

The background of the slide is a blurred photograph of a busy trade show or exhibition hall. In the foreground, a large digital display shows a complex industrial interface with various data points, charts, and text prompts. To the left, a person is partially visible, looking at the display. The Siemens logo is positioned in the top left corner.

SIEMENS

Klaus Helmrich | Member of the Managing Board of Siemens AG

On the Way to Industrie 4.0 – The Digital Enterprise

Siemens focuses on electrification, automation and digitalization – and is actively picking up on new technological developments

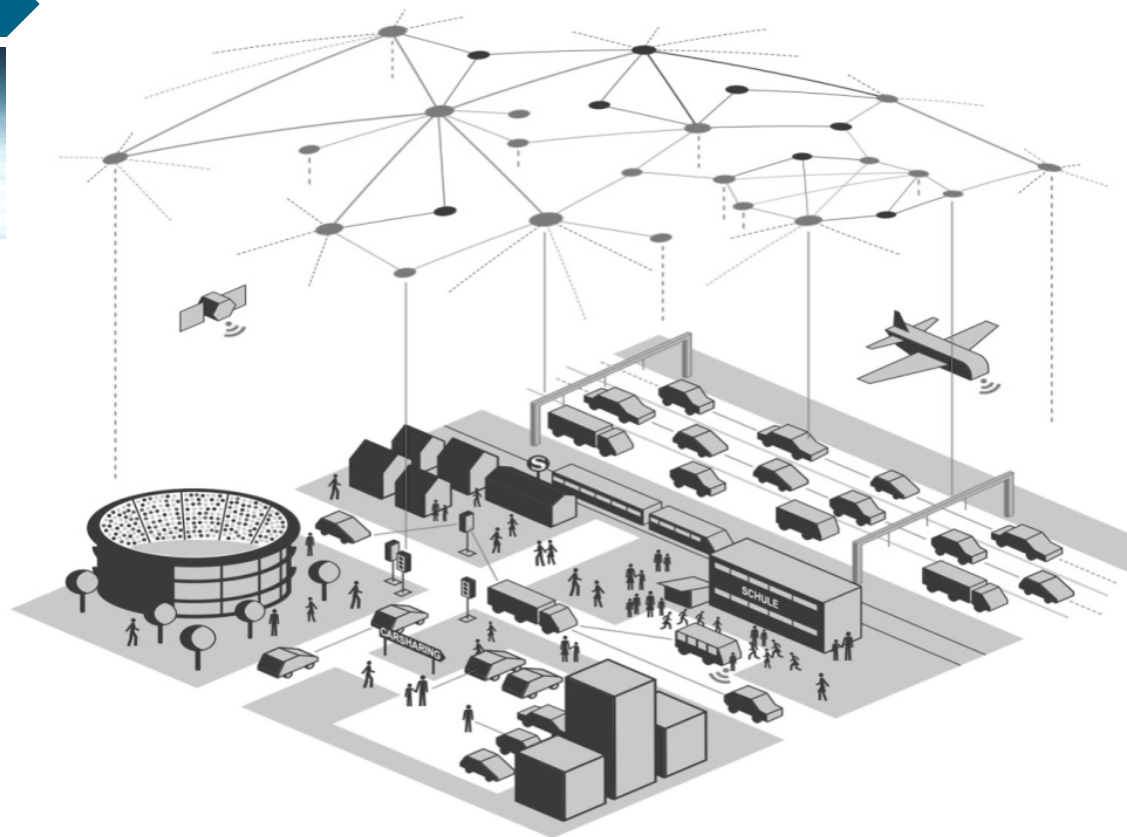
Digitalization



Automation



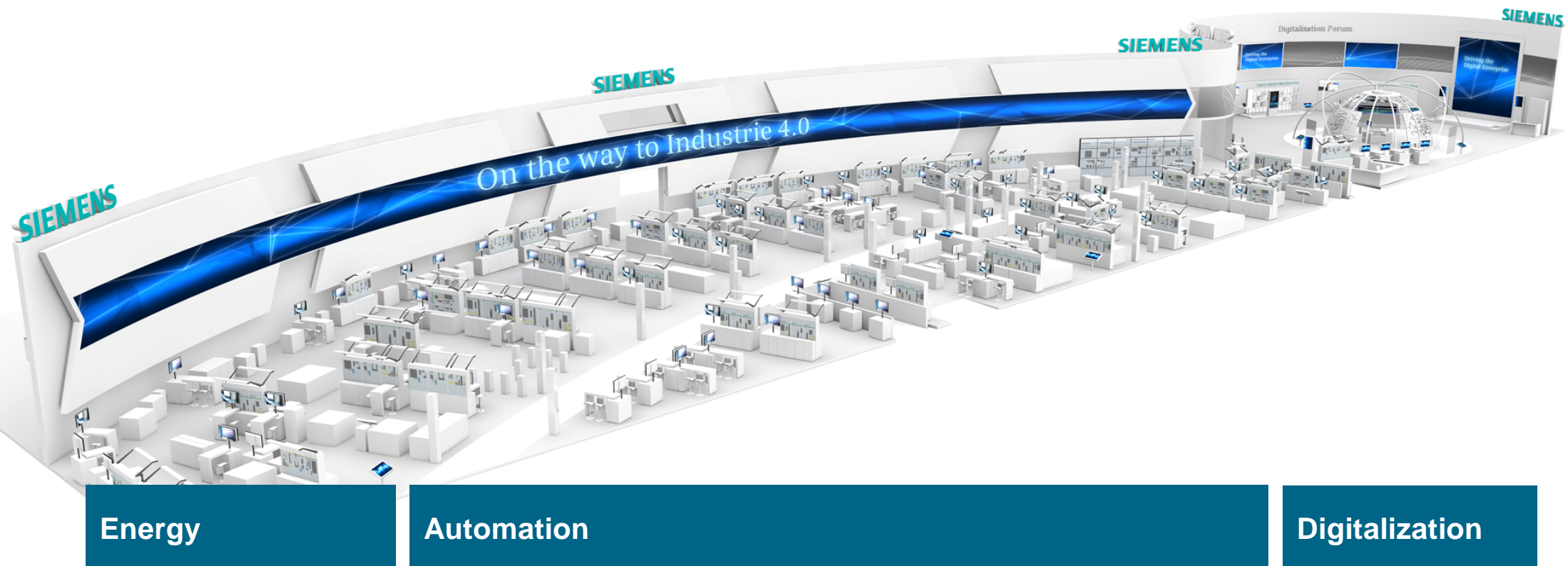
Electrification



Enablers

- Sensors
- Computing power
- Storage capacities
- Data analytics
- Networking ability

Siemens at the Hannover Messe 2015

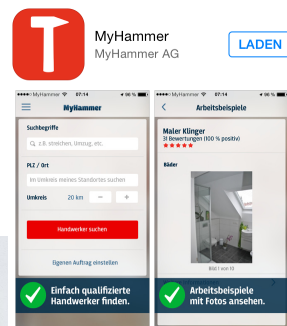
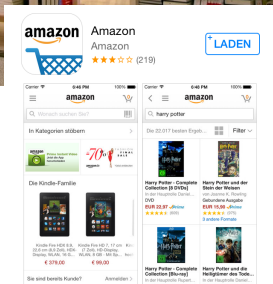


The Internet is revolutionizing the world of business

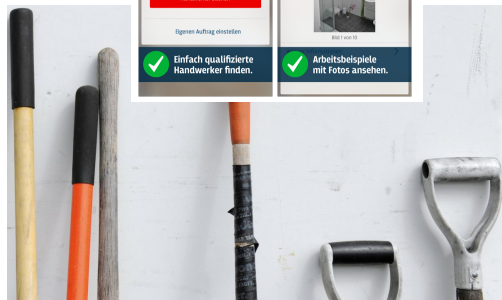


New business models in the Internet age

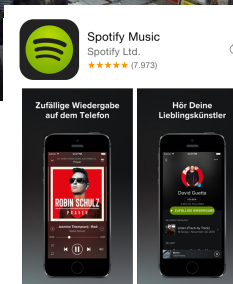
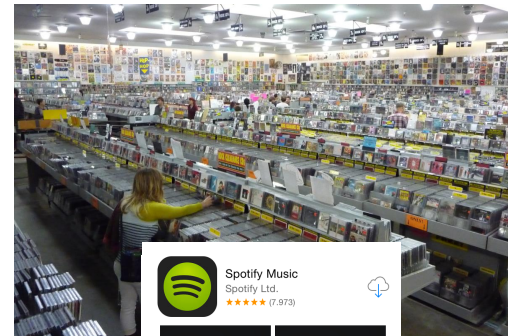
From bookstore
to e-book



From
Yellow Pages
to marketplace



From record store
to streaming



From taxi
to ride-sharing



The main challenges and drivers in the industrial environment

Shorten time to market



- Shorter innovation cycles
- More complex products
- Greater data volumes

Increase flexibility



- Individualized mass production
- Volatile markets
- High productivity

Boost efficiency



- Energy efficiency and resource efficiency are critical competition factors

Industrie 4.0 – A German future project for the vision of industrial production beyond the year 2025



Industrie 4.0 ...

- Represents a new level of organization and control of the entire value chain, across the life cycle of products
- Is increasingly geared to individualized customer wishes
- Encompasses all phases from the idea and the order to development and production, delivery of a product to the end customer, even recycling and related services

Key research areas

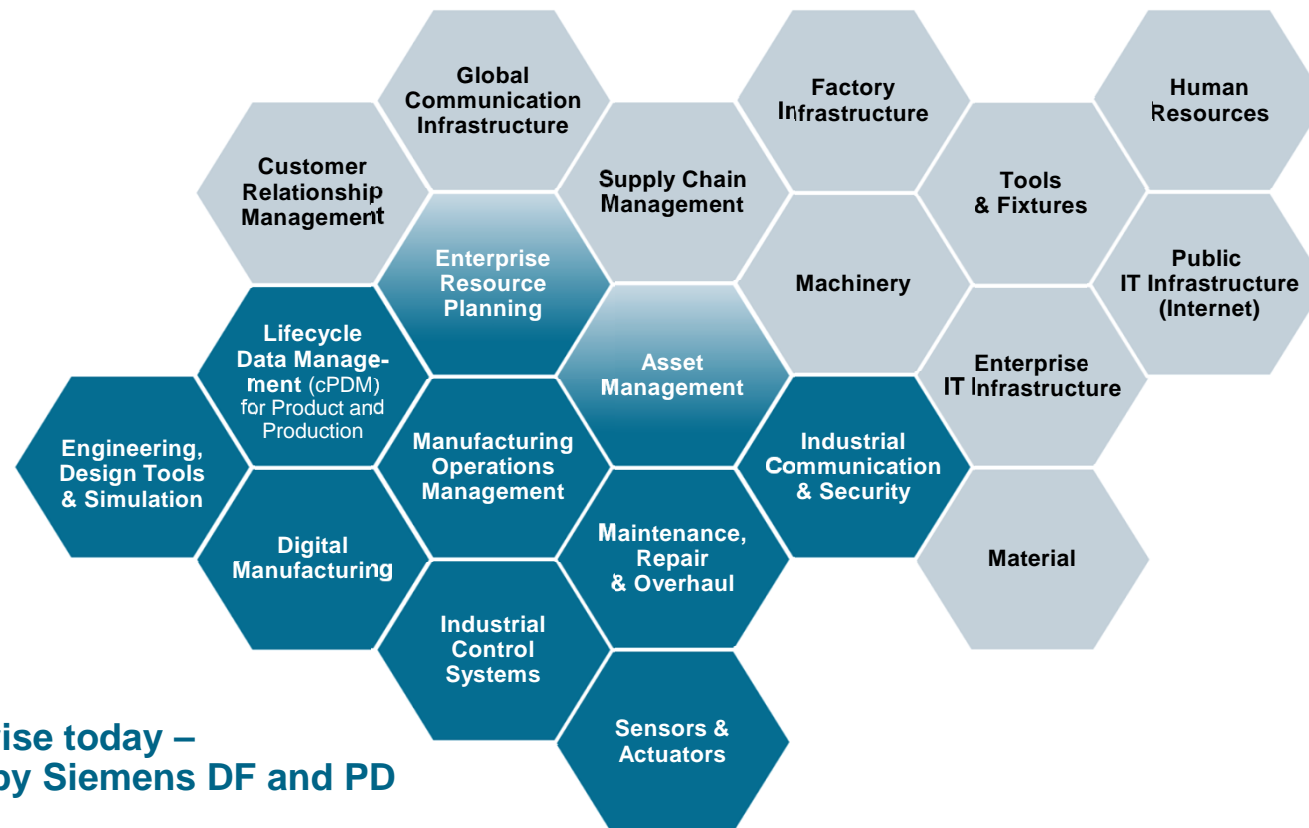
- Horizontal integration via value-added networks
- End-to-end engineering across the entire value chain
- Vertical integration and networked production systems

Source: acatech, April 2013 "Recommendations for implementing the strategic initiative Industrie 4.0"

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Industrie 4.0 affects all elements of the value chain

Digital Enterprise is the Siemens solutions portfolio



The Digital Enterprise today – Domains covered by Siemens DF and PD

Digitalization takes different forms in the industries

Siemens offerings for the future of industry

Discrete Industry

Process Industry

Product design

Production planning

Production engineering

Production

Service

Product design

Process & plant design

Engineering

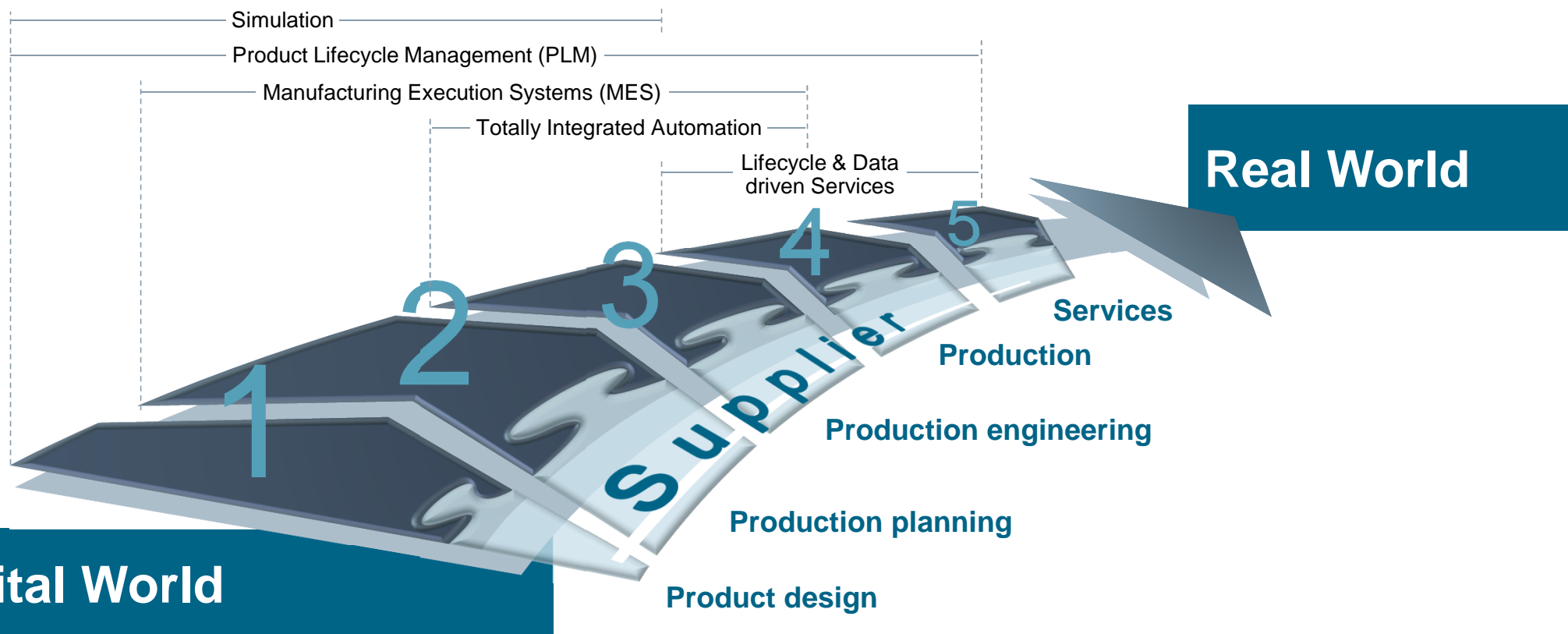
Operation

Service



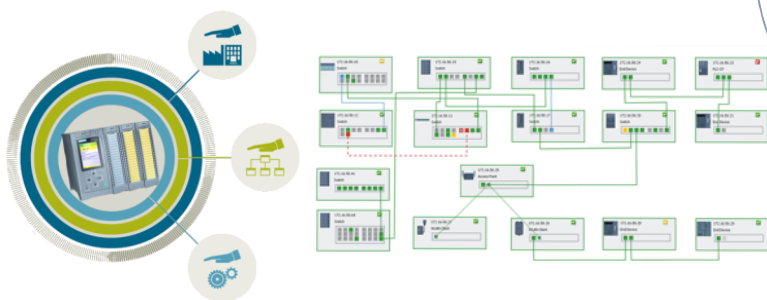
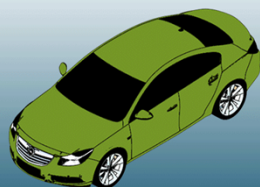
Digital Enterprise

Discrete industry – The entire value chain from product design to service is digitalized and integrated



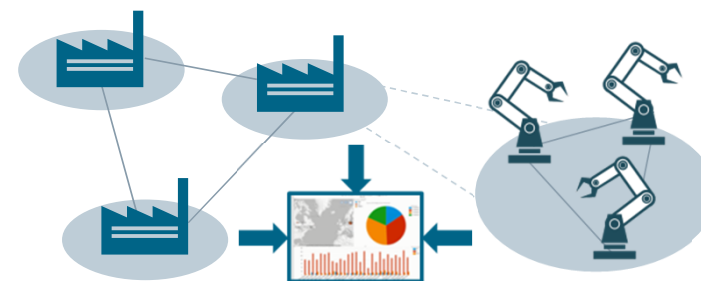
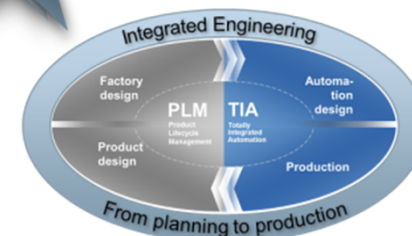
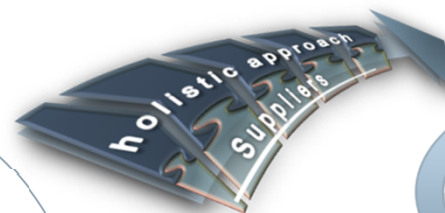
Cornerstones of the Digital Enterprise

Use of intelligent models



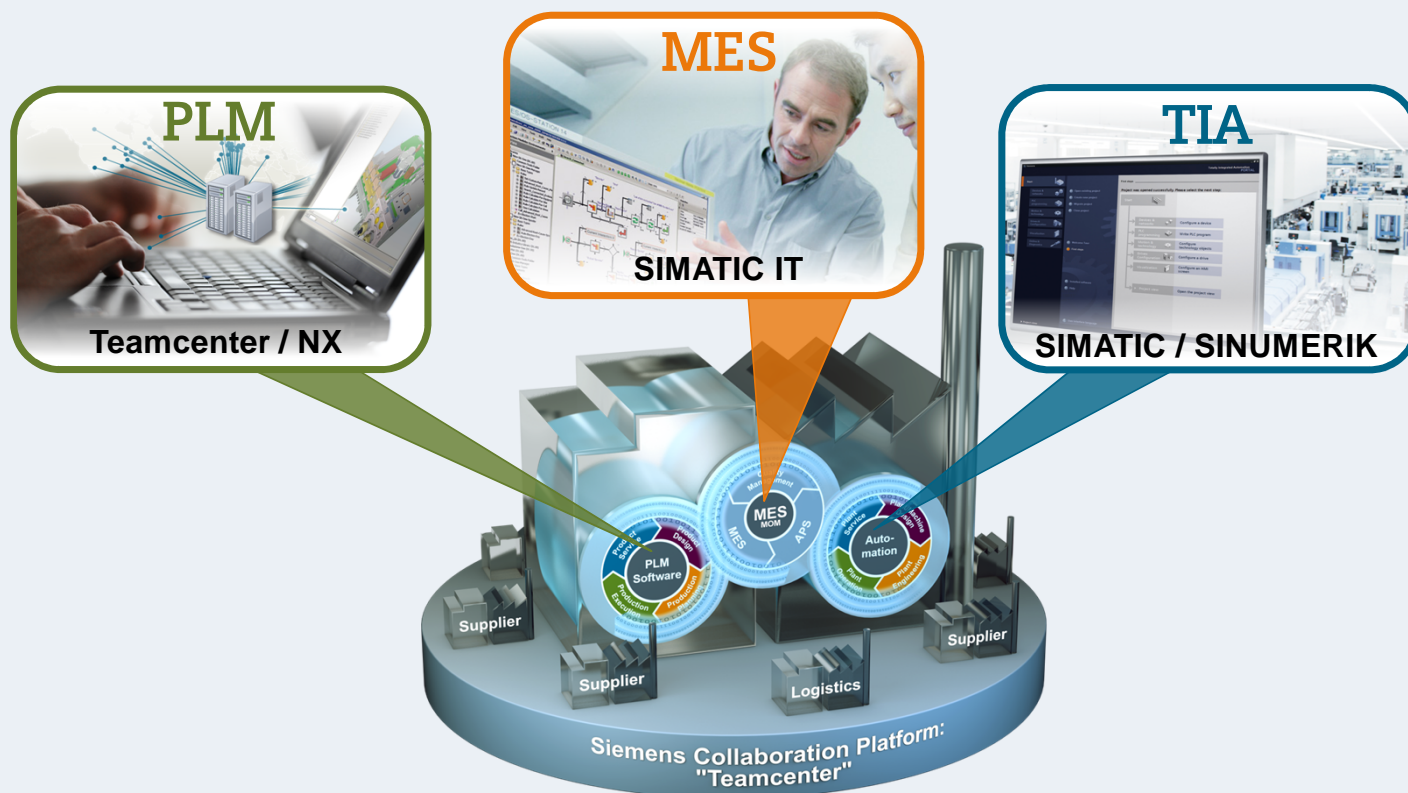
Modular, networked, secure automation

Integrated value chain with seamless engineering



Transparent factories, internally and externally networked

“Digital Enterprise”: The Siemens portfolio of solutions for the stepwise implementation of Industrie 4.0



The logical way – Step by step into the digital world



Four steps on the way to the Digital Enterprise for small and medium-sized enterprises

- 1 | Digital Enterprise Software Suite
- 2 | Industrial communication networks
- 3 | Security in automation
- 4 | Business-specific industrial services

Our software solutions for the Digital Enterprise fulfill all needs of industry

Design and virtual production

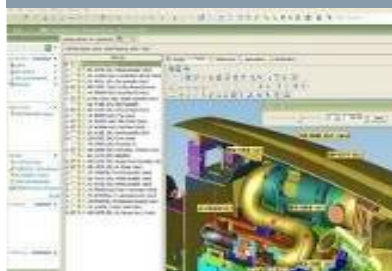
NX



Computer Aided Design/ Engineering/ Manufacturing (CAx)

Digital development of products

Teamcenter



Collaborative Product Data Management (cPDM)

Global collaboration across the entire value chain

Tecnomatix



Digital Manufacturing (DM)

Simulation of production processes

Real production

Simatic IT



Manufacturing Execution Systems (MES)

Complete overview of the manufacturing process

Simatic S7

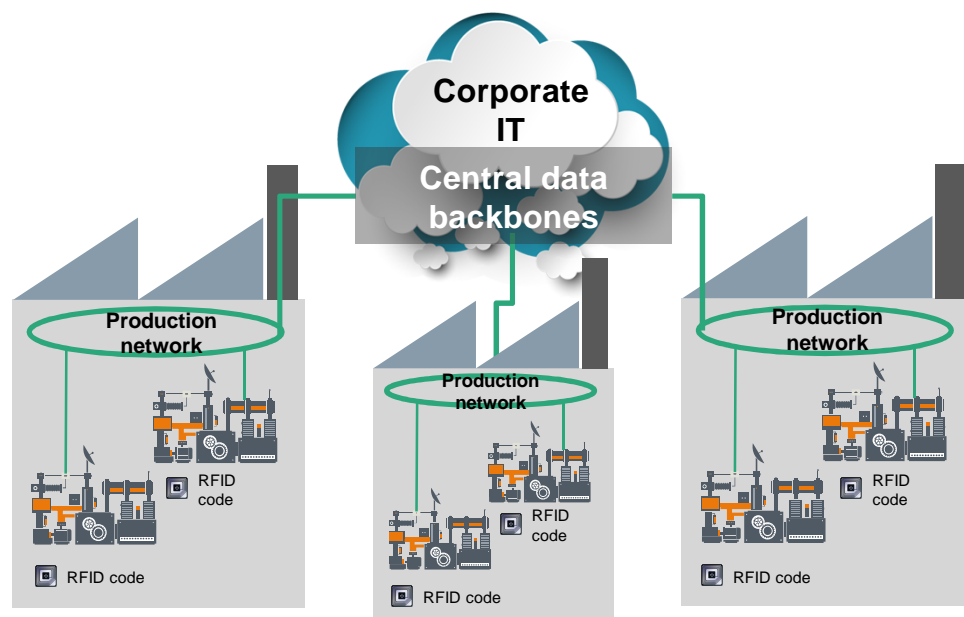


Command & Control (C&C)

Steering and control of individual manufacturing steps

Our offering for low-cost, secure, end-to-end communication in industry

End-to-end communication across companies, production facilities and field sensors with PROFINET



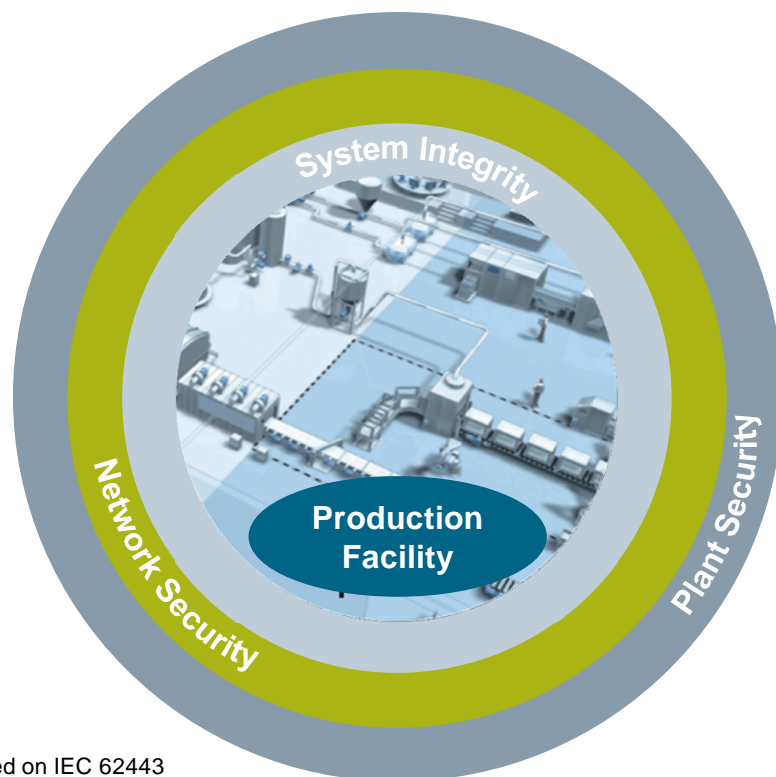
Automated configuration of IP communication

Assignment of IP addresses directly in the machine and **automatically configured IP routing**

- Flexible and quick configuration and reconfiguration
- Relocation of address administration from engineering to run-time
- Simplification for remote service, with improved security

Our offering for comprehensive security in industry

The Siemens security concept* – “Defense in Depth”



Products and systems with integrated security

- Copy and manipulation protection
- Authentication and user management
- Firewall & VPN (Virtual Private Network)
- System “hardening”

SCALANCE S family	SCALANCE M family	CP 343-1 Adv CP 443-1 Adv	S7-1200 CPU 1) S7-1500 CPU	CP 1243-1 1) CP 1543-1	CP 1628	SOFTNET Security Client

1) CPU Firmware V4.0 and higher; STEP 7 Professional V13 (TIA Portal) and higher.

Industrial Security Services



* Based on IEC 62443

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Our portfolio of digital, data based services for all requirements in the industrial environment

Siemens Plant Data Services Portfolio

Siemens Plant Cloud Services¹⁾



- Open industrial cloud platform, including standardized device connectivity
- Eco-systems for customers and analytics partners
- Siemens as “data custodian”

Siemens Plant Analytics Services



- Plant and asset optimization through
 - Asset Analytics
 - Energy Analytics
 - Process Data Analytics

Siemens Plant Security Services

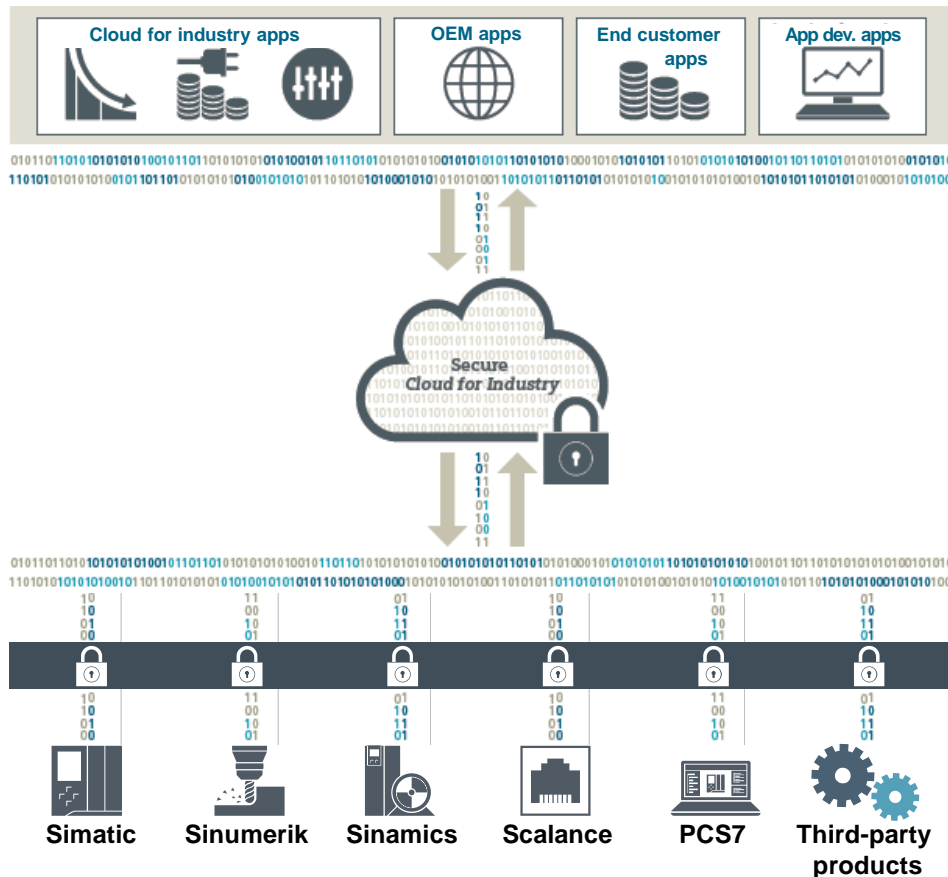


- Holistic security offering for industrial plants
- Ensuring data confidentiality and integrity as well as plant and asset availability
 - Plant assessment
 - Plant optimization
 - Managed Security Service

1) Currently only pilot customers

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Siemens offers open cloud platform for industry customers based on SAP HANA technology

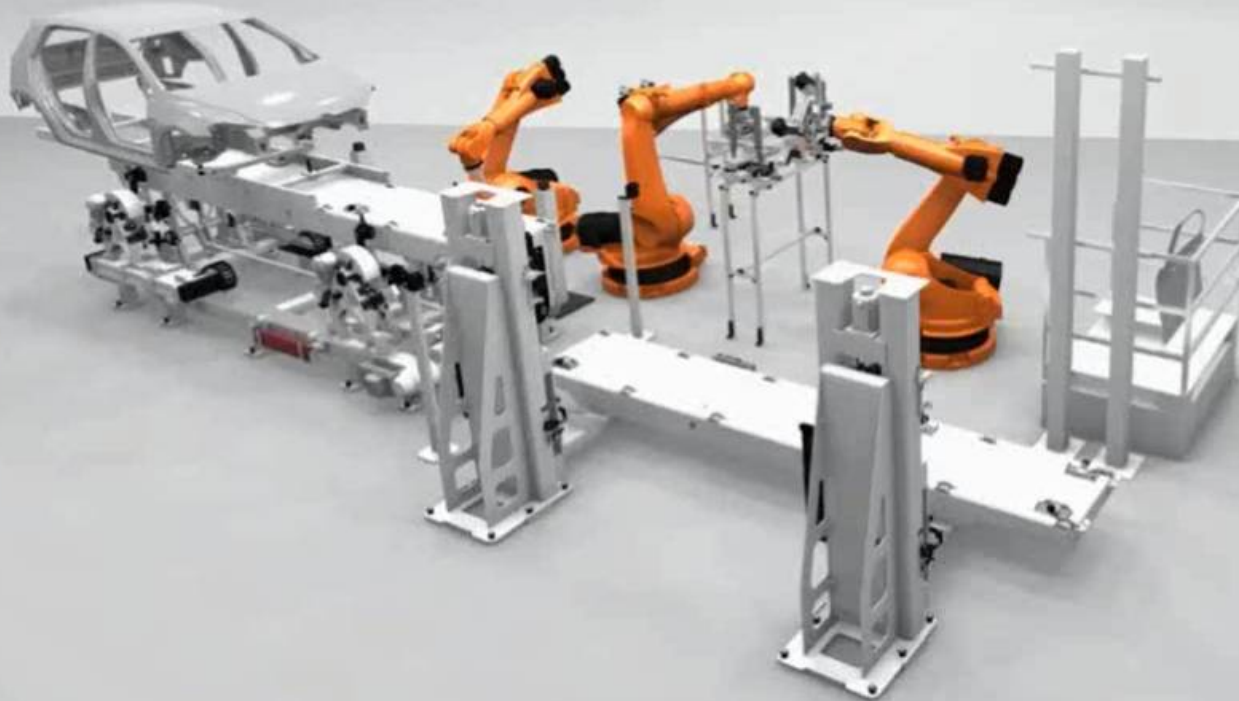


Optimization of plants and machines as well as energy and resources

- **Open standard (OPC)** for connectivity of Siemens und third-party products
- **Plug and play connection** of Siemens products (engineering in the TIA Portal)
- **Cloud for industry** with open application interface for individual customer applications
- Optional **cloud infrastructure** – public cloud, private cloud or on-premise solution
- Transparent **pay-per-use pricing model**
- Opportunities for completely new **business models** (e. g. selling machine hours)

At last year's Hannover Messe, the focus was on applications for larger enterprises ...

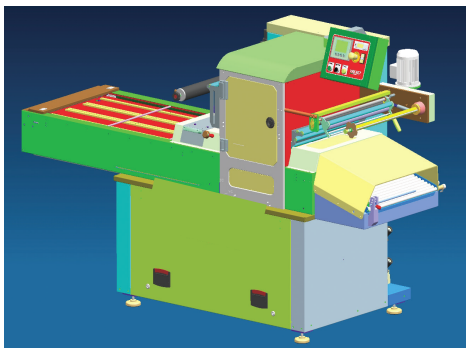
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Production line for the automated installation of doors to a VW Golf 7: systematic linkage of data, innovative industry software and powerful production hardware

... this year, we are showcasing the scalability of our solutions in small and medium-sized enterprises

- **CB & VALKO s.r.l.** (Italy, 50 employees combined)
- Catering equipment suppliers for polyvalent cooking appliances, electrical convection ovens, vacuum packaging machines, etc.



Digital model



Realized vacuum packaging machine

Increase of competitiveness

- **Time to market:** working prototypes ready one month after design completion
- **Flexibility:** 6 new product models designed every year from scratch
- **High variance:** more than 500 different product models regularly managed and updated in Teamcenter

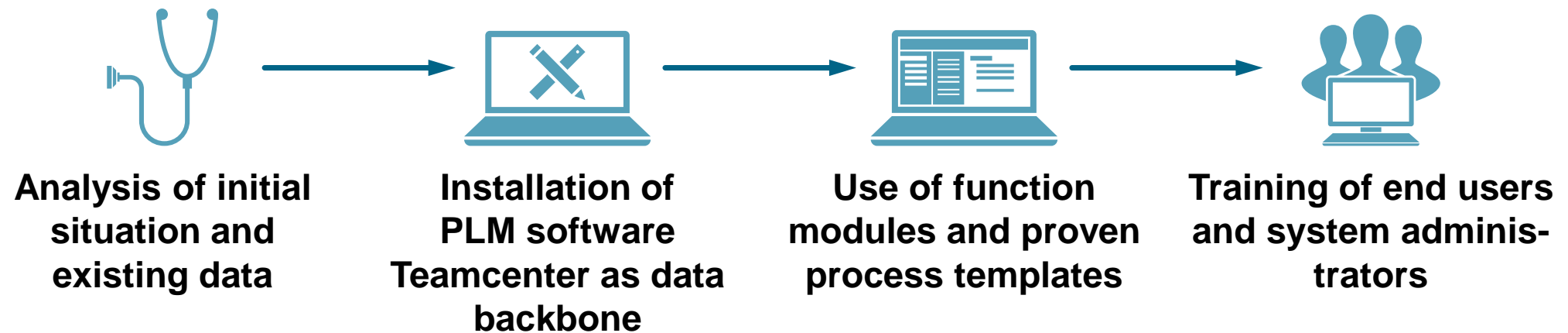
Stronger digitalization of the production processes

- **NX** for design of complete machines
- **Teamcenter** as uniform data platform

“
Teamcenter can be implemented without having to make major adjustments.
The software is thus ideally suited for small and medium-sized enterprises like ours.”

Example of small and medium-sized enterprises: CB and VALKO s.r.l. Italy

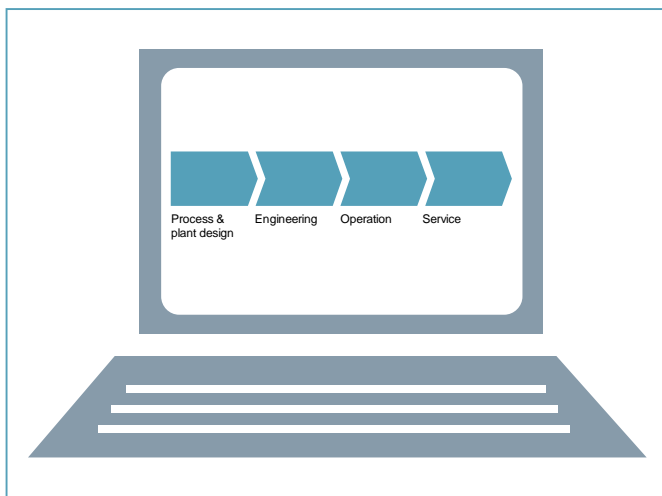
Recommended steps for digitalization in midsize companies



Thanks to a structured implementation process, Teamcenter is completely ready for use within **10 days**:

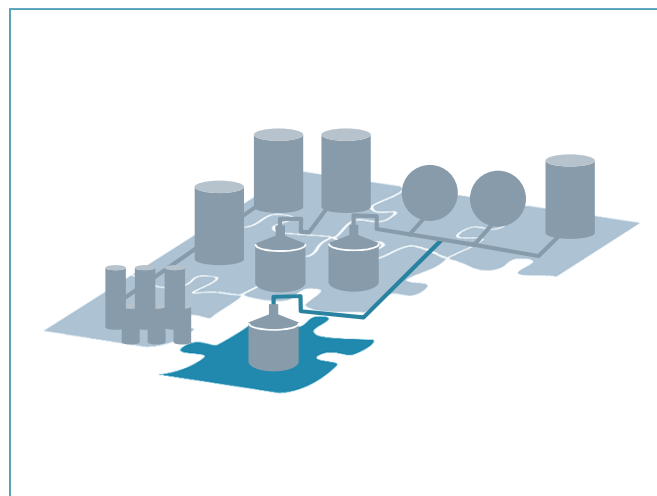


Components of the Digital Enterprise in the process industry



1 Digital Plant design and processes

Use of a **shared data model** to generate value-added in design, engineering, operation and service



2 Modularization

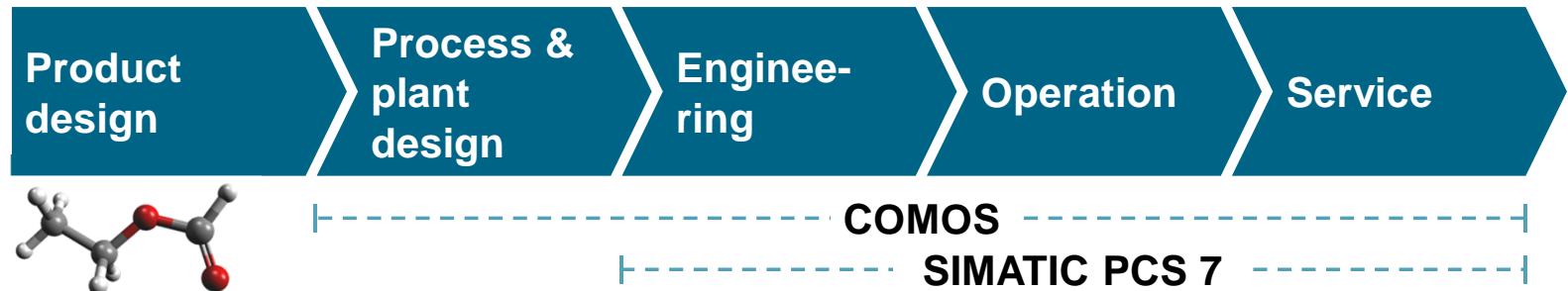
Greater flexibility through the combination of pre-configured operational units via standardized interfaces



3 Production Excellence

Increased productivity through resource efficiency, throughput optimization and highest process quality

Integrated engineering as efficiency driver in the process industry – Example BMA



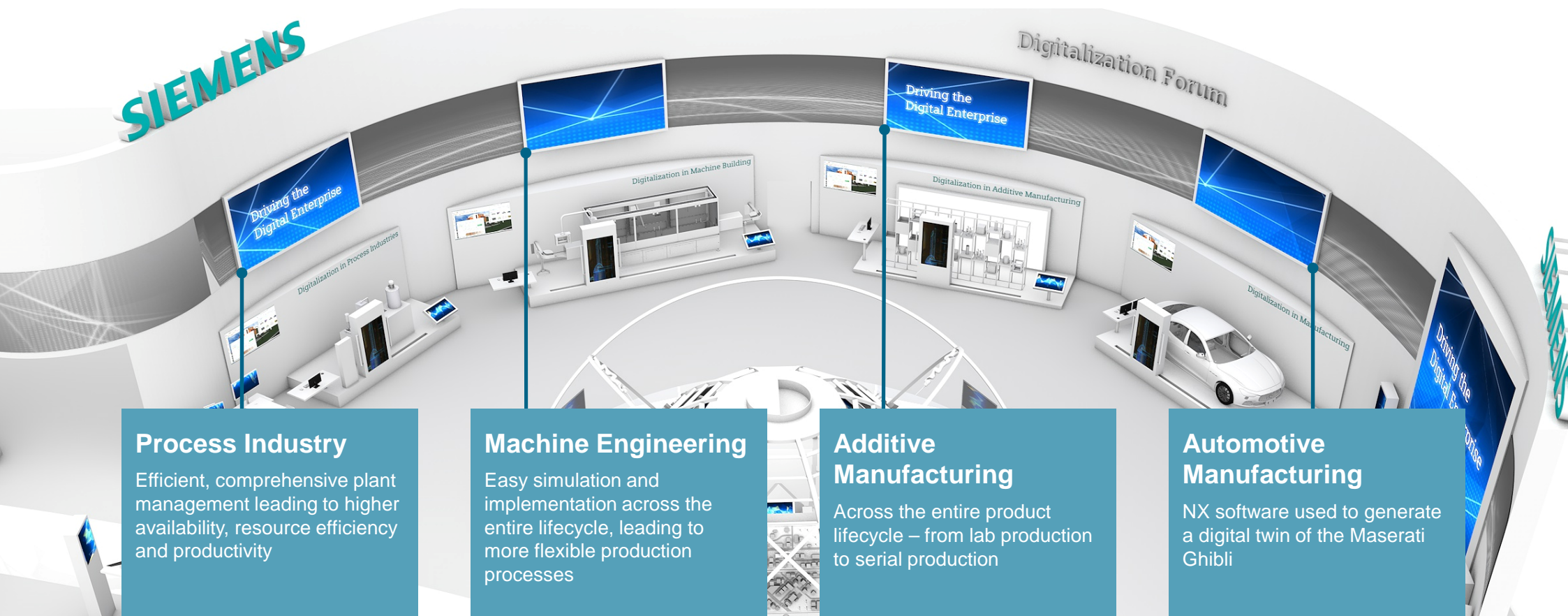
Integrated engineering with COMOS/SIMATIC PCS 7

- Effort for the creation of typicals reduced by 25%
- 60% of the plant generated from typicals in COMOS
- Project failures minimized
- Time savings for the customer



BMA benefits from an optimal integration of both systems and a continuous workflow

Siemens at the Hannover Messe 2015 – The showcases at the Siemens booth show which solutions we can already offer today



Process Industry

Efficient, comprehensive plant management leading to higher availability, resource efficiency and productivity

Machine Engineering

Easy simulation and implementation across the entire lifecycle, leading to more flexible production processes

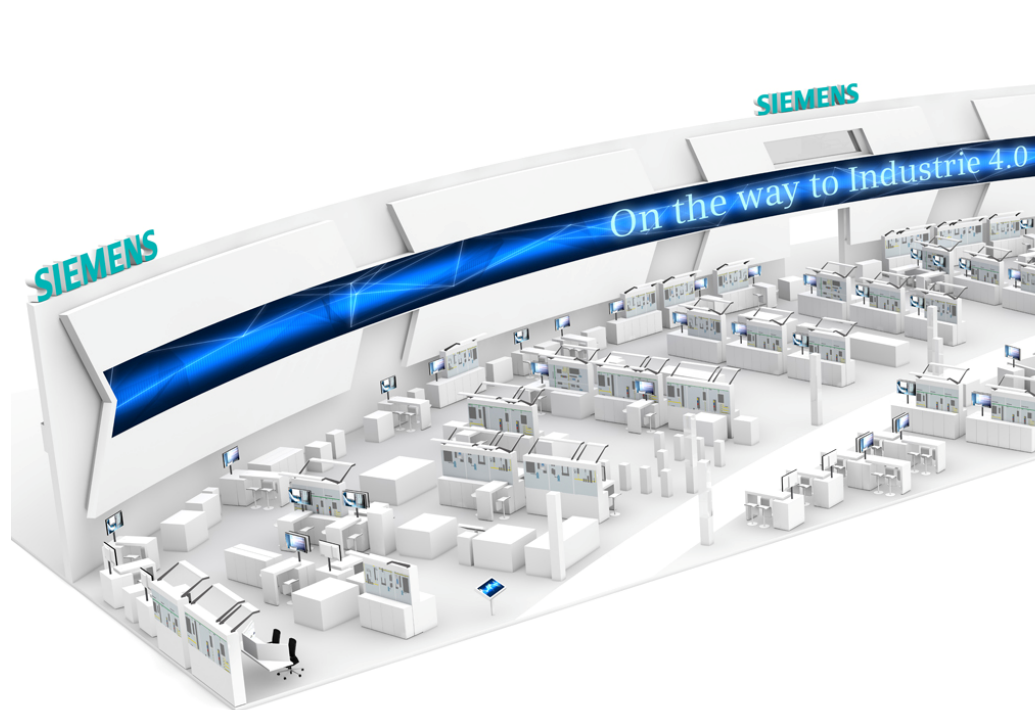
Additive Manufacturing

Across the entire product lifecycle – from lab production to serial production

Automotive Manufacturing

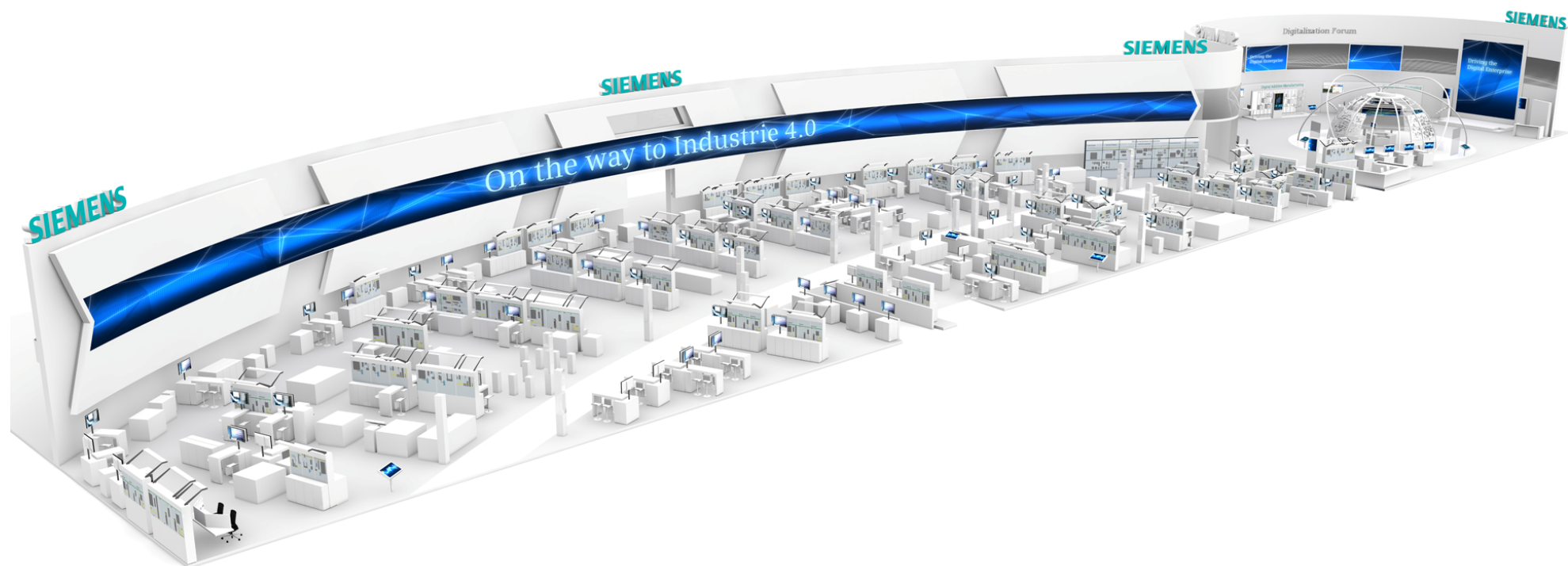
NX software used to generate a digital twin of the Maserati Ghibli

Siemens at the Hannover Messe 2015



- The Digital Enterprise is our innovative portfolio of solutions for the implementation of Industrie 4.0 in enterprises of all sizes
- Digital Enterprise portfolio elements are already available today
- Digital Enterprise comprises four core elements:
 1. Digital Enterprise Software Suite
 2. Industrial communication networks
 3. Safety in automation
 4. Business-specific industrial services

Already today, customers can invest in future-proof solutions for Industrie 4.0 with Siemens' Digital Enterprise



Visit us in Hall 9

A photograph of a Siemens press conference at the Hannover Messe 2015. In the foreground, a large digital display shows a complex industrial process with various data points and text prompts such as "Have (much) performance and energy efficiency is hidden in your plant?", "Have you tapped all sources of additional revenue?", and "Do the physical energy systems really offer the best savings potential?". The background is a blurred exhibition hall with other attendees and displays.

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Siemens press conference at the Hannover Messe 2015

On the Way to Industrie 4.0 – The Digital Enterprise