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Siemens press conference automatica 2018

Munich | June 20, 2018
Digital Enterprise – Implement now!

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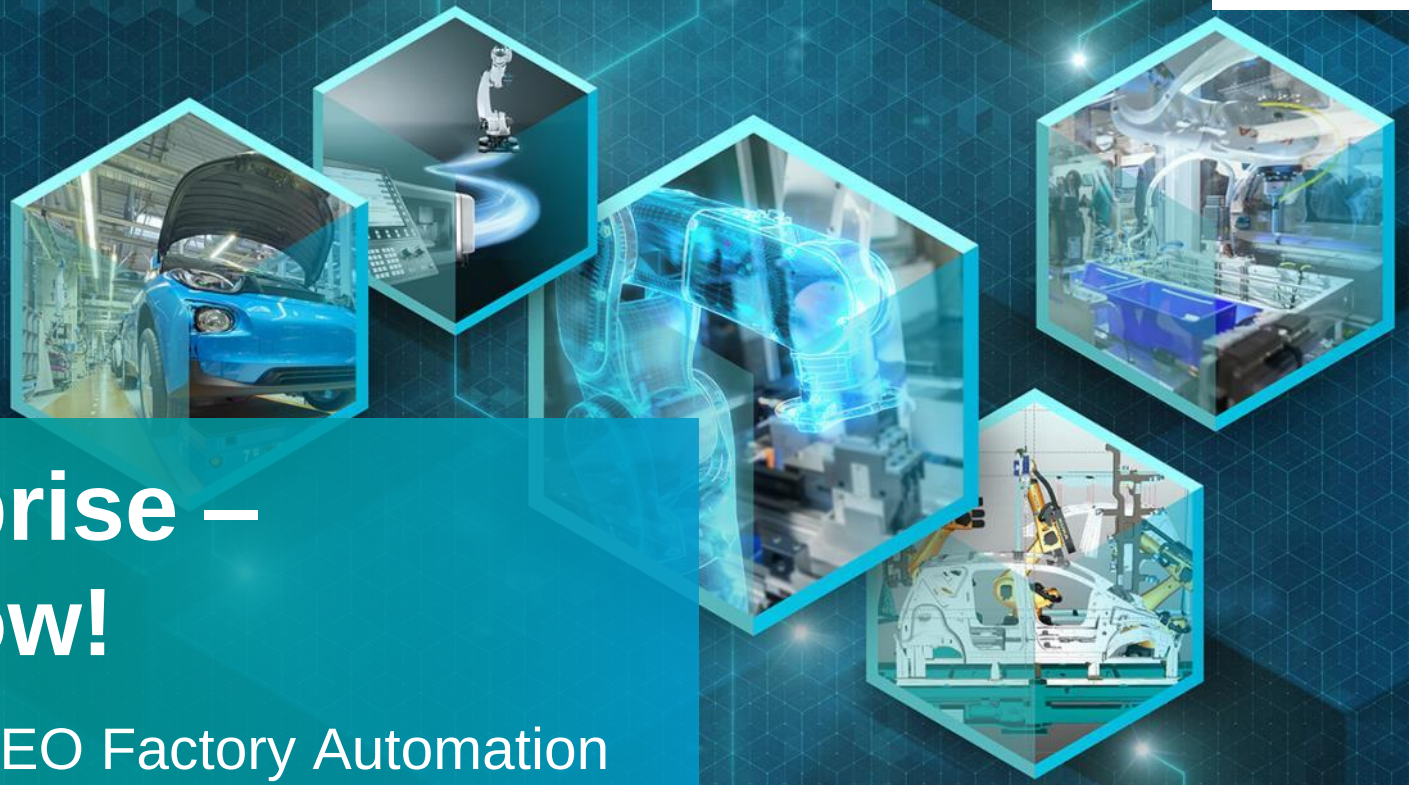

Digital Enterprise – Implement now!

Ralf-Michael Franke | CEO Factory Automation
Dr. Wolfgang Heuring | CEO Motion Control
Armin Grünewald | Business Development PLM

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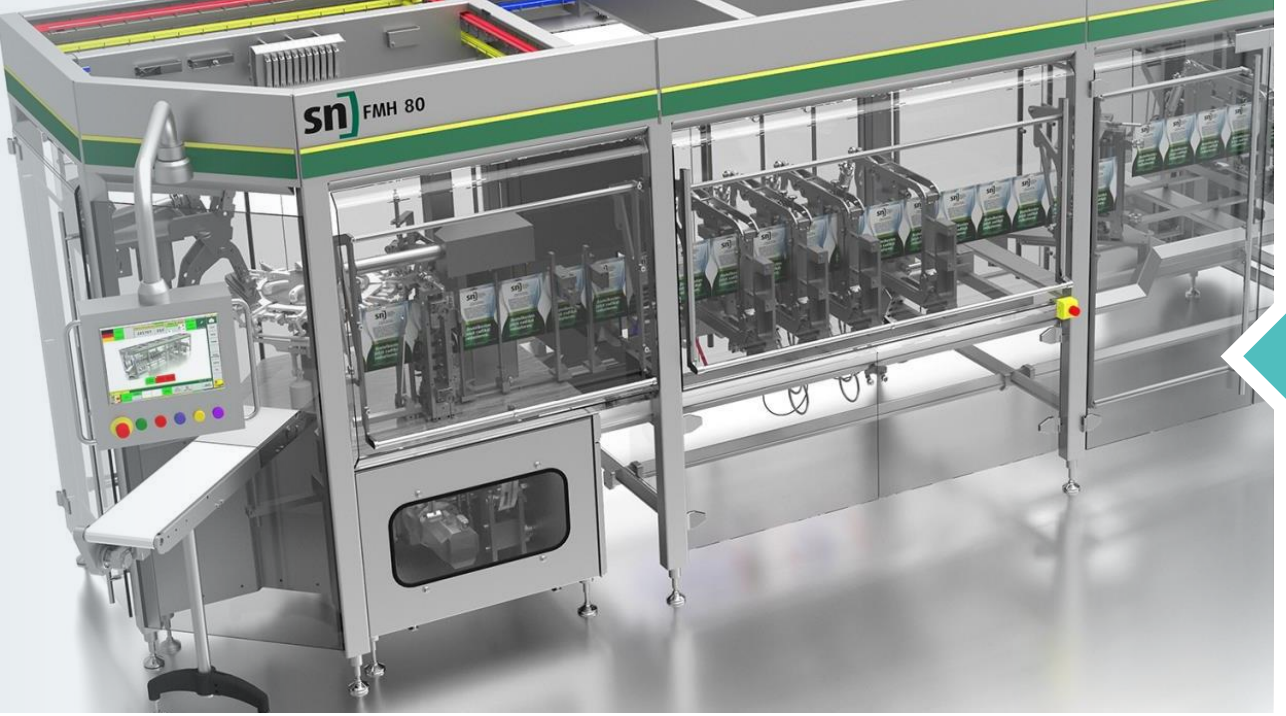
Digitalization opens up new potential!



Machine builder:
30 percent less
engineering time

Machine user:
Down to
lot size one

Integration trend of robots in machine building (VDMA)

Robot and handling integration into control technology

Why at the automatica?

Optimize the production with the Digital Enterprise

Simulation of machines and lines before real commissioning

Manufacturing companies today have to face central challenges

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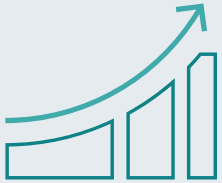
Speed

Flexibility

Quality



Efficiency

New business models

Security

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Siemens holistic approach to integrating, and digitalizing the value chain

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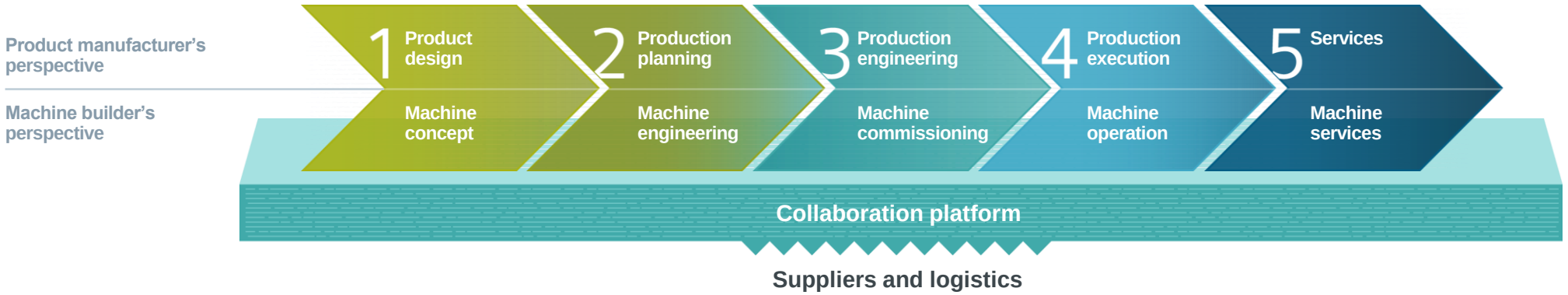

For manufacturer and machine builder

It doesn't matter where you start

Brownfield or greenfield

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Generate a powerful Digital Twin of the entire value chain

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Predict product and production performance

Reduce the number of physical prototypes

Ensure you've met customer requirements

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How?

Digital Twin of the Product

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

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Digital Twin of the Product
Integrated CAD/CAE/CAM solution

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Perfect your product in the virtual world

Design, simulate and validate your product in a virtual environment

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Digital Twin of the Production

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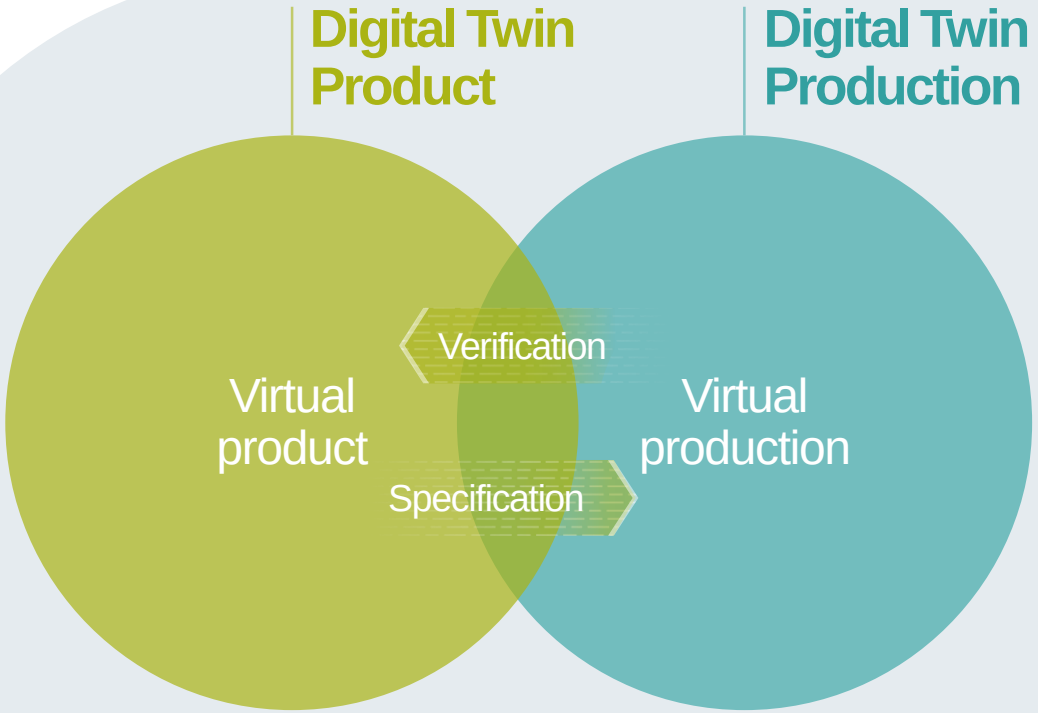

Plan, simulate, predict and optimize production digitally with PLC code generation and virtual commissioning.

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Digital Twin of the Production
Assembly Planning

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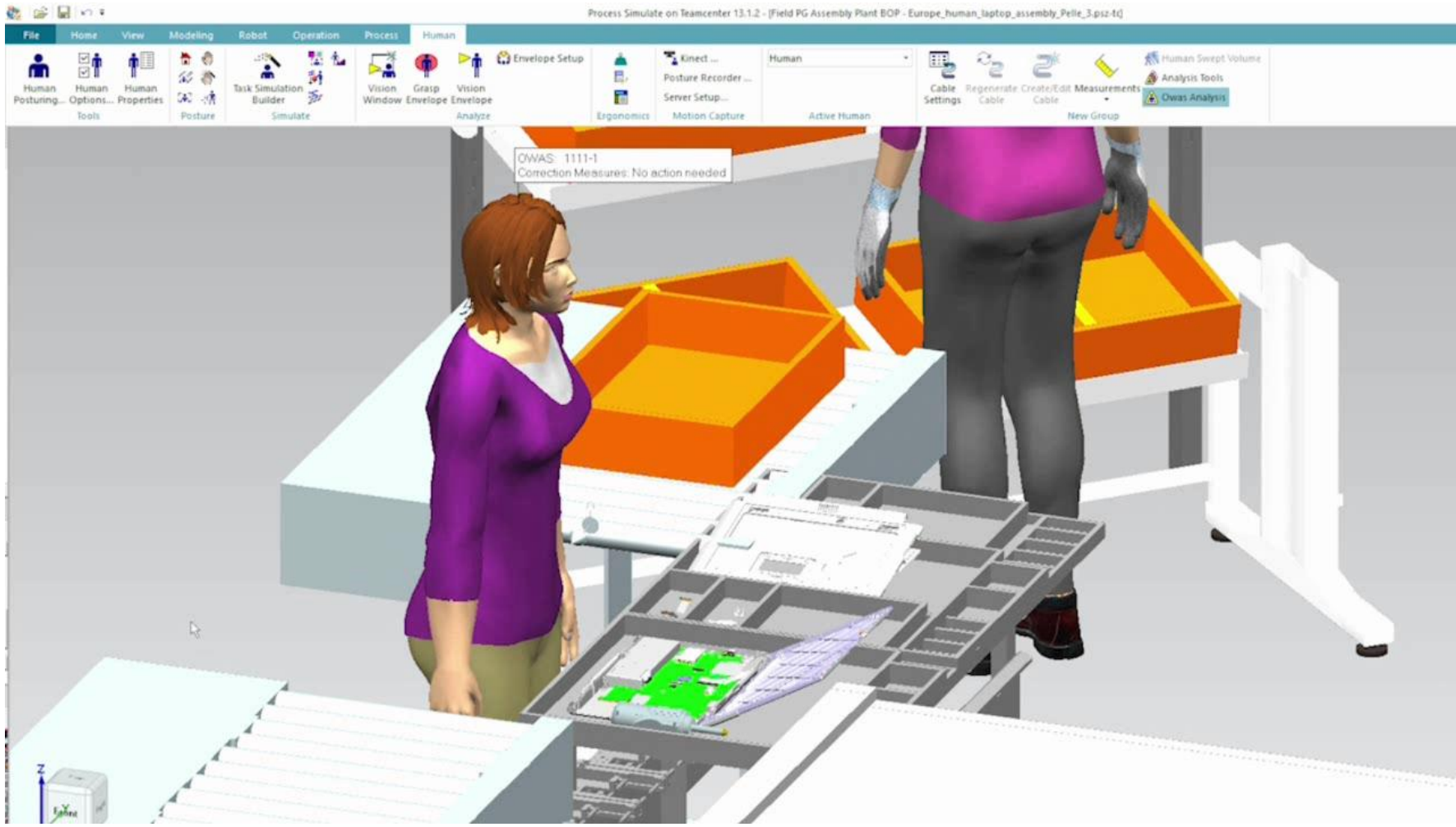
Simulate working conditions for humans

Tecnomatix Process Simulate



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Digital Twin of the Production
Assembly Planning

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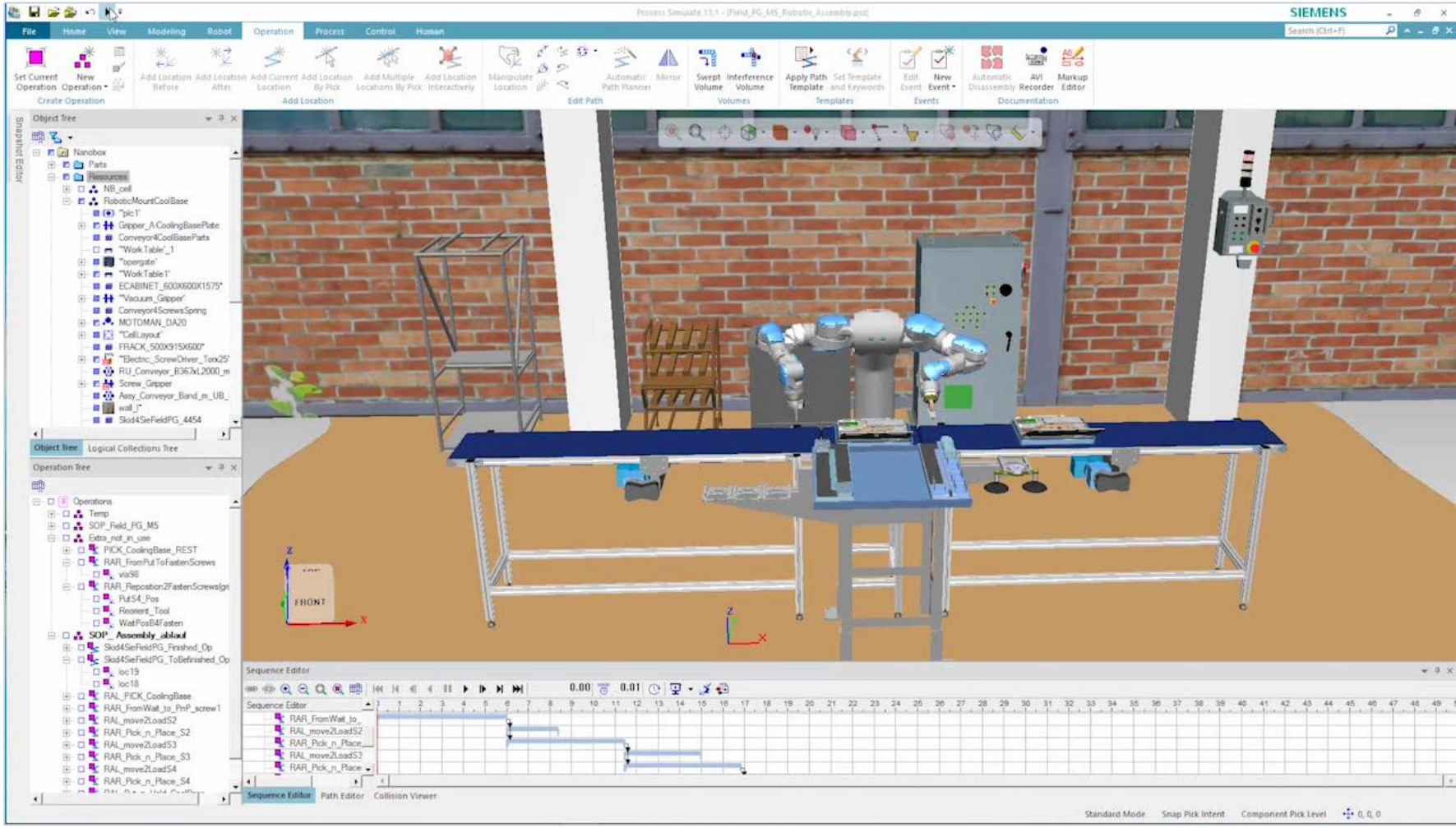
Simulate work processes for robots

Tecnomatix
Process Simulate



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Innovation
Merging the virtual with the real world

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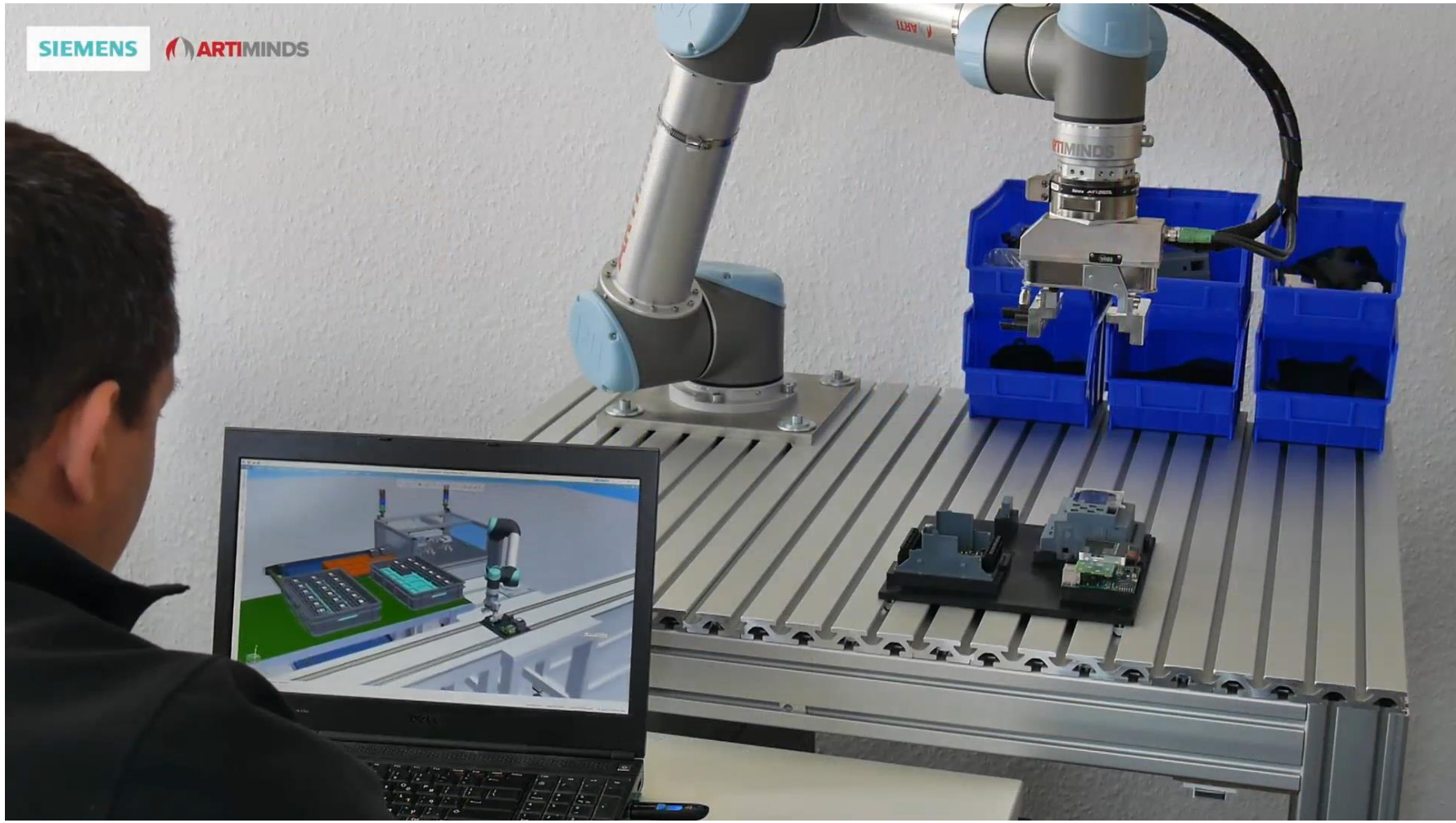
Smart Assembly Robotics

Force sensing/ vision robotics

Task-based programming

Smooth transition from manual to robotic

End to end solution



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Digital Twin of the Production
Part Manufacturing Planning

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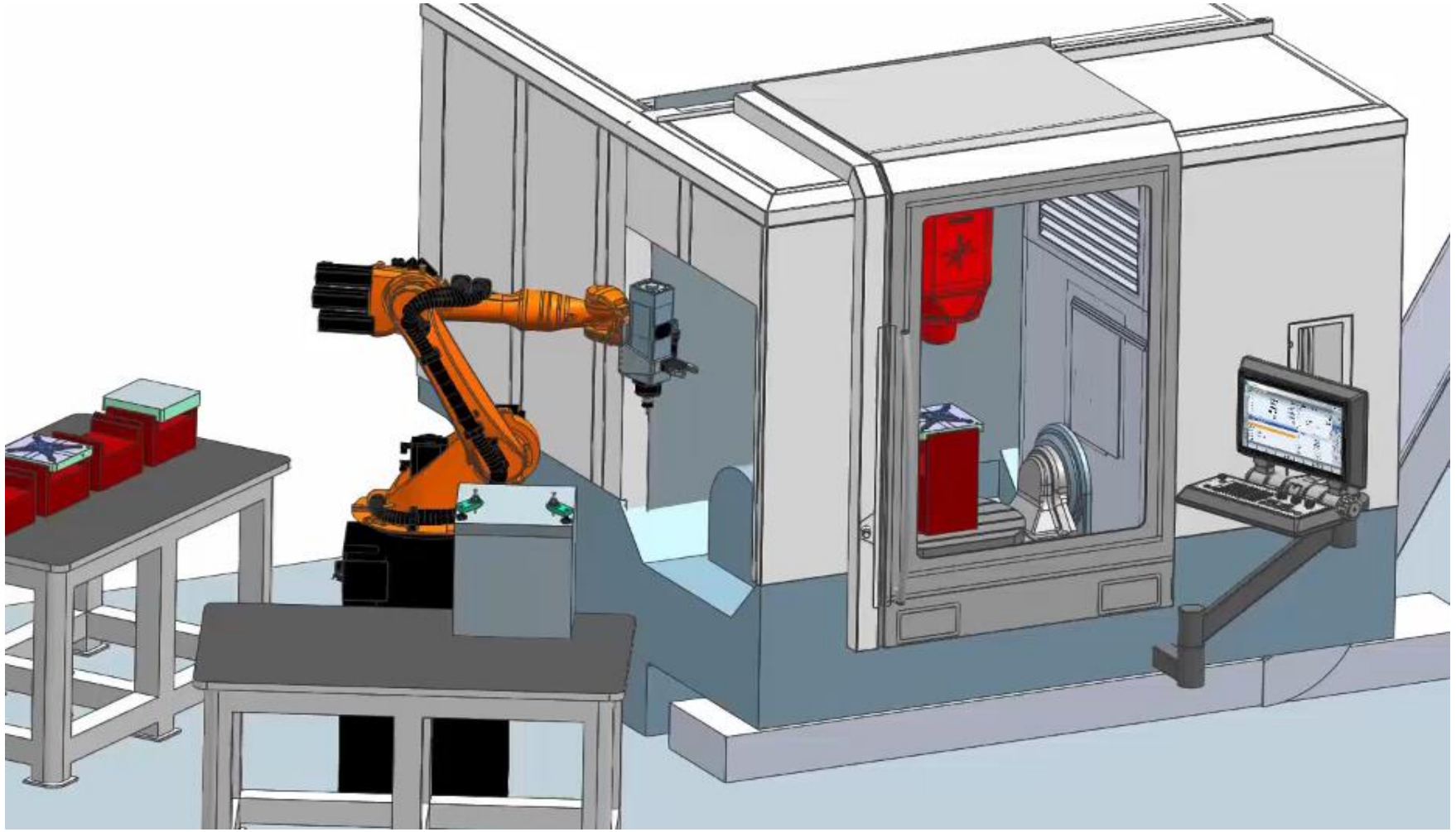
Robot and handling integration into control technology

NX CAD/CAM/CMM
TC Manufacturing



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Digital Twin Production

Siemens and Stratasys collaboration

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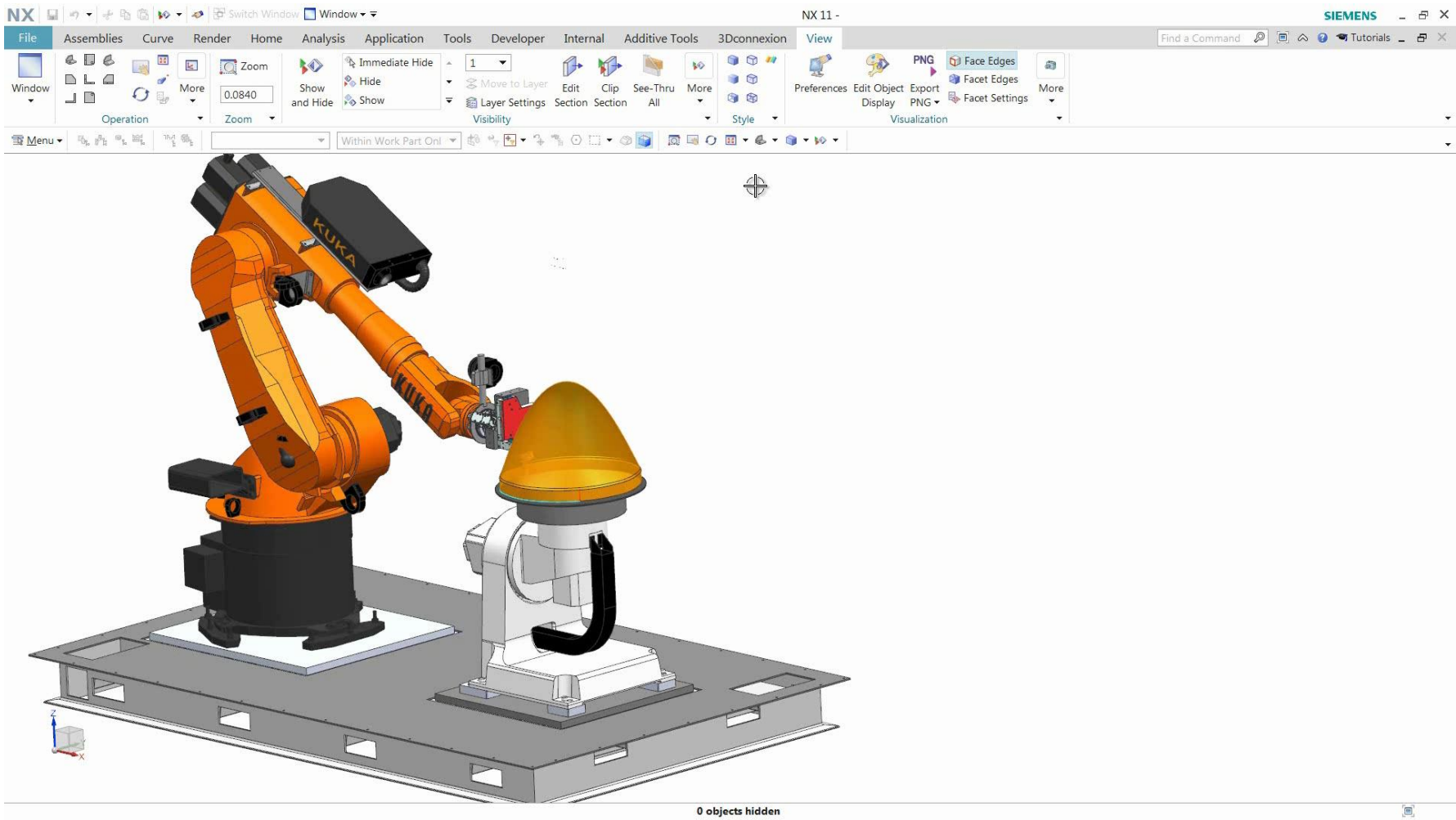
Simulate revolutionary designs with Additive Manufacturing

NX CAM Robotics and Multi-axis deposition



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Digital Twin of the Production
Factory Simulation

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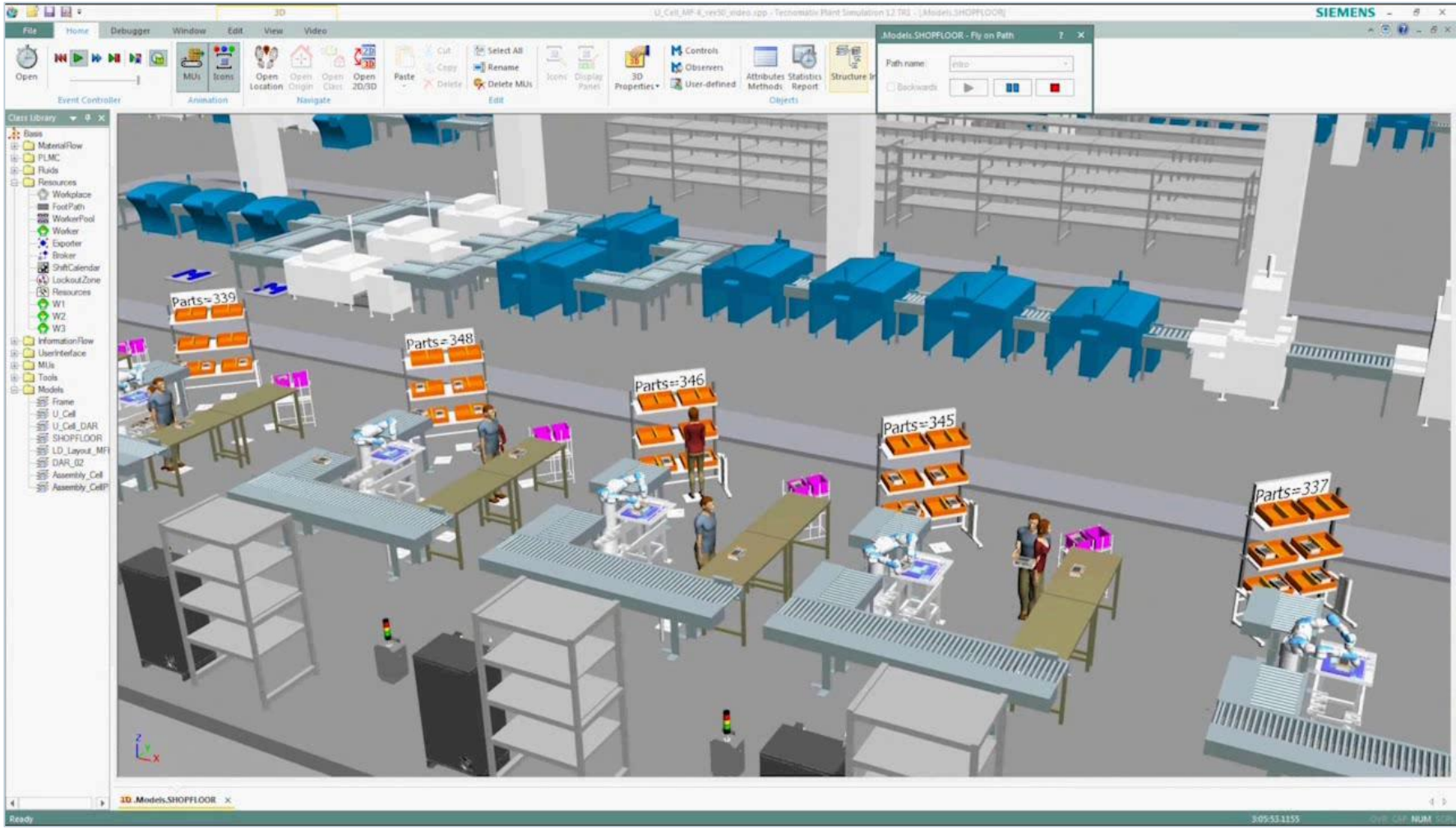
Simulate and optimize your production processes

Tecnomatix
Plant Simulation



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Digital Twin of the Performance
Factory Simulation

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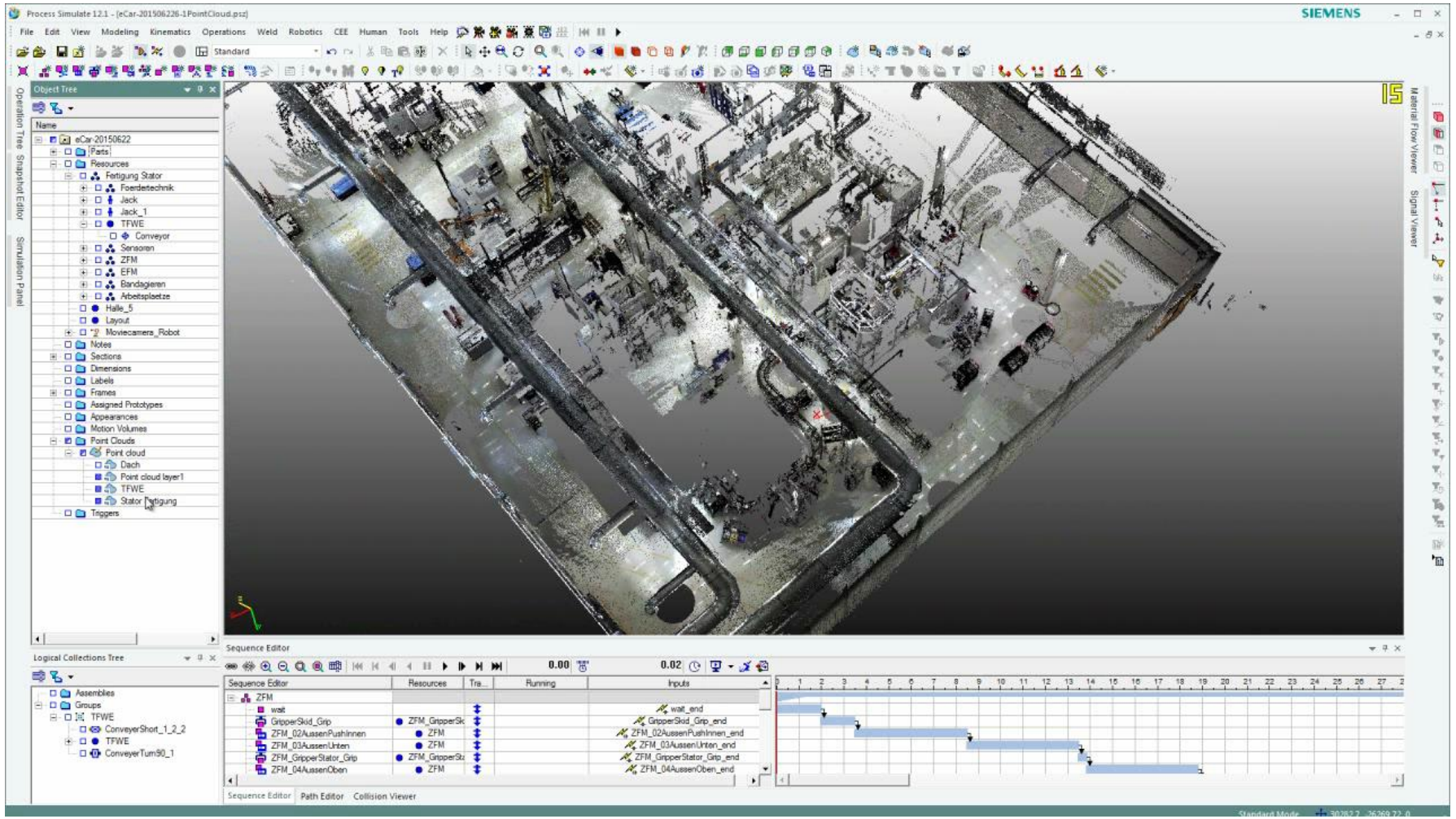
Simulate and optimize your production processes

Tecnomatix
Plant Simulation



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The most holistic Digital Twin

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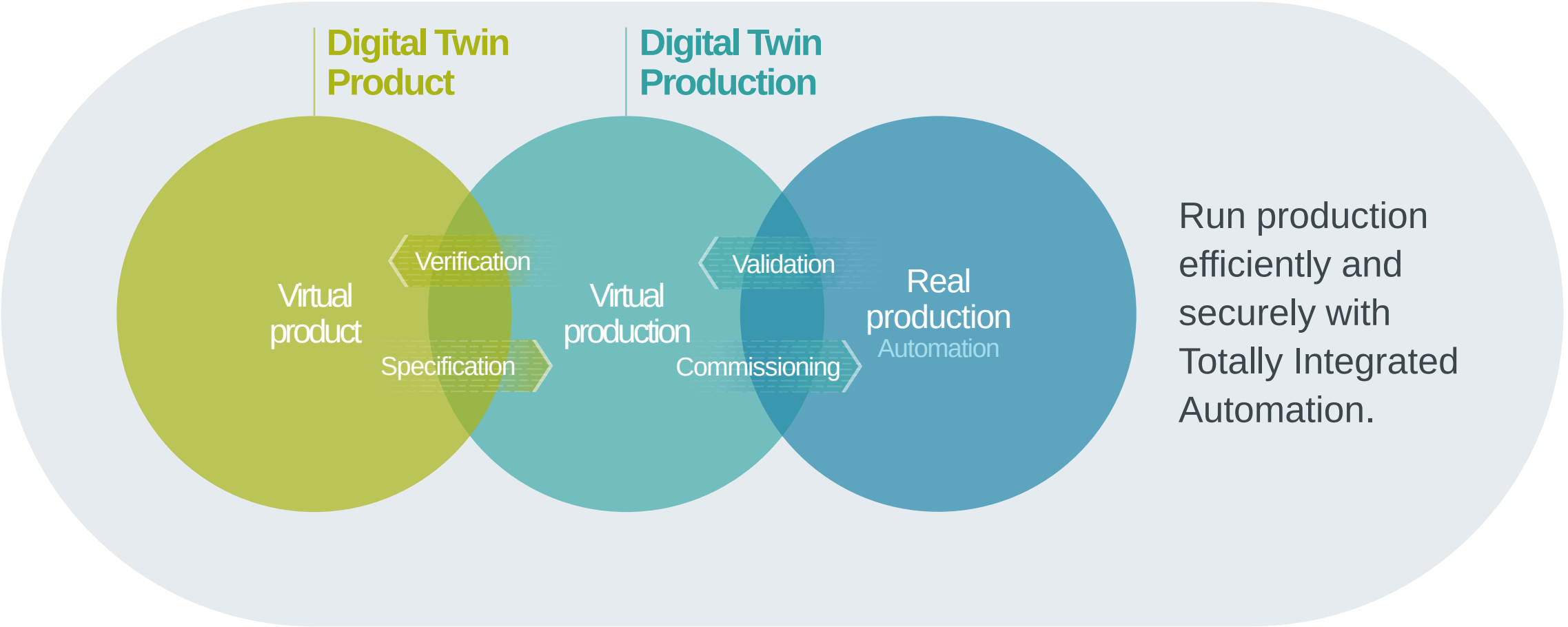

Run production efficiently and securely with Totally Integrated Automation.

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Digital Twin Real production

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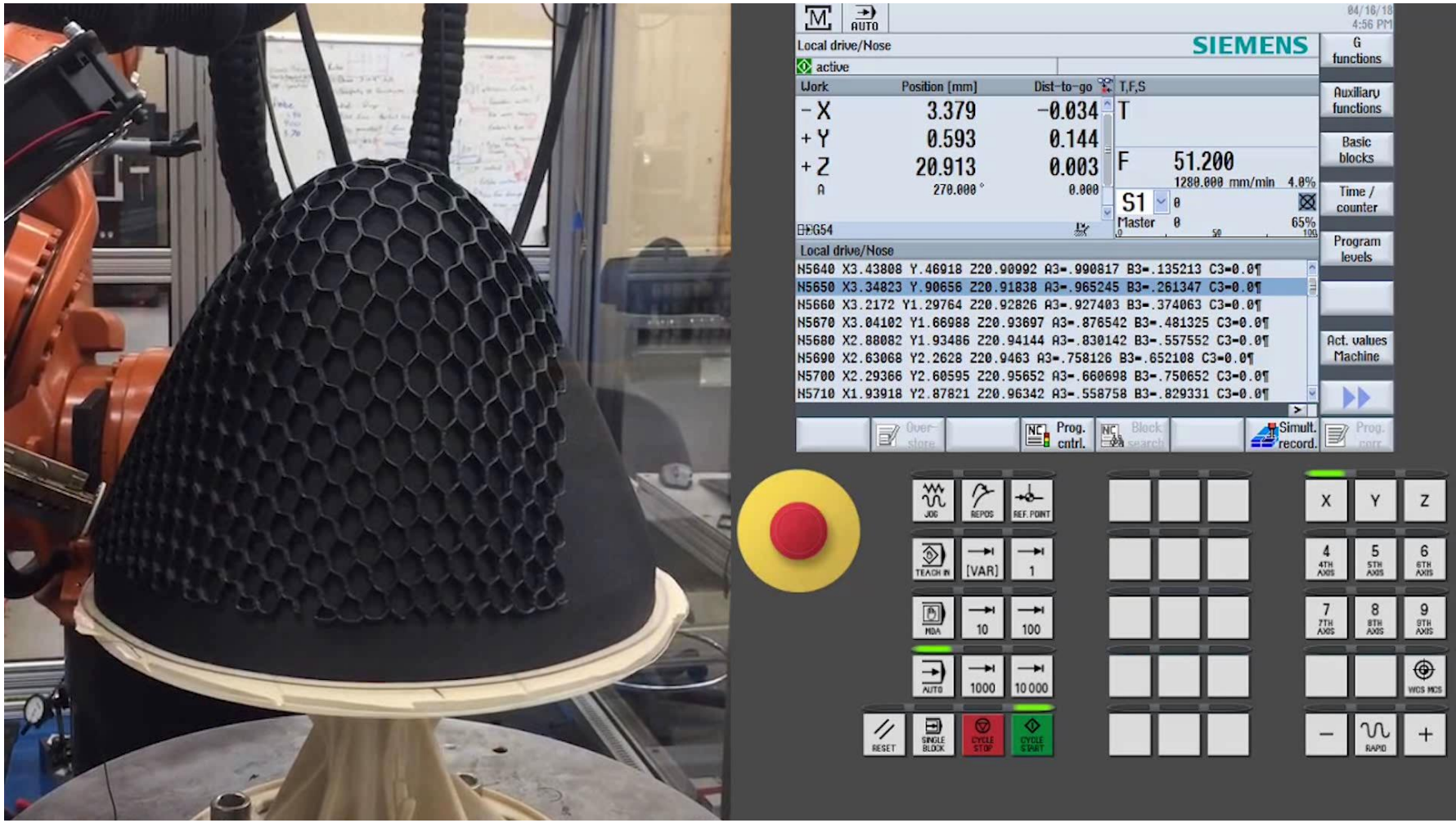
Realize revolutionary designs with Additive Manufacturing

Robot control with SINUMERIK and SIMATIC



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Digital Twin Performance

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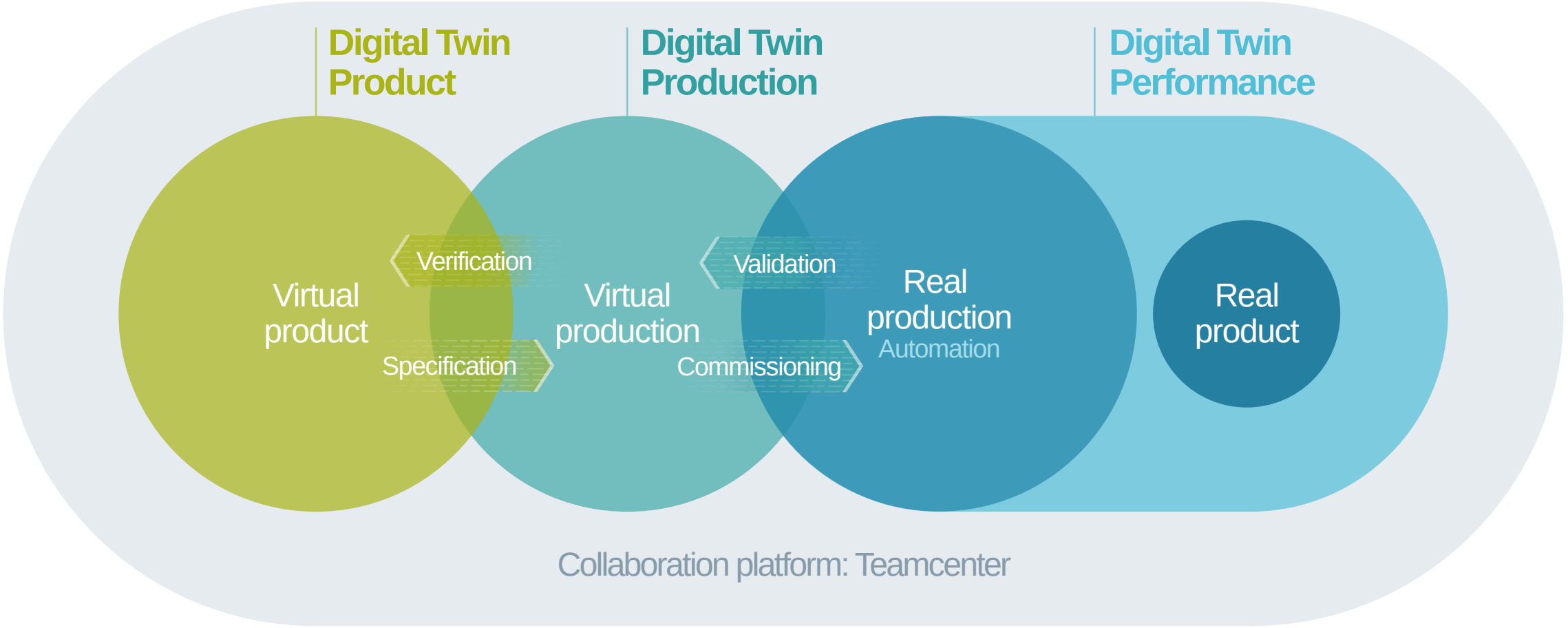

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Digital Twin Performance

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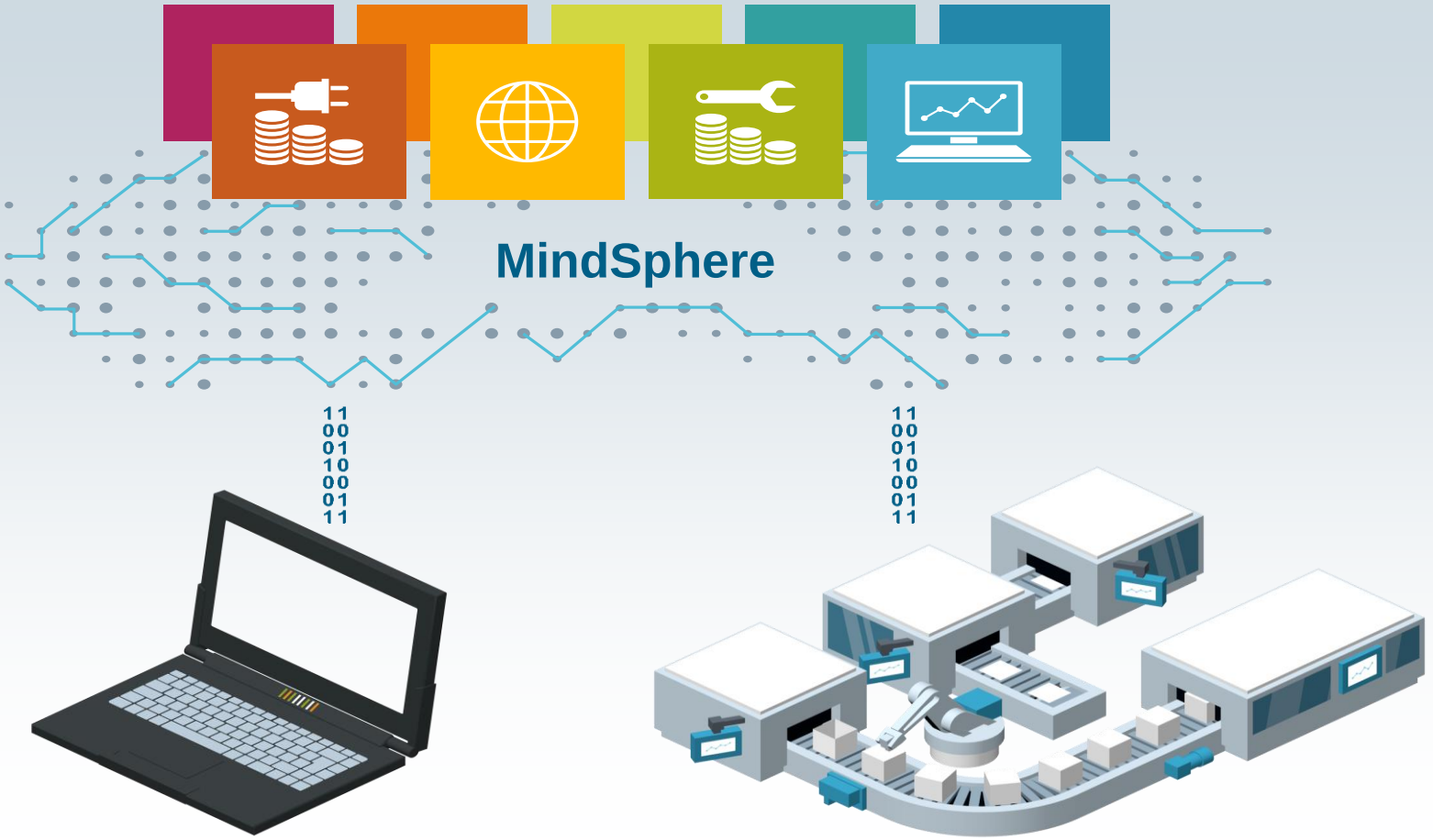
Analyze and evaluate product and production performance

**MindSphere –
the cloud-based, open
IoT operating system**



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Continuously improve product and production in the real world

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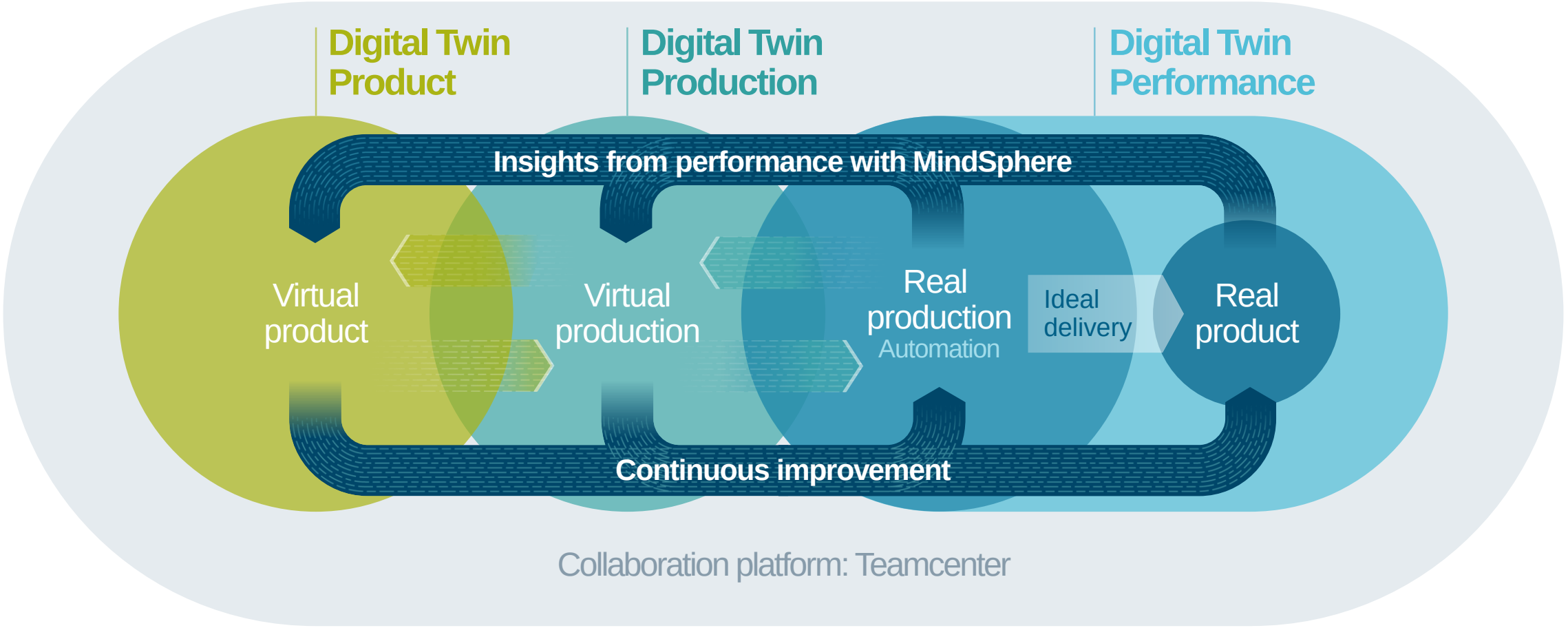

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Robot integration

Use of robots –
Manufacturing companies facing significant challenges

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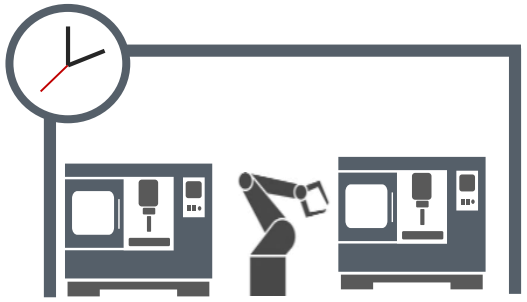
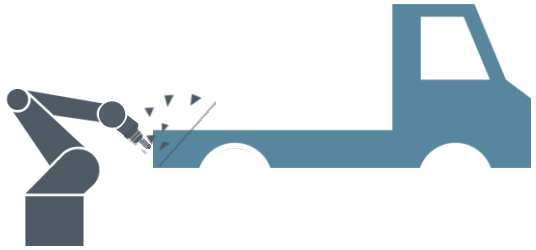
More automation



Robots are increasingly replacing simple repetitive manual tasks

More flexibility



A robot's six degrees of freedom make it flexible for different applications

New machine concepts

The tight integration of the robot in or next to the machine allows the development of innovative machine concepts

Siemens offers multiple solutions
from entry level to a complete robot integration

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Scalable Siemens portfolio – Integration of robots into machine automation

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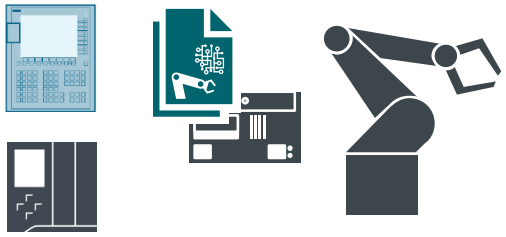
Usability

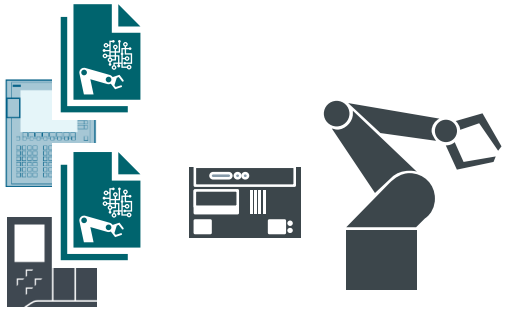
Signal coupling

- Separate controller, separate engineering tool
- Communication via I/O interface
- Separate HMI device



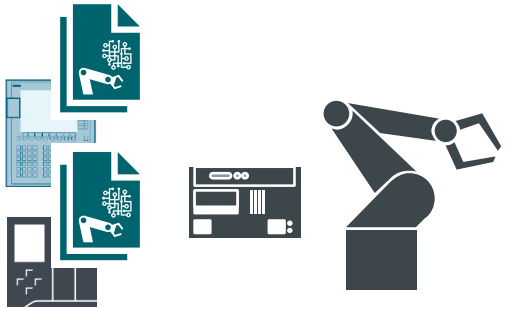
Program integration

- Commands via Siemens controller
- Complete programming of Siemens engineering tool
- Single point of operation: Siemens HMI



Complete integration

- Single controller concept for automation
- Complete integration of kinematics
- Path control
- Digital twin available



Integration into Siemens portfolio

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Scalable Siemens portfolio for machine tool applications – Robot integration with SINUMERIK Run MyRobot

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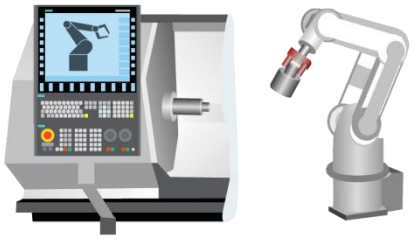
Usability

Signal coupling

Run MyRobot/EasyConnect
increases the degree of automation by reducing manual tasks

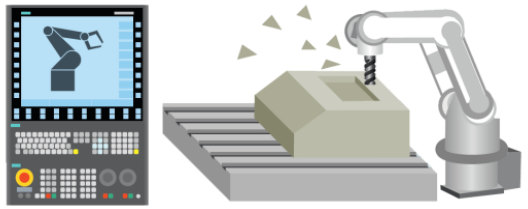
Program integration

Run MyRobot/Handling and /Machining
enables flexibility in production without requiring comprehensive robot expertise



Complete integration

Run MyRobot/DirectControl
for new machine concepts and manufacturing processes



Complexity of integration

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Machining and handling of motors

Practical application in the Siemens electric motor production

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Flexibility in the manufacture of low-voltage motors through the use of soft- and hardware from Siemens

- Manufacturing planning and simulation of the assembly line and the robot cell with NX and Plant Simulation
- Handling and machining tasks (drilling and friction process) with SINUMERIK Run MyRobot

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Highly flexible robotic application in the Aerospace industry

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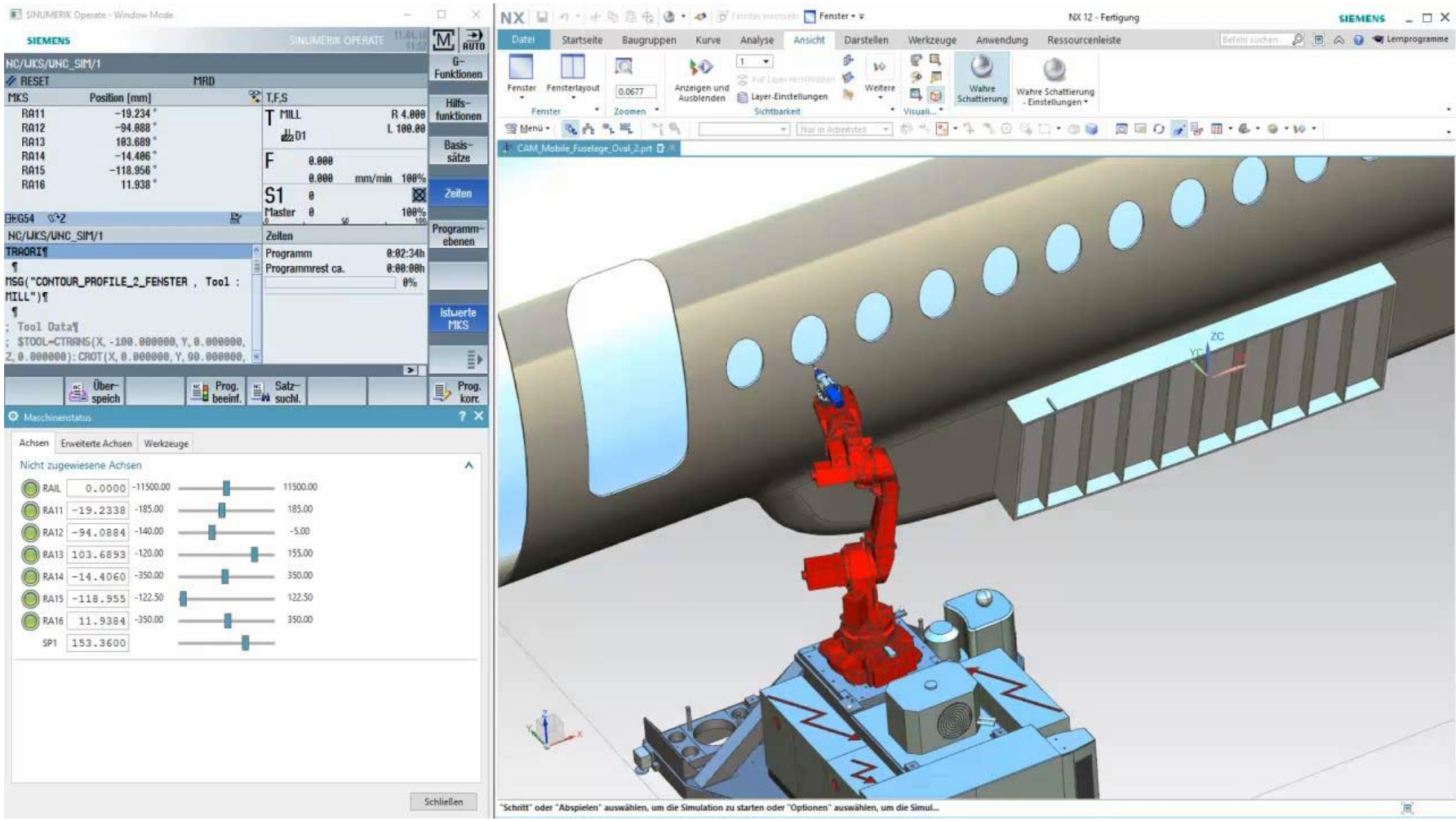
Mobile machining of aircraft components with utmost precision

- Shorter development and production times by full integration of the CNC into the simulation (VNCK)
- Flexible, fully automated manufacturing concepts with highest level of quality and accuracy
- Thanks to the complete TIA portfolio with SIMATIC, SINUMERIK, SINAMICS, SIMOTICS



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High-precision CNC robotics in additive and cutting application

Ultimate flexibility through material extrusion combined with milling

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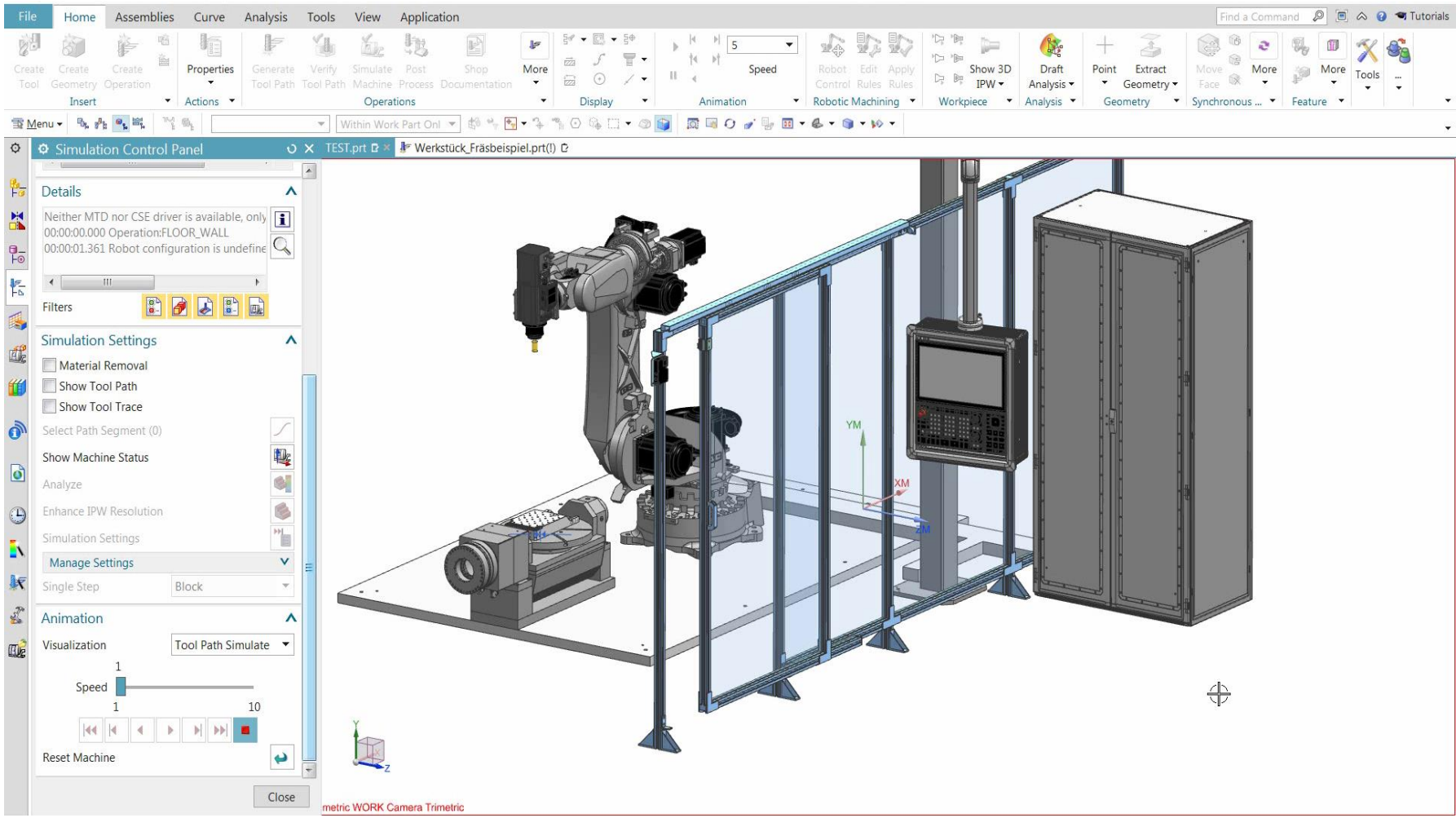
Exploring upcoming manufacturing technologies like additive manufacturing with robotics

- Connecting the virtual and real worlds with the Digital Twins
- SINUMERIK CNC controlled Comau robot with printing and milling head shows hybrid application



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Virtual Commissioning

Highlight Showcase – Digital twins shorten time-to-market

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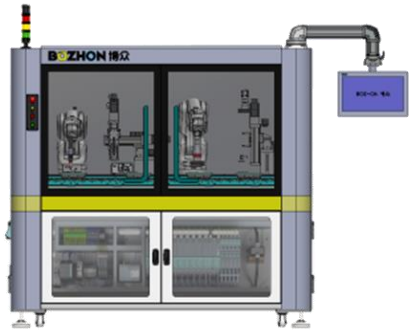
Machine Design



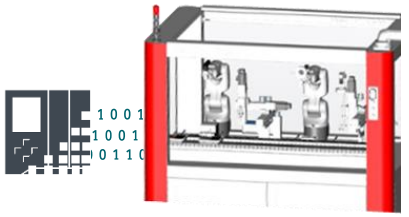
Machine Assembly

Engineering and Virtual Commissioning

NX MCD

TIA PORTAL

TIA Portal



PLCSIM Advanced and NX MCD

Real Commissioning

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automatica 2018 –
Electronics Assembly Machine – Highlights

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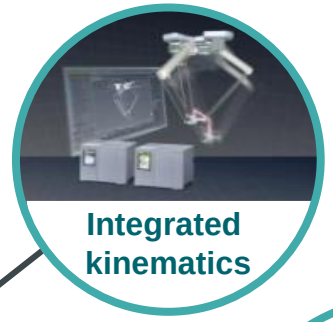

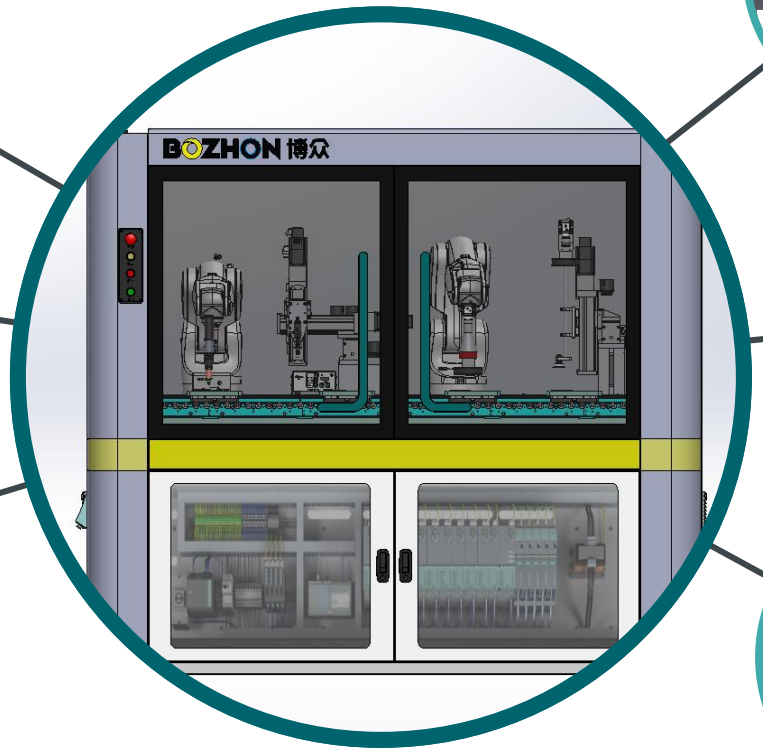

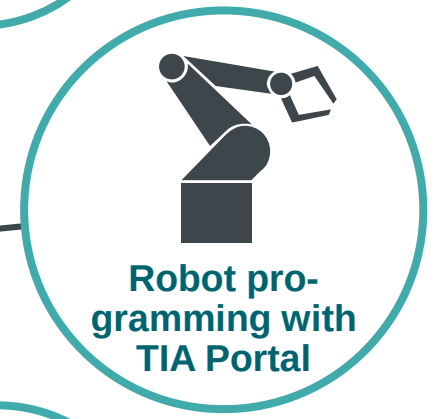

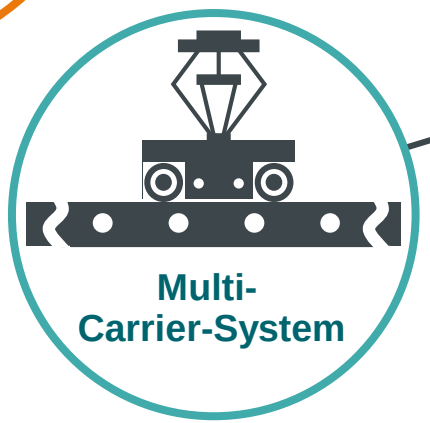

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TIA Portal Robotics Library (PLCopen compliant) – Unified robot interface with flexible robot selection

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Today

Robotics Library 1

Interface 1

Vendor 1

Robotics Library 2

Interface 2

Vendor 2

Robotics Library 3

Interface 3

Vendor 3

Tomorrow

SIEMENS Robotics Library

Unified interface

Vendor 1

Vendor 2

Vendor 3

...

Vendor n

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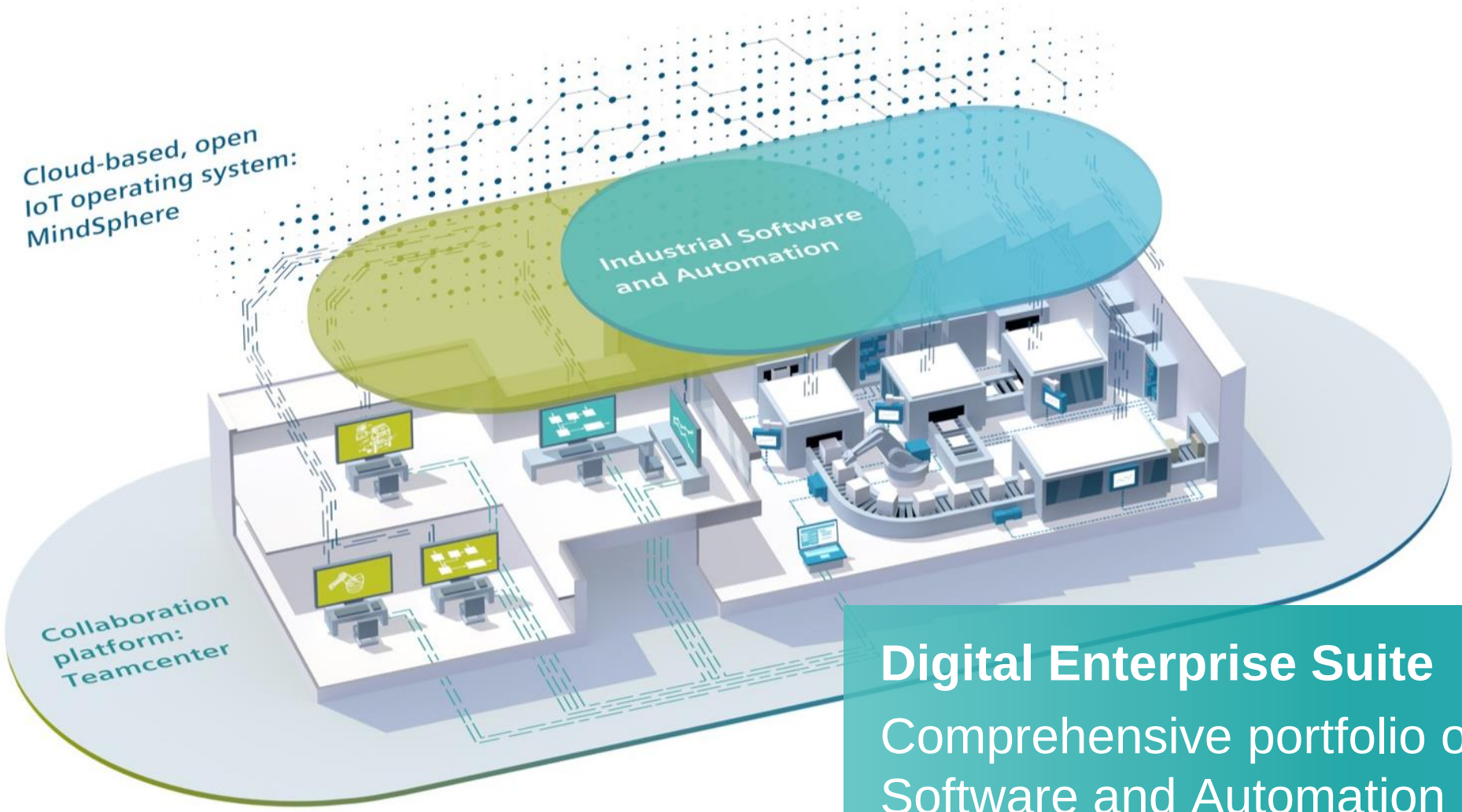

Digital Enterprise Suite

Comprehensive portfolio of Industrial Software and Automation inclusive seamless robot integration.

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The member companies of MindSphere | World support the worldwide application and positioning of MindSphere

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Shared activities of the organization

- Recommendations for requirements imposed on IoT operating system MindSphere
- International rollout of activities (next step Italy, ...)
- Expansion of member companies and user groups (16 further requests approved)
- Support in opening up new digital markets for new data-based business models

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Digital Enterprise – Implement now!

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Q&A

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