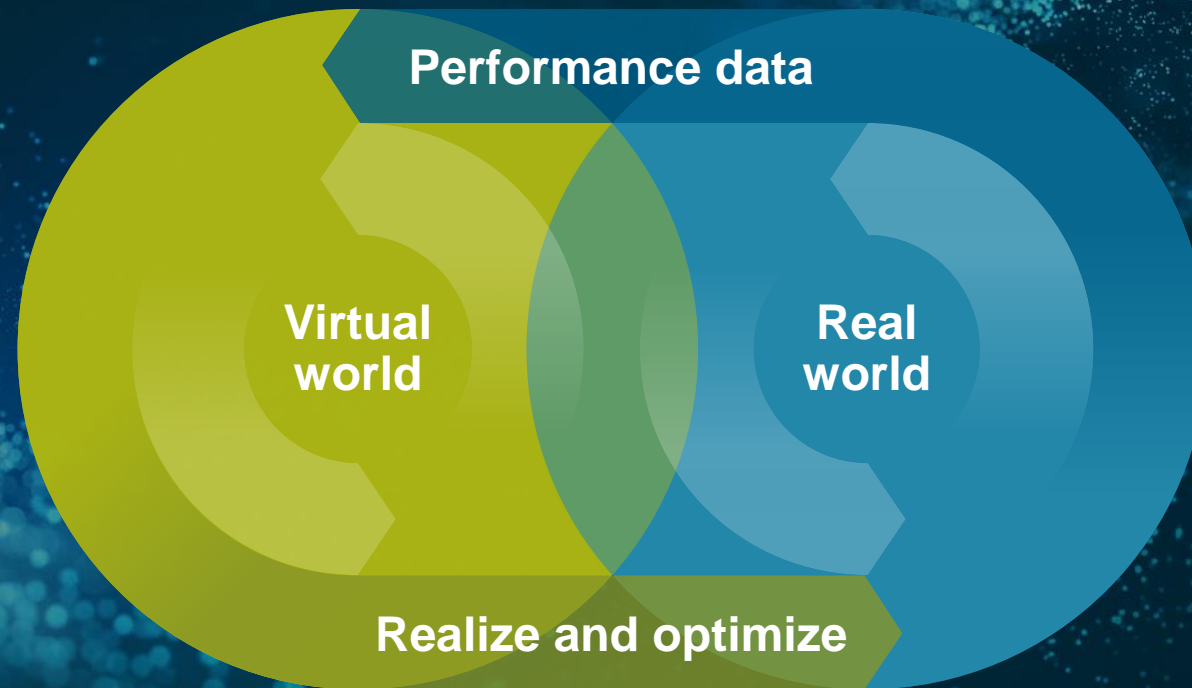**€10 billion investment in acquisitions of software companies**

Virtual world Software

PSe

mx mendix

Mentor Graphics®

PIXEOM Leading Edge Computing

POLARION

Bentley® 1 Advancing Infrastructure

tass International A Siemens Business

Industrial software #1

IBS

LMS®

CD-adapco www.cd-adapco.com

CAMSTAR

VISTAGY

innotec innovation worldwide

UGS The PLM Company

Selection of acquisitions
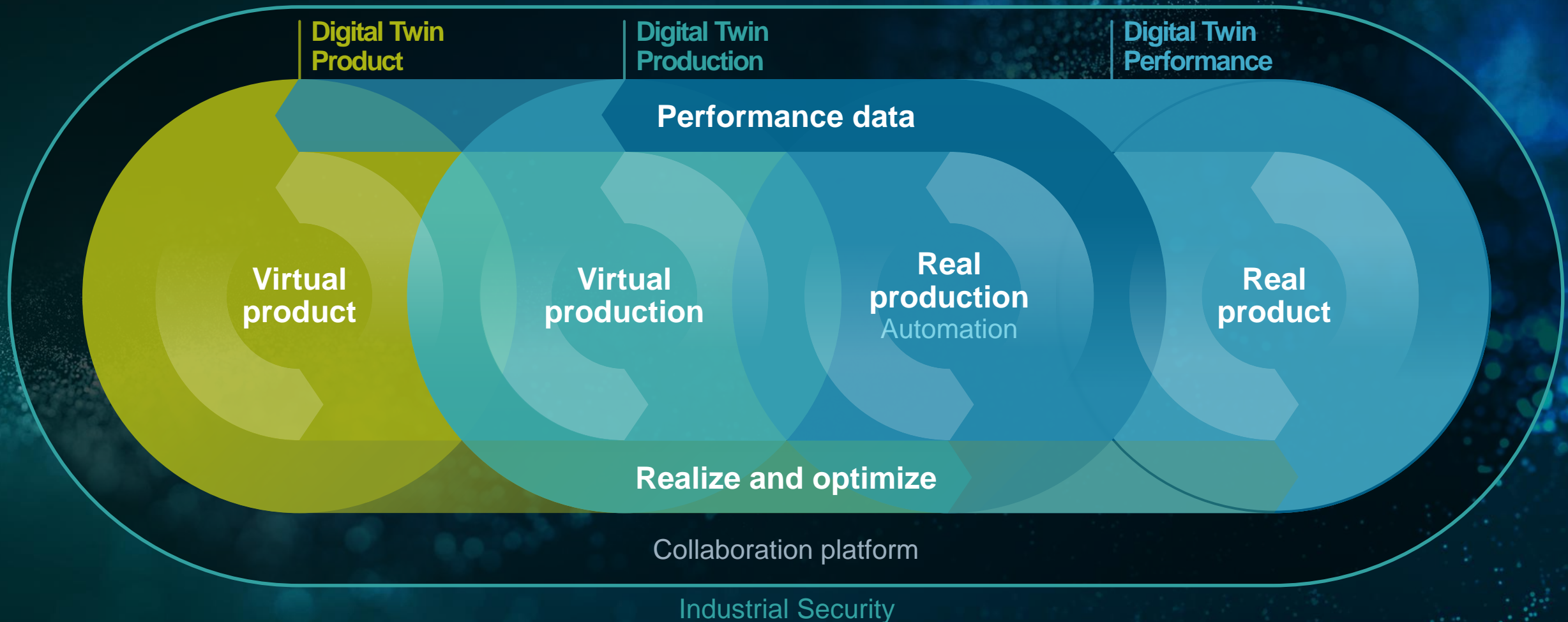
Real world Automation

Automation #1

2007

2019

1 Cooperation

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Merging the virtual and the real world

Performance data

Virtual world

Real world

Realize and optimize

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Continuous optimization
with the most holistic Digital Twin

Digital Twin Product

Digital Twin Production

Digital Twin Performance

Performance data

Virtual product

Virtual production

Real production
Automation

Real product

Realize and optimize

Collaboration platform

Industrial Security

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We help our partners beyond our portfolio to master their digital transformation

Consulting
Accelerating digital transformation from strategy to implementation

Implementation
Implementing Digital Enterprise

Optimization
Continuous improvement by analyzing ongoing operations

Financing
Smart Financing Solutions

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50% less time from testing to paint production

8x faster production process

Reduced batch size from **5,000 l** to **100 l**

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Reduced engineering time by
>1/3

Reduced commissioning by
>50%

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Rotation
as a service

Selling outcome-based
services instead
of ball bearing avoids
downtime

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First state-of-the-art battery plant in Europe:

Truly digital from the design of the cell through production planning and engineering to production and service

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Long-term **digital partnership for co-development** to support the joint customer base in increasing the uptime of pumps and motors and optimizing operation

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GRUNDFOS
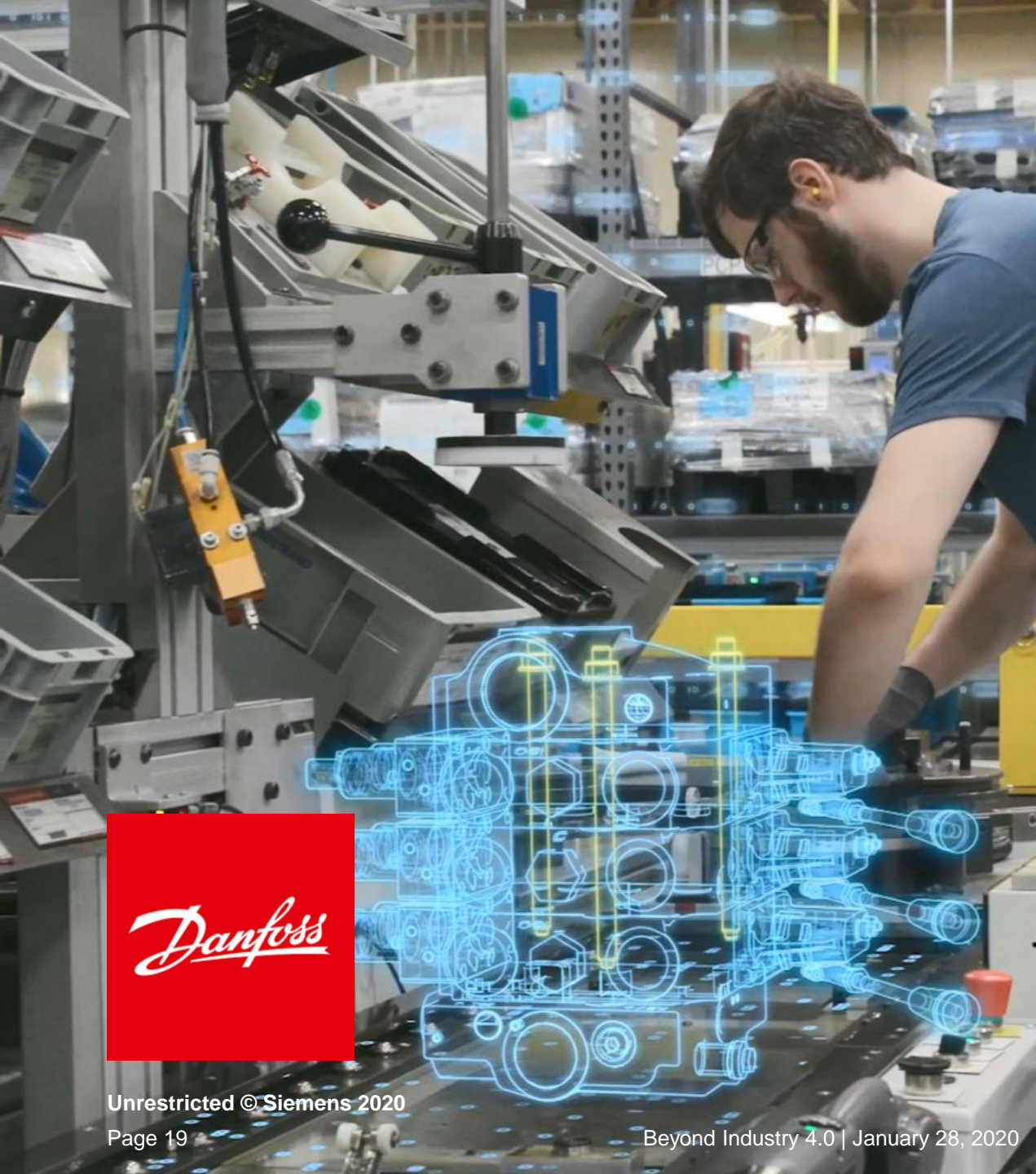
Driving improvements in the assembly cells for cycle times and first pass yield while keeping quality high and reducing costs

" Danfoss can now assure the accuracy of the manufacturing process and possesses the traceability to quickly identify the root cause of any problem."

The future
of manufacturing
will be completely
consumer-centric.

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- individual products
- fast delivery
- best quality
- sustainable products
- healthy products
- traceable origin

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Fast delivery

Systems that make decisions on their own

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Individual products

Produce as flexibly as possible, anywhere, anytime

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calculating
CO2 footprint

CO2 PER MONTH
E NAME

Sustainable products

Knowing the exact CO₂ footprint of anything we build

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Traceable origin

Knowing exactly where every single ingredient comes from

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Cutting-edge technologies enabling autonomous manufacturing

Additive Manufacturing

Artificial Intelligence

Industrial 5G

Cognitive Engineering

Industrial Edge, Industrial IoT

Autonomous Systems

Cloud Technologies

Blockchain-Technology

Augmented and Virtual Reality

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Cutting-edge technologies

Additive Manufacturing and Generatives Design

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

Conventional design
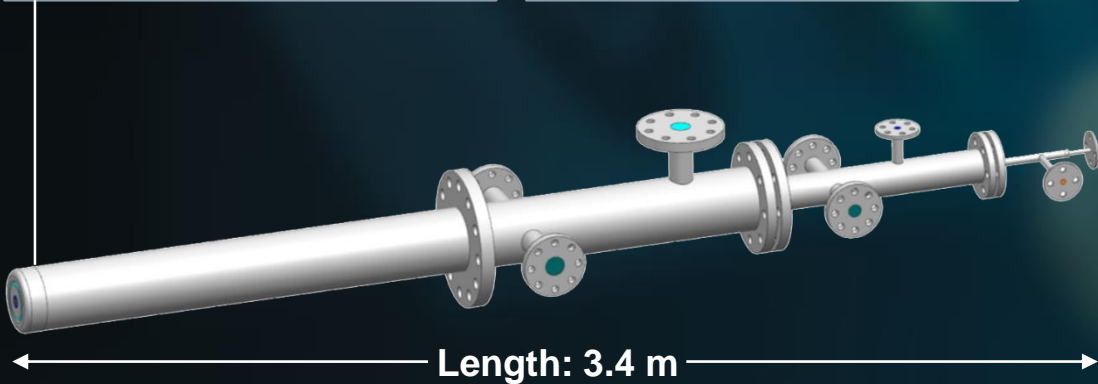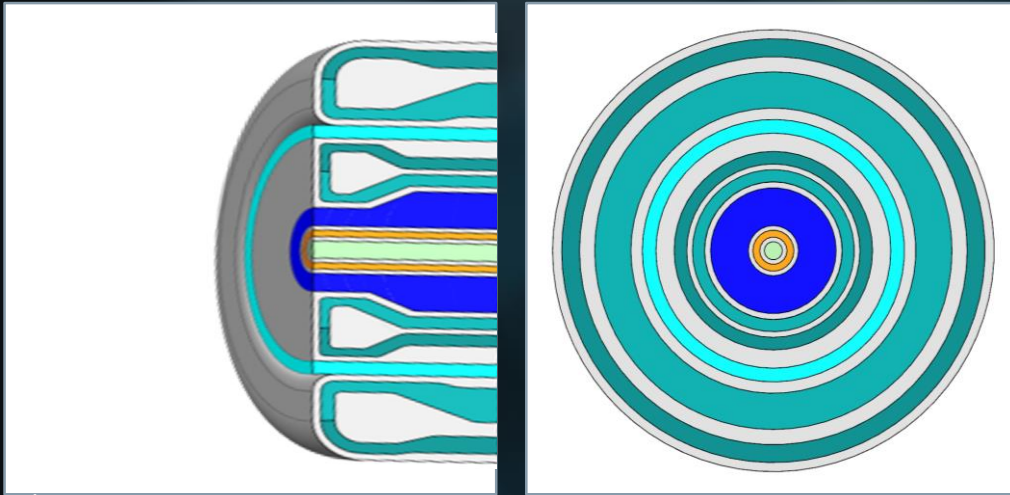
Generative design
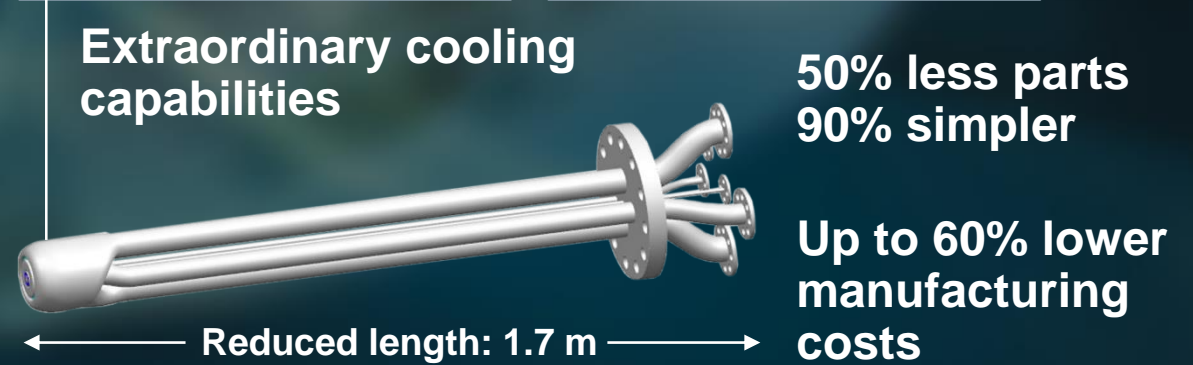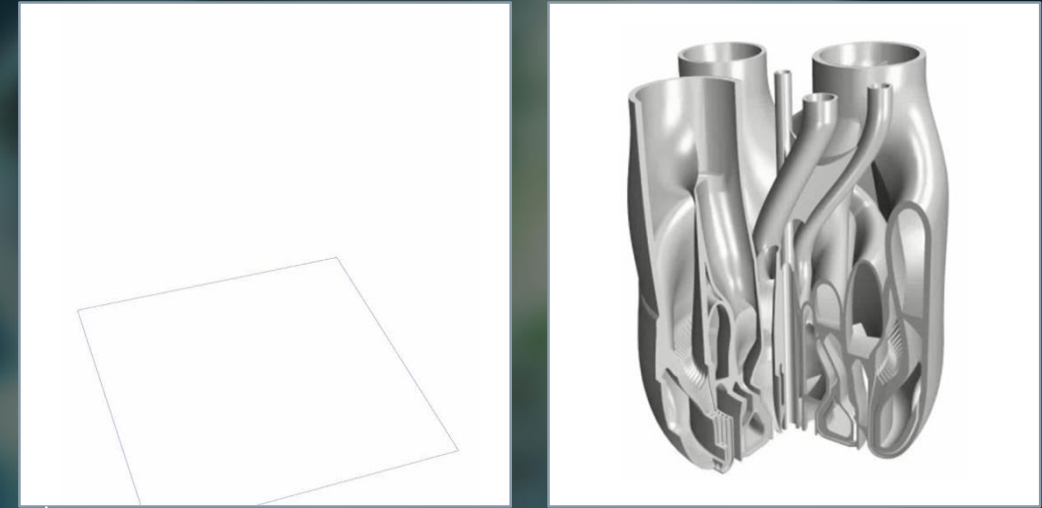
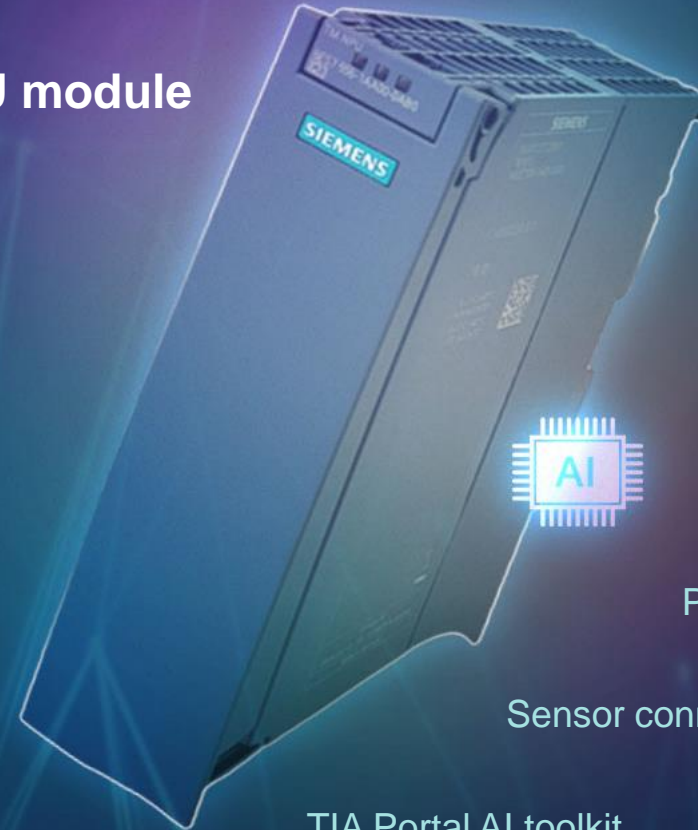**Extraordinary cooling capabilities**

50% less parts
90% simpler

Up to 60% lower manufacturing costs

Length: 3.4 m

Reduced length: 1.7 m

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

Siemens is the first company to enable Artificial Intelligence on the control level.

NPU module

Powerful AI chip

Sensor connection

TIA Portal AI toolkit

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

Cutting-edge technologies

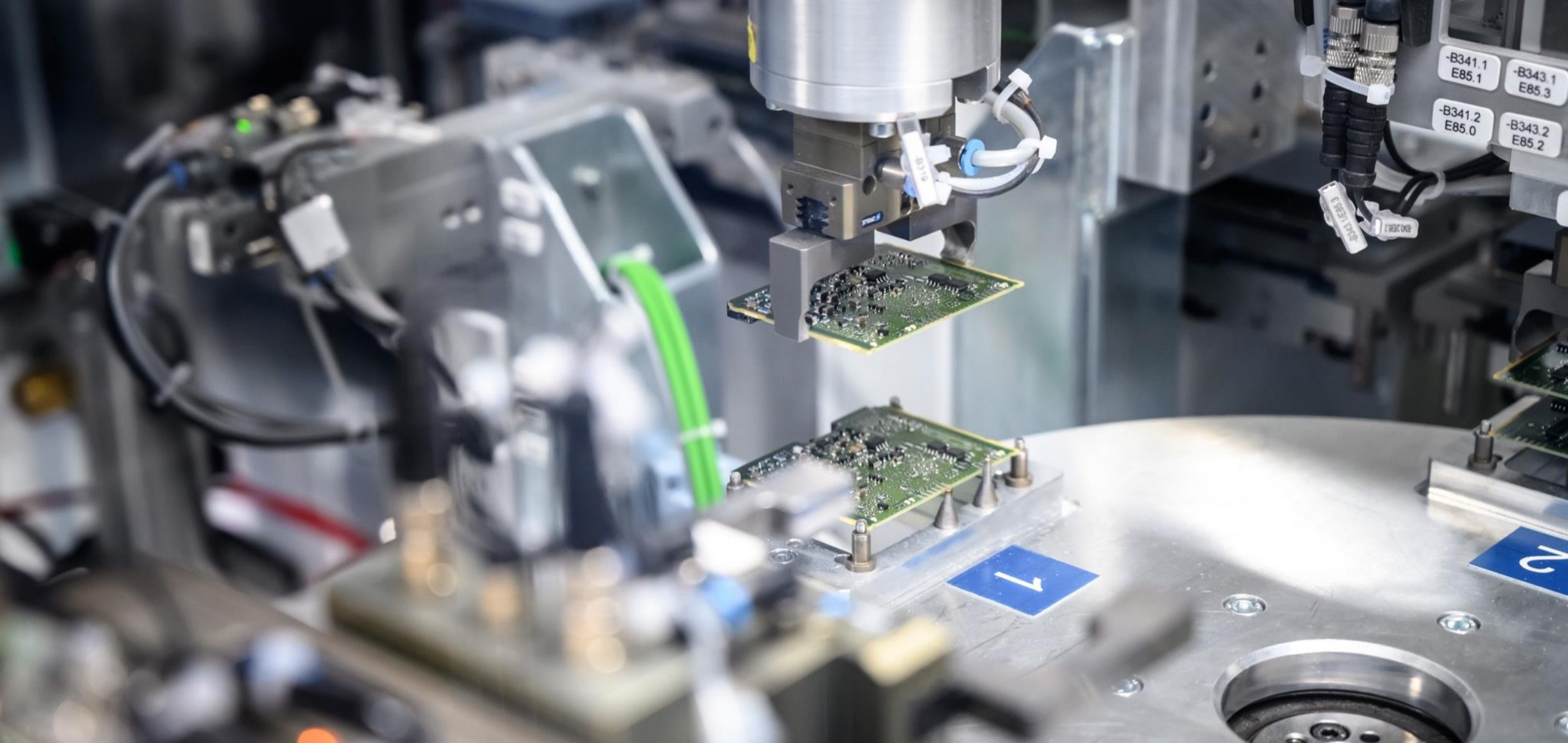# Artificial Intelligence, Industrial Edge and Industrial IoT

X-RAY ON

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

30%
fewer x-ray tests

100%
Quality rate

€500,000
Reduced capital invest

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

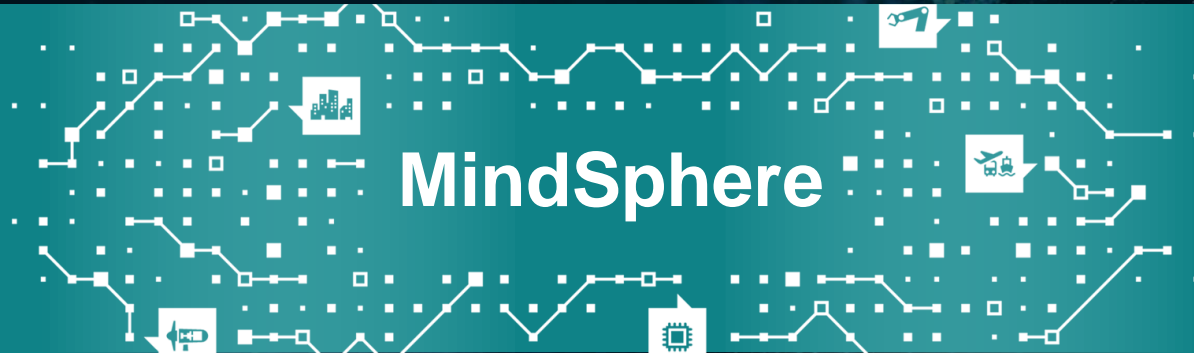# Our IoT operating system MindSphere – enhanced by Edge and Mendix low code app development

Applications
Powerful industry solutions with advanced analytics

mx mendix the app platform

Open PaaS
Develop robust industrial IoT solutions faster with global scalability

MindSphere

Edge Management
Edge Device Management, Edge App Management, and Edge App Store

Edge Apps
Siemens, partner (OEM), and 3rd-party Edge Apps

Edge Devices
Secure, future-proof basis for running Industrial Edge applications

Connectivity
Connect products, plants, systems, machines and enterprise applications
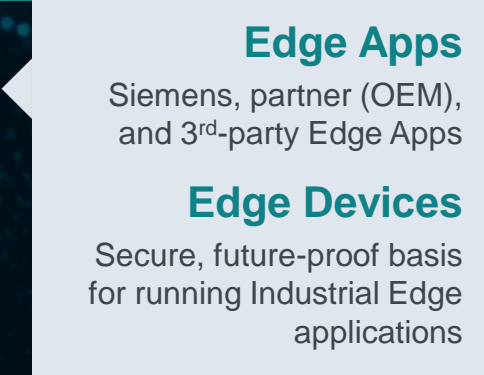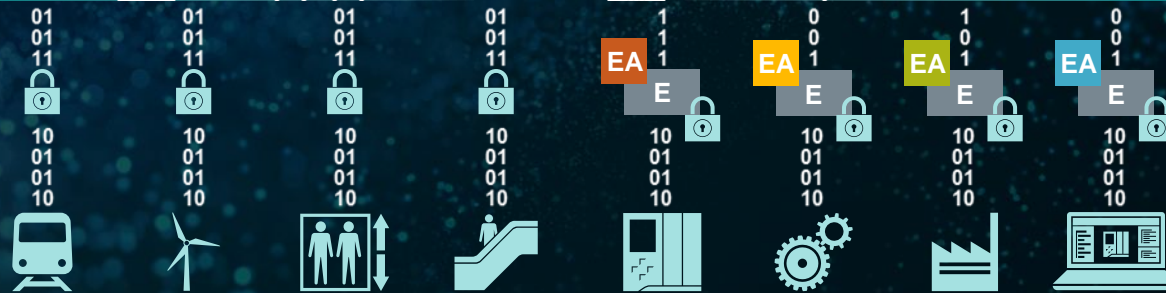
EA E EA E EA E EA E

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

Cutting-edge technologies

Autonomous systems

Additive
Manufacturing

Artificial Intelligence,
Industrial Edge, Industrial IoT

**Autonomous
Systems**

Industrial 5G

Additive
Manufacturing

Artificial Intelligence,
Industrial Edge, Industrial IoT

**Autonomous
Systems**

Industrial 5G

Safety-related and real-time- video support

Cutting-edge technologies

Industrial 5G

Flexible production

Fully automated logistics

Production elements and logistic elements

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

Standalone 5G network in an industrial environment

Proof of Concept (PoC) from Siemens and Qualcomm at the Siemens Automotive Test Center in Nuremberg

Additive Manufacturing

Artificial Intelligence, Industrial Edge, Industrial IoT

Autonomous Systems

Industrial 5G

1,400%
higher productivity

at the digital factory in Amberg since 1990 – with a constant number of employees (1,200)

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Human vs. Machine?

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The digital future

has begun.

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