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Journey Towards Digitalization Industrie 4.0 Seminar for SMEs 15 June 2017

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Agenda

- Overview of Siemens Digitalization
- Digitalization In Discrete Manufacturing
- Digitalization in Process Industries
- Services

Digitalization Across Siemens Malaysia (By Divisions)

Digital Factory, Process Industries & Drives (DF PD)

- Digitalization in DF PD = TIA portal to reduce engineering cost, Digital Twin simulation, PLM software & automation that reduce time-to-market.
- **Reference project = SIMATIC S7 & control product for Chemicals Solutions for Faeth ASIA**

Mobility (MO)

- Digitalization in MO = Time-optimized service through technical intelligence and smart traffic control systems, efficient infrastructure and fleet management.
- **Reference project = Centralized traffic control for ERL**

Power and Gas (PG)

- Digitalization in PG = Addictive manufacturing, rapid prototyping, integrated design system for gas turbines, 3D simulation & monitoring
- **Reference project: Most commercially powerful SGT5-8000 H-class gas turbines for Pengerang CC Power Plant**

Energy Management (EM)

- Digitalization in EM = Agility and flexibility through intelligent technologies like smart grid network and decentralization that herald the future of energy systems / unleash power of utilities
- **Reference project = eMeter MDMS Phase 1 for TNB AMI Rollout**

Building Technologies (BT)

- Digitalization in BT = Use of intelligent technology and individualized services to create the experience of a smart building.
  Goals: Sustainability, efficiency and reduced cost

  Reference project = KLCC Fire Migration System

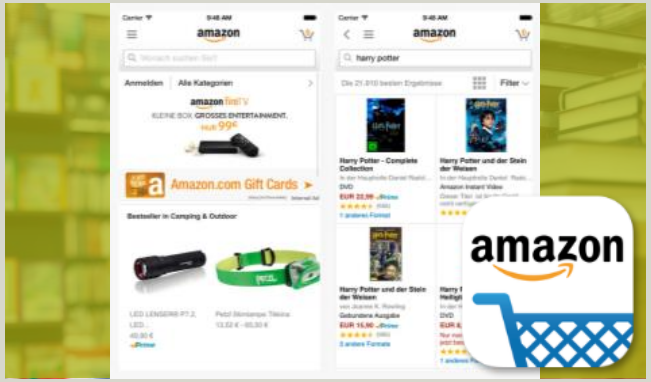
Power Generation Services (PS)

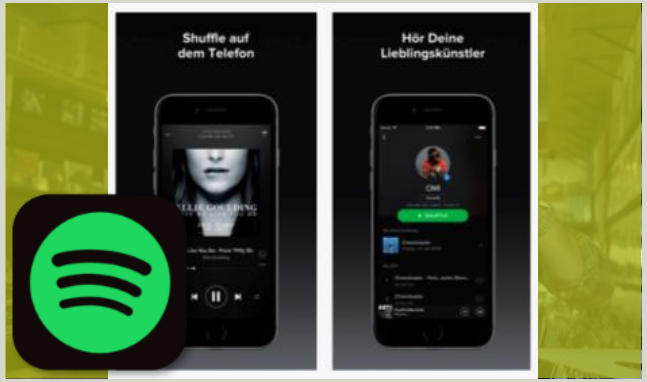
- Digitalization in PS = Predictive and preventive maintenance with access to real-time data, increased operational flexibility, remote ability to supporting outages, improved productivity in turbines
- **Reference project = TNB Prai CC Power Plant (2 most powerful gas turbines in SEA region, the H-class)**

Digitalization
changes
everything

New business models in the internet age are disrupting complete markets

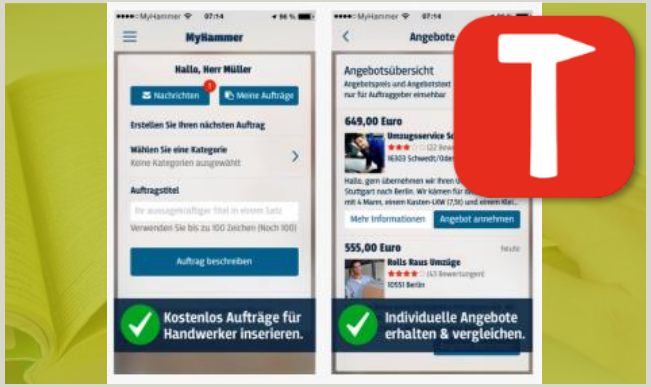
From **retail store** to **e-commerce**

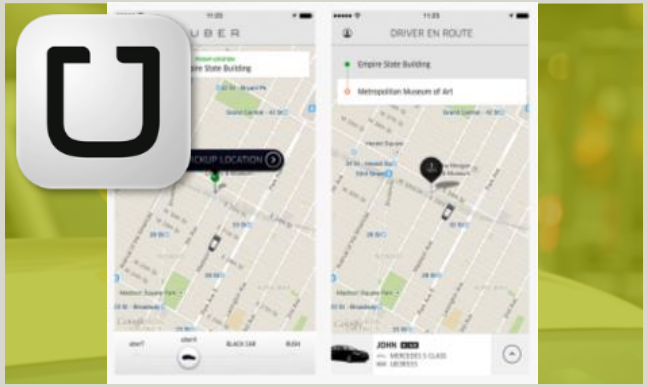




From **record store** to **digital stream**

From **Yellow Pages** to **marketplace**





From **taxi** to **ride sharing**

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Digitalization Changes Everything, Everywhere

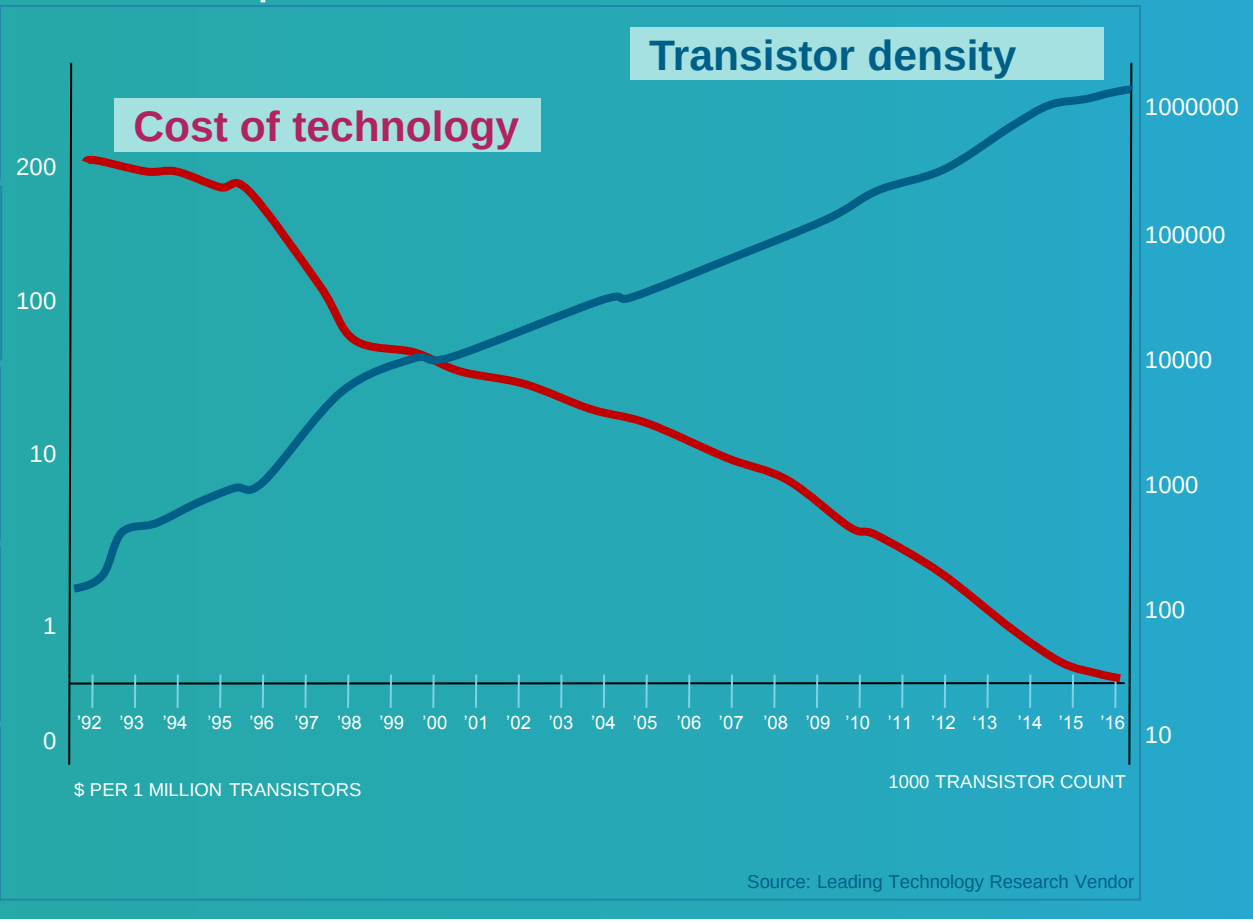
The pace of technological advances is fueling digital transformation

The cost of key technologies is falling

DRONES	2007	$100,000	COST PER UNIT
	2013	$700	
3D PRINTING	2007	$40,000	
	2014	$100	
INDUSTRIAL ROBOTS	2007	$550,000	
	2014	$20,000	
SENSORS	2007	$30,000	
	2014	$80	
SMART PHONES	2007	$449	
	2015	$10	

Source: Accenture Technology Vision 2015

Implications of Moore's Law



Source: Leading Technology Research Vendor

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In order to remain competitive manufacturing companies need to achieve enormous improvements in their processes

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Reducing the time to market

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

Product and production integrated

Enhancing flexibility

- Individualized mass production
- Volatile markets
- High productivity

Flexible production

Increasing Quality

- Closed loop quality processes
- Traceability and integrated genealogy

Full process transparency

Increasing efficiency

- Energy efficiency and resource efficiency as key competitive factors

Optimized production resources

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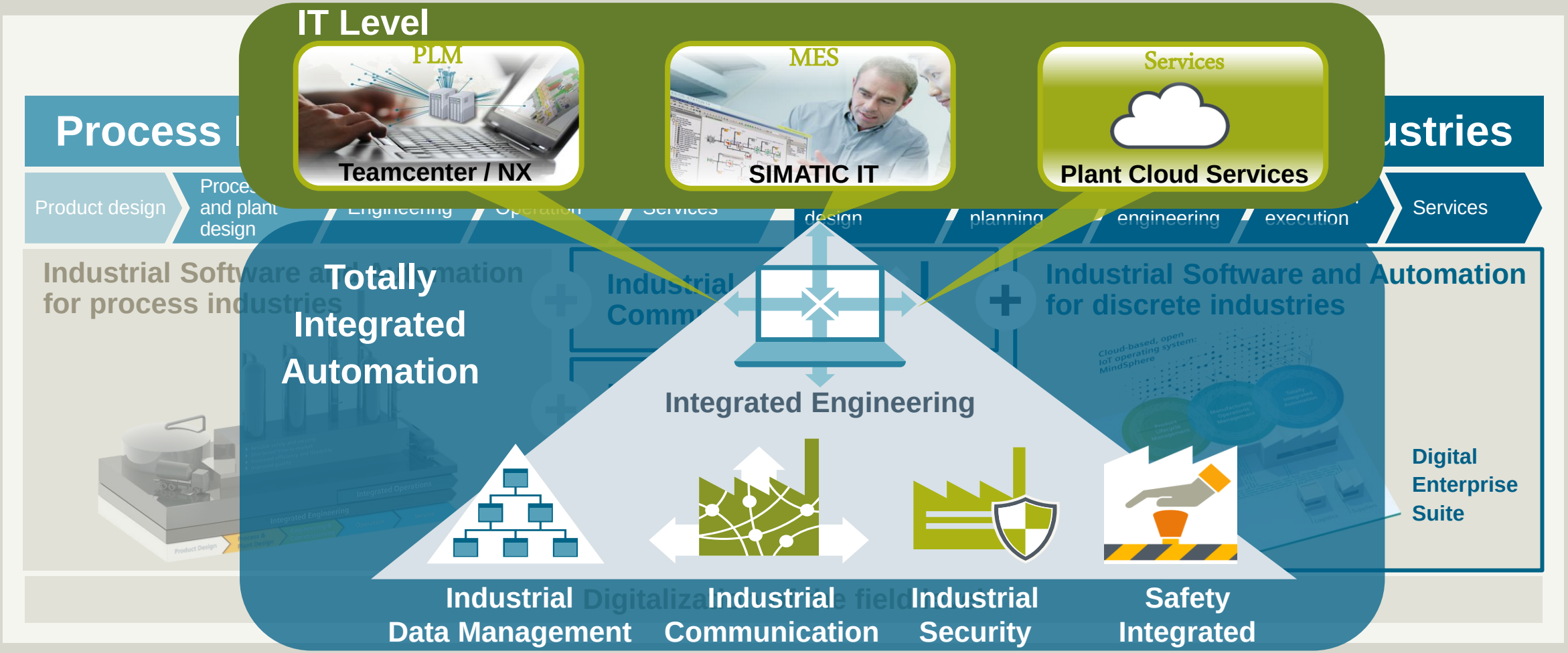
Digital Enterprise is our portfolio of solutions for the digital transformation



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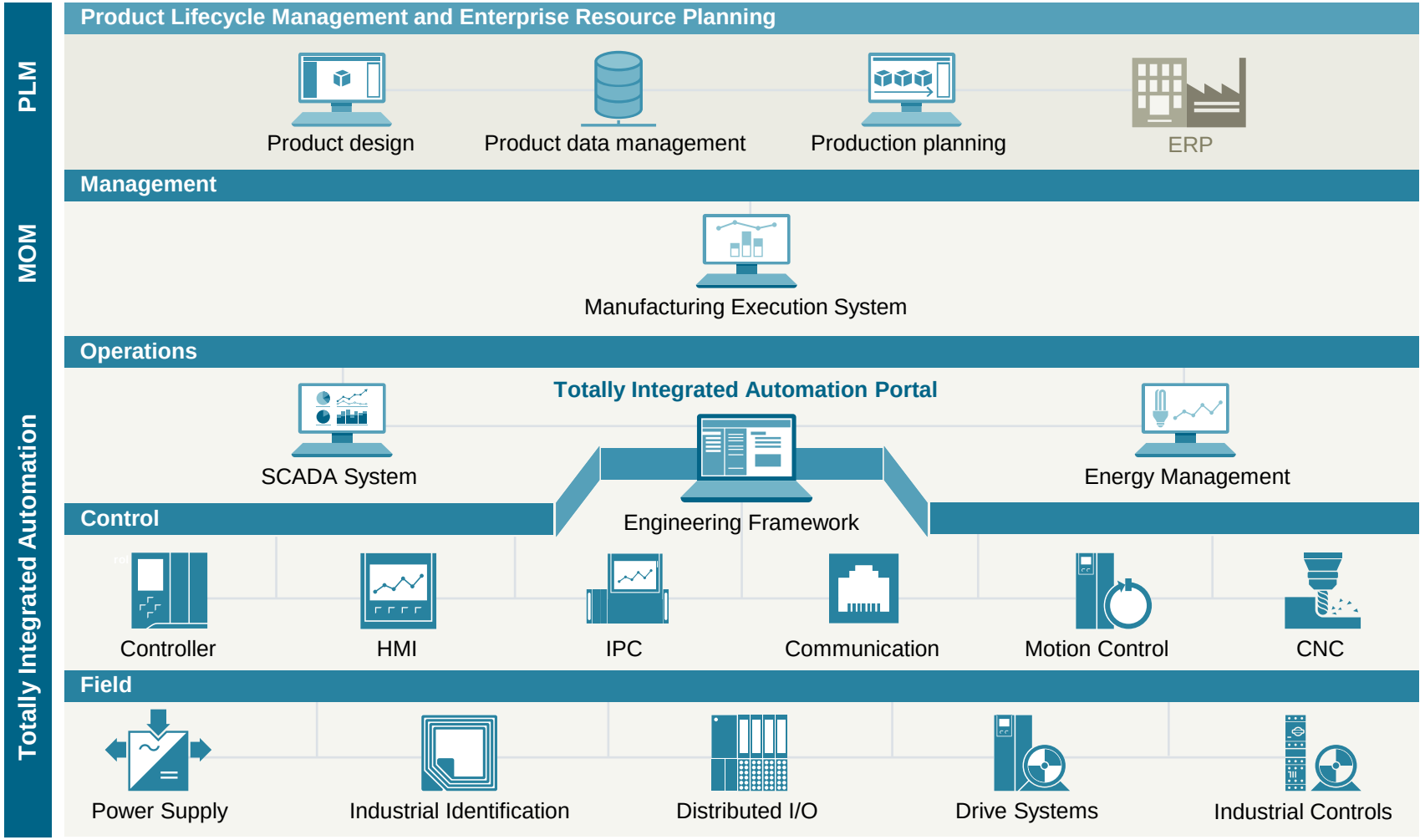
The automation portfolio for the Digital Enterprise with efficient interoperability of all automation components



Added value in all automation tasks

- Integrated Engineering
- Industrial Data Management
- Industrial Communication
- Industrial Security
- Safety Integrated

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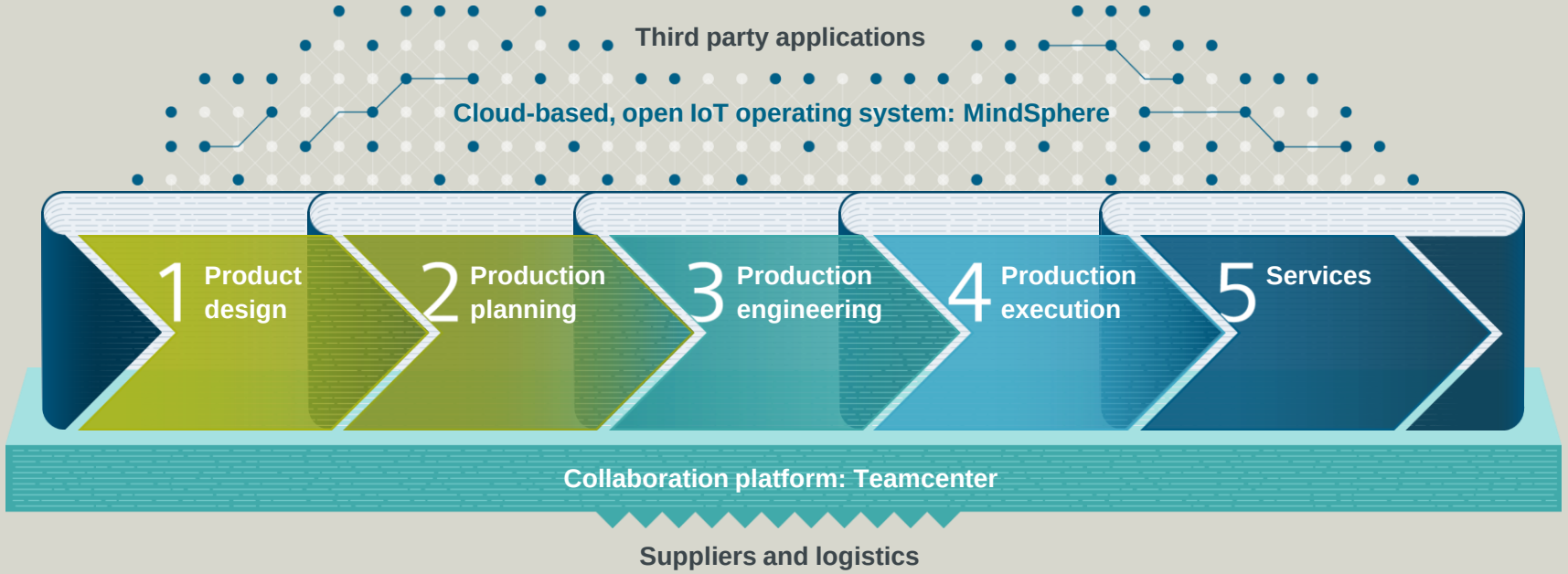
Integrating and digitalizing the entire value chain is key to staying competitive in the future



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Overview of Siemens Digitalization

Digitalization In Discrete Manufacturing

Digitalization in Process Industries

Services

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Holistic approach
Specific for end customers

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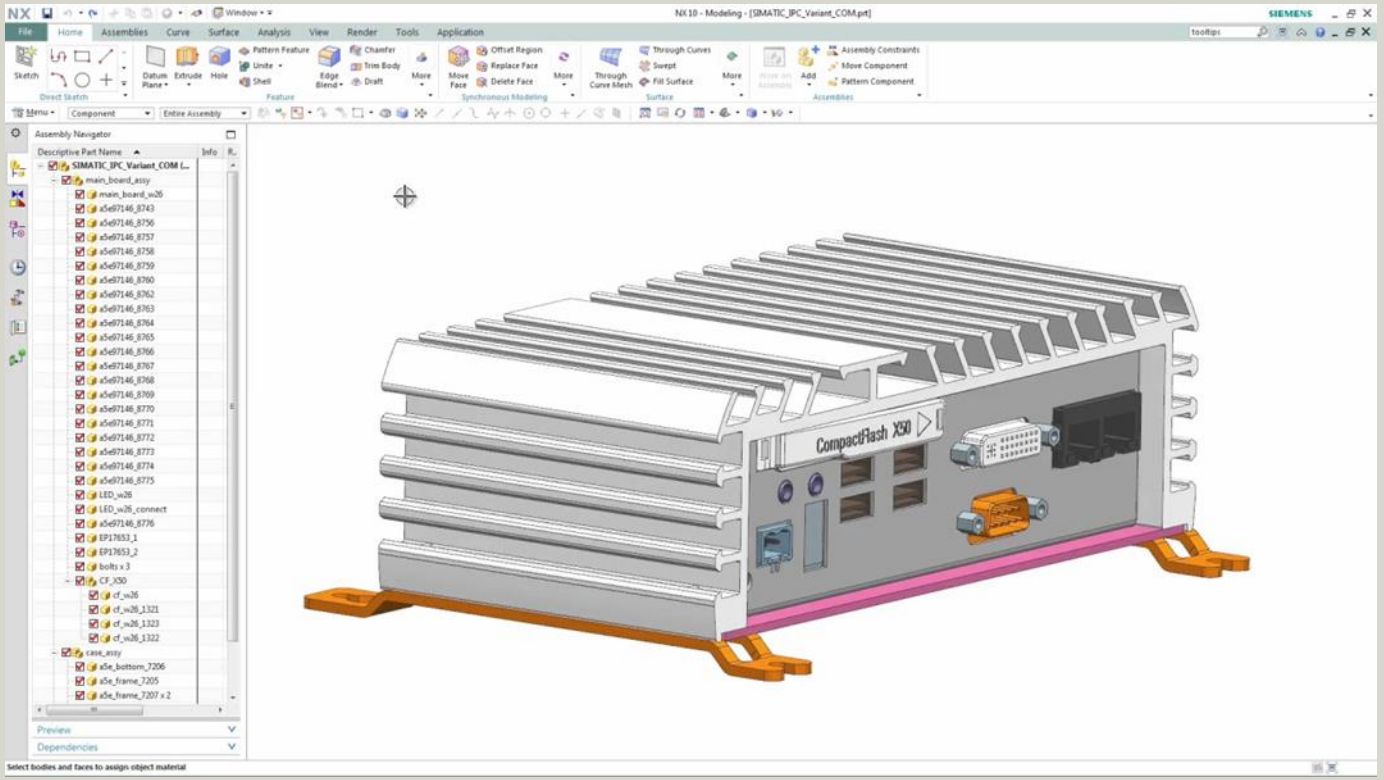
1 Product design | 2 Production planning | 3 Production engineering | 4 Production execution | 5 Services



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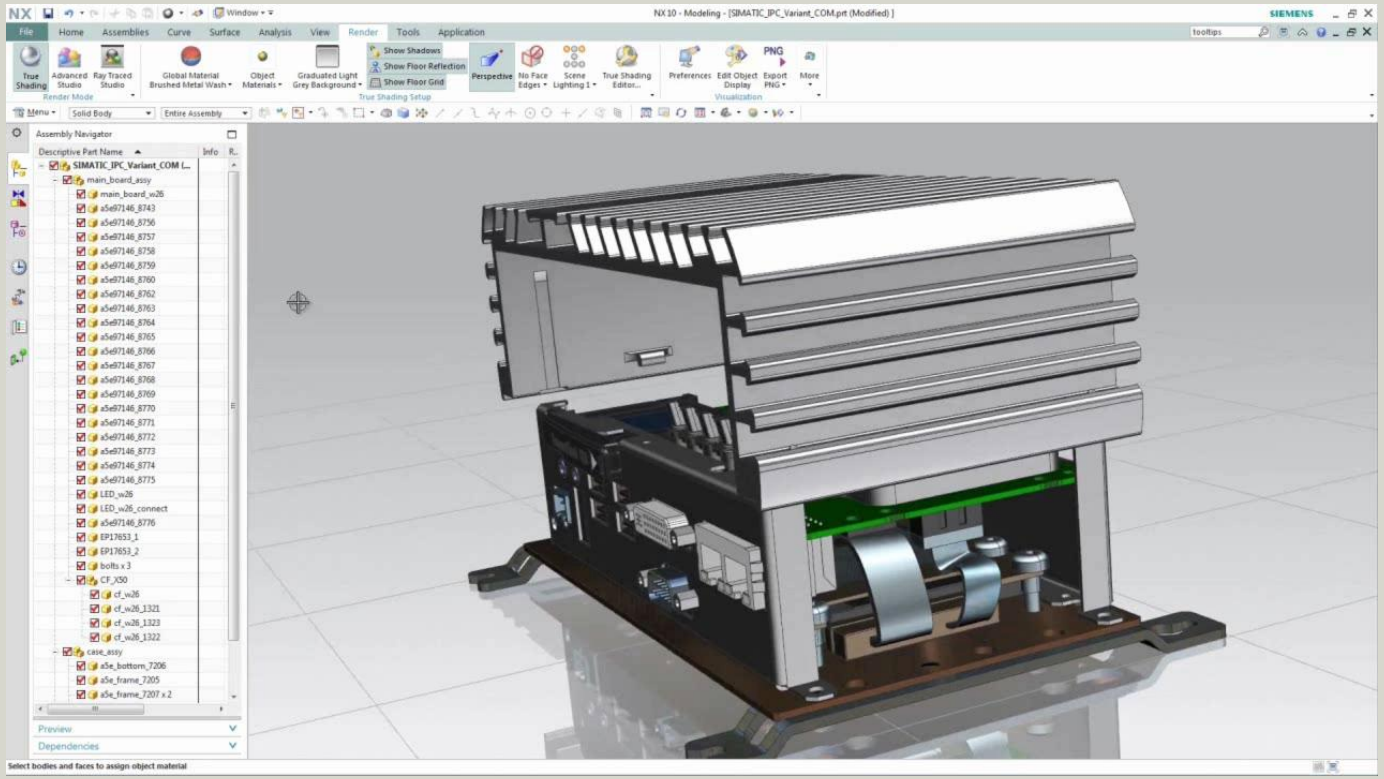
NX - Integrated CAD/CAE/CAM

1 Product design | 2 Production planning | 3 Production engineering | 4 Production execution | 5 Services



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Realizing innovation with 3D simulation

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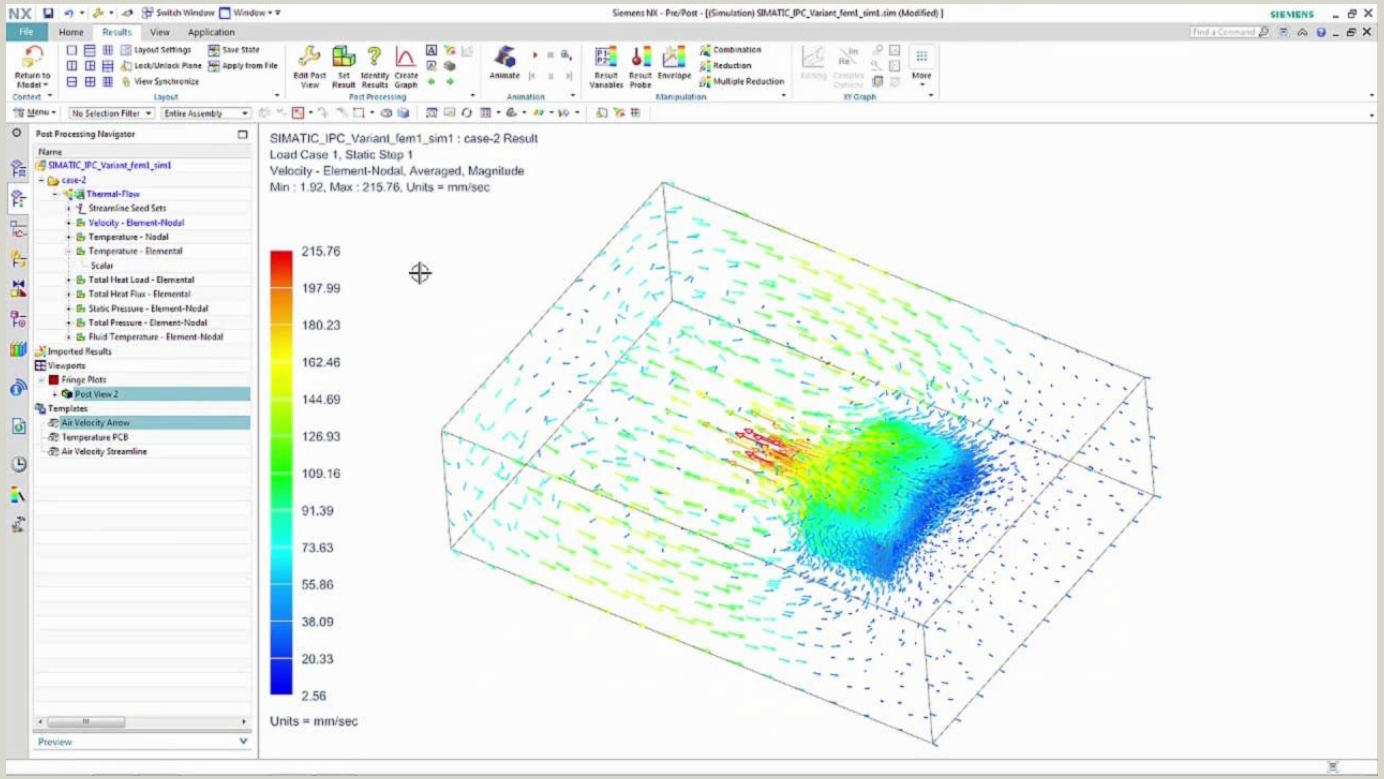
1 Product design | 2 Production planning | 3 Production engineering | 4 Production execution | 5 Services



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Human simulation to simulate, analyze, and optimize assembly processes and ergonomics

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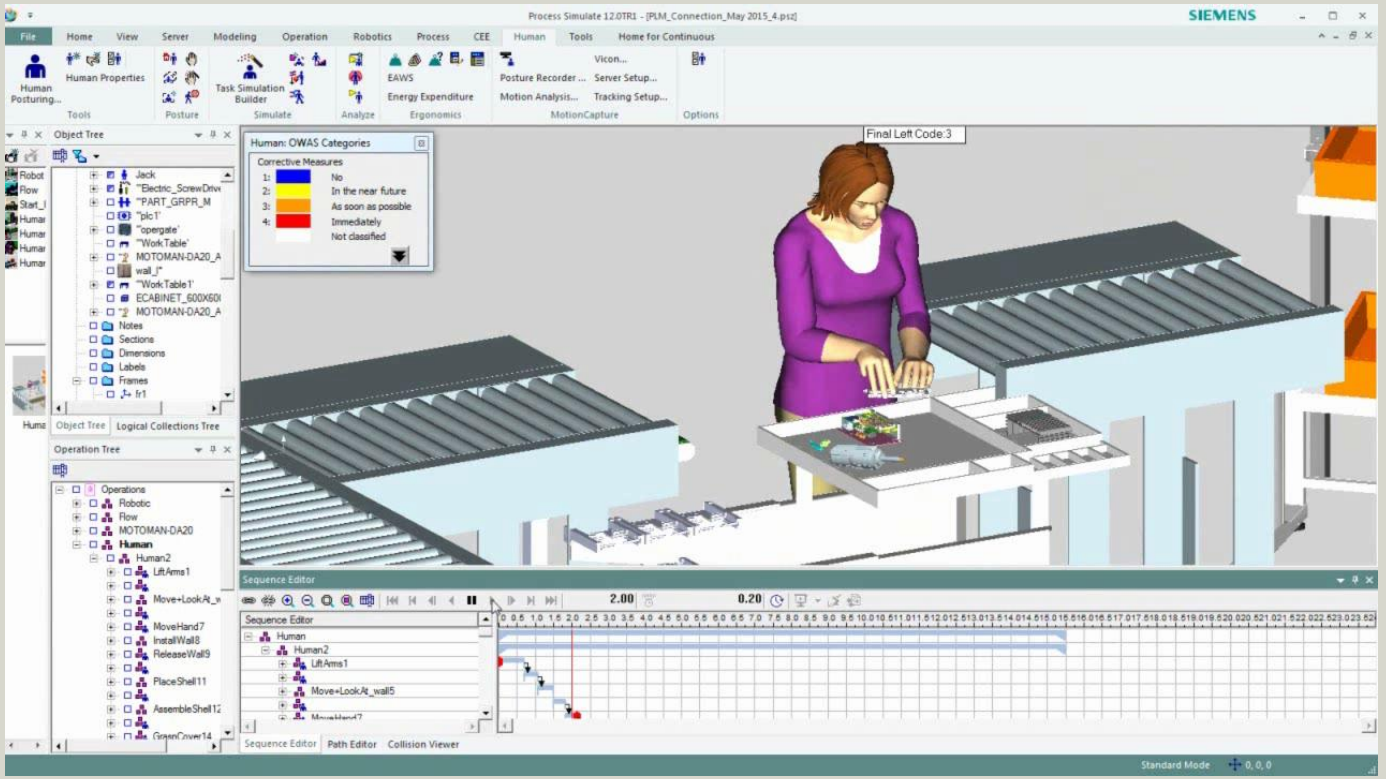

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Simulate, visualize, analyze, and optimize production systems and logistics processes

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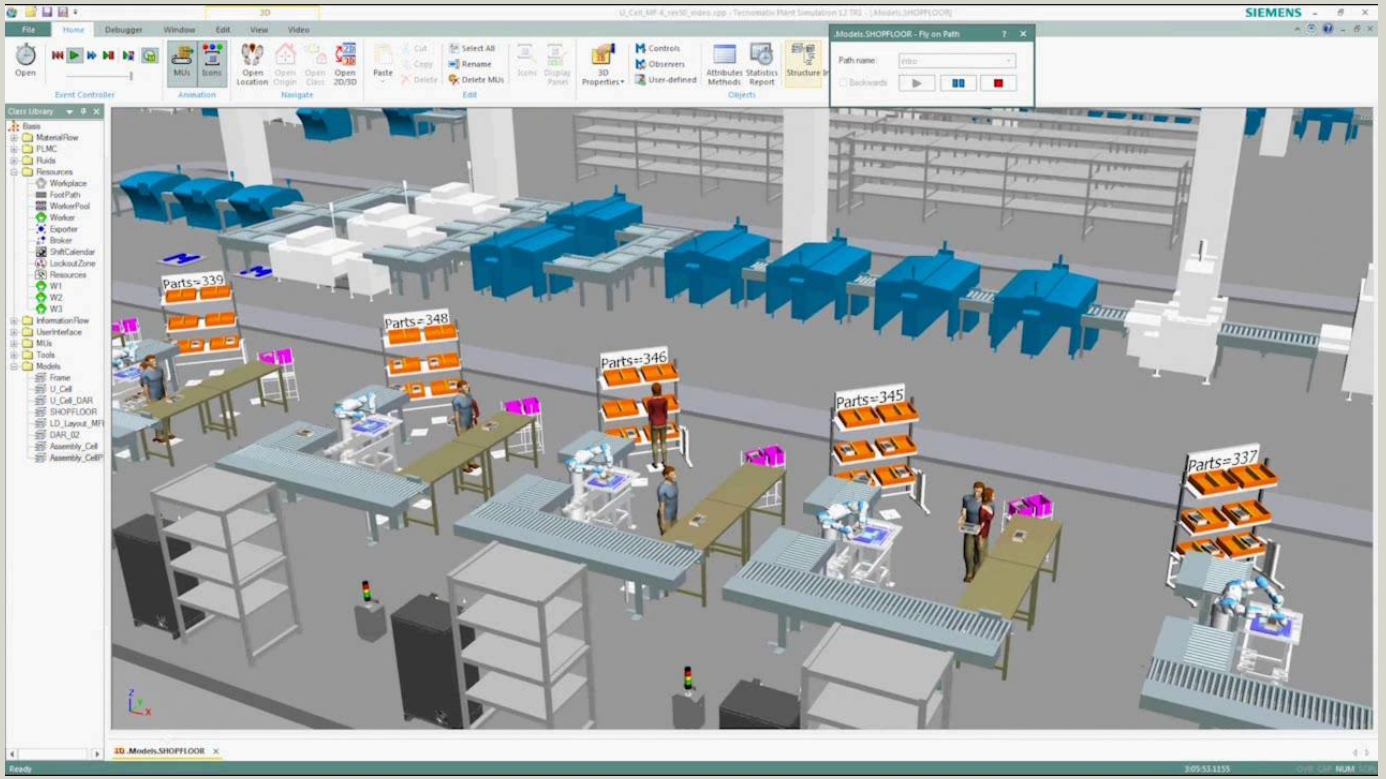
1 Product design | 2 Production planning | 3 Production engineering | 4 Production execution | 5 Services



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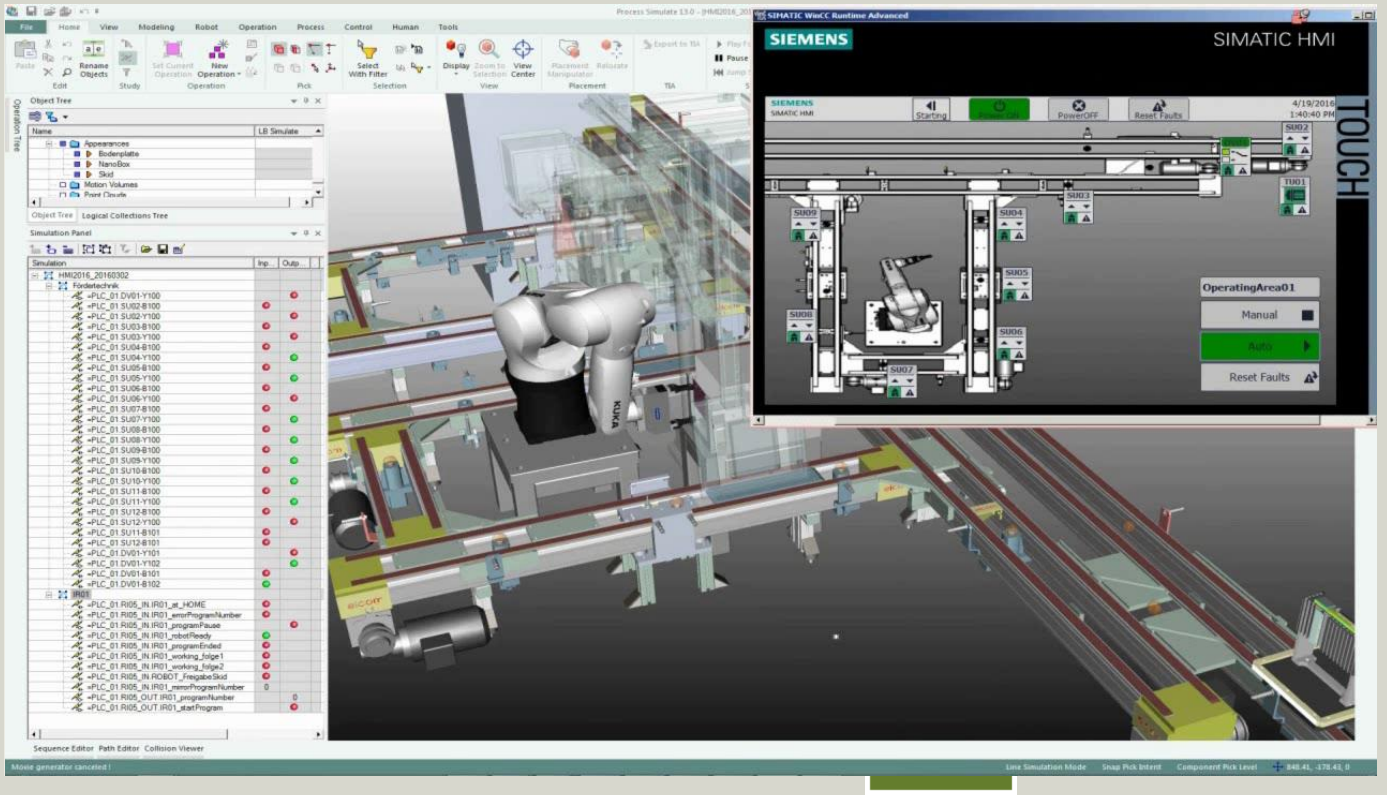
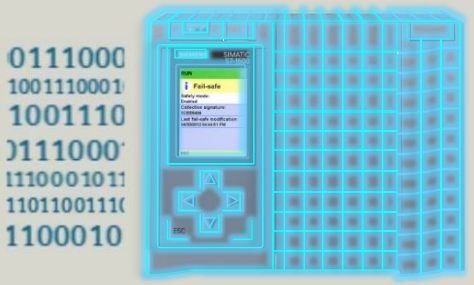
Mechatronics Engineering and Virtual Commissioning

1 Product design | 2 Production planning | 3 Production engineering | 4 Production execution | 5 Services





Digital Twin of SIMATIC S7-1500

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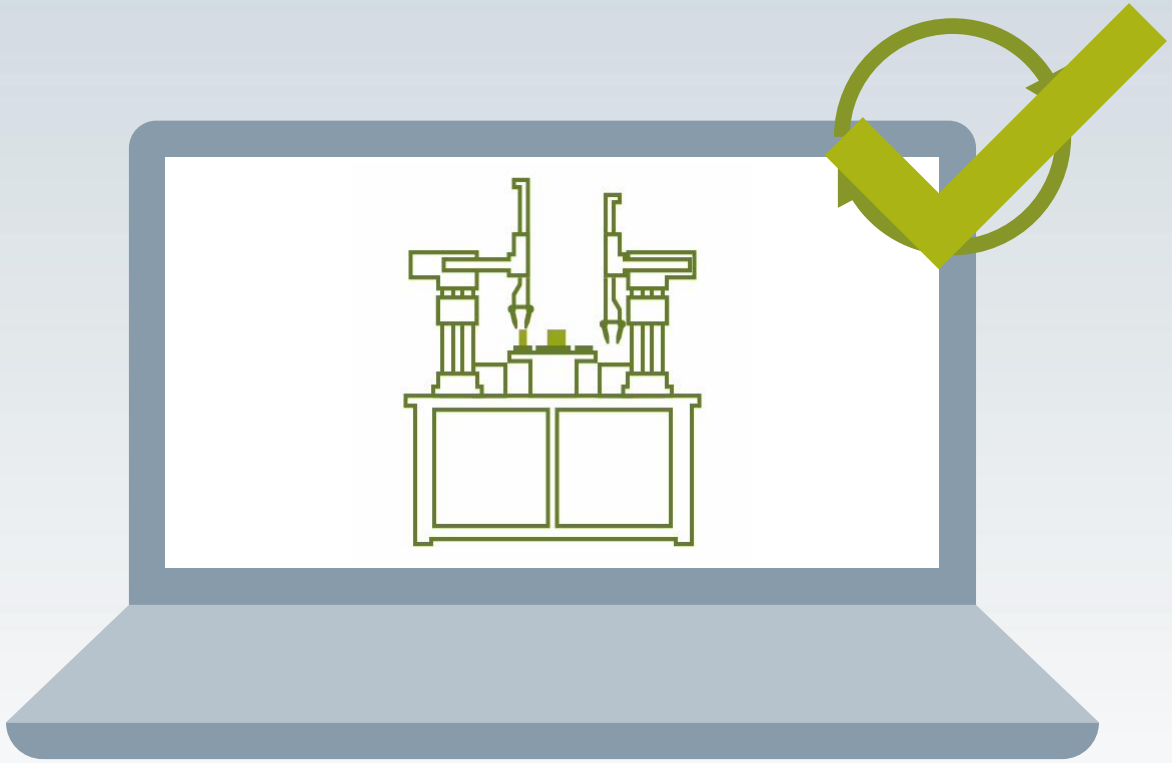
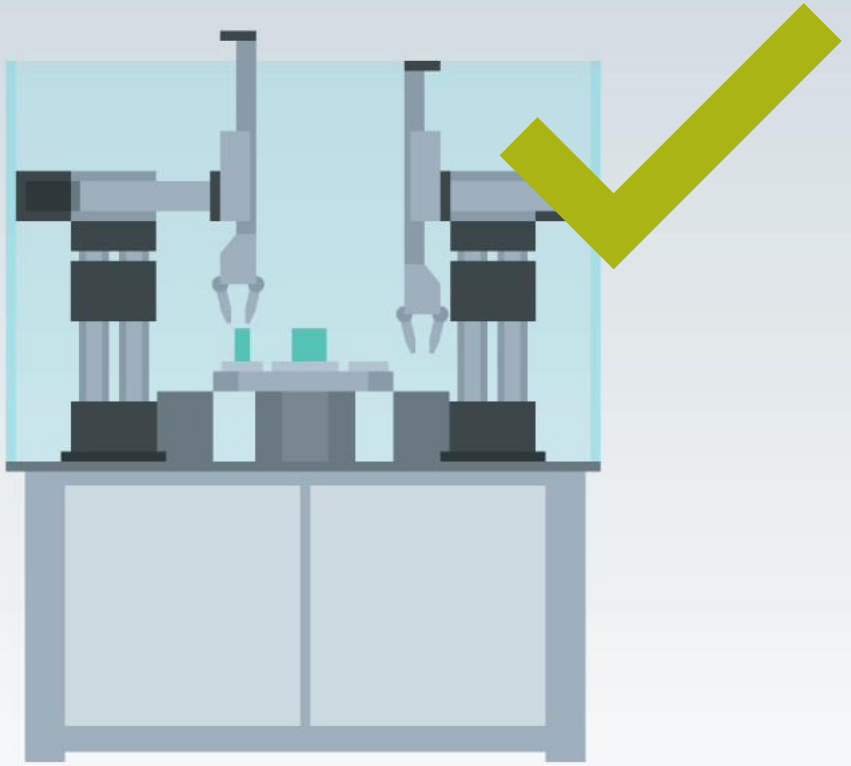
Digital twin of the machine for simulation, testing and virtual commissioning



Virtual



Real

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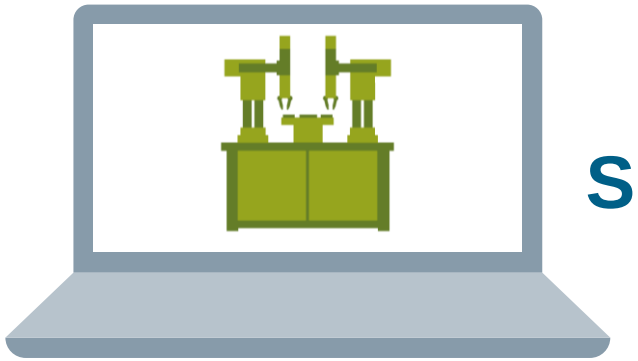
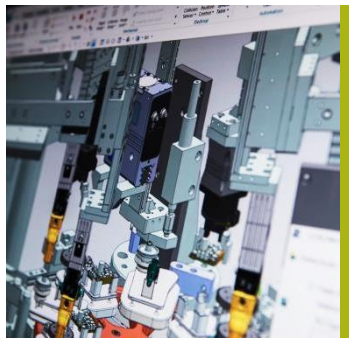
Integration of PLM and TIA:
Merging mechanical and automation engineering



Software in-the-loop

Mechanical model

Automation



NX Mechatronics Concept Designer

PLCSIM Advanced

Totally Integrated Automation Portal

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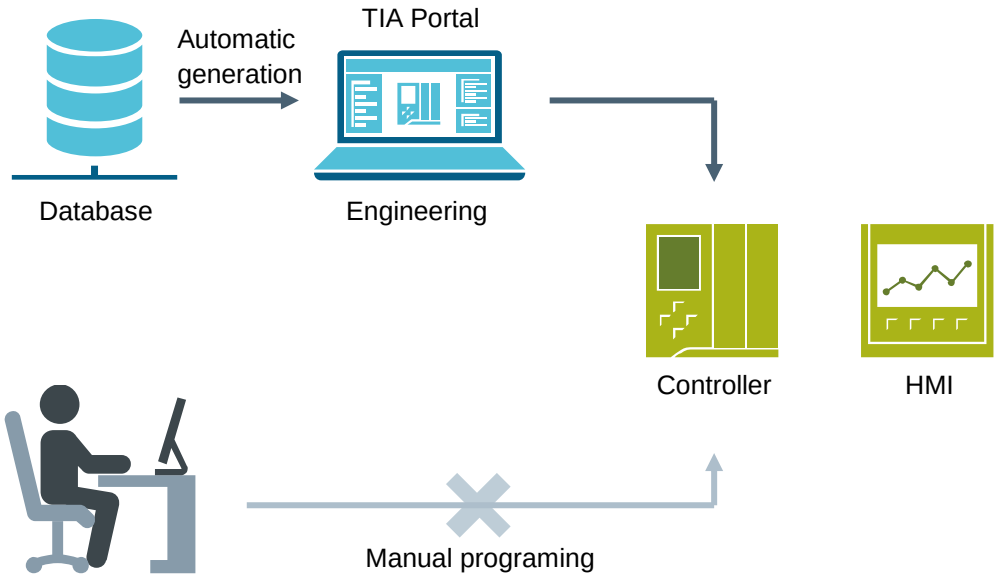
Automatic generation of PLC code and HMI screens

User scenario

With *TIA Portal Openness*

- Easily generate automation programs for serial machine builder by using information from upstream processes
- Exchange data with upstream engineering processes in TIA Portal



- More **efficiency** by a faster execution of the task
- **Less errors** by automation of constant processes

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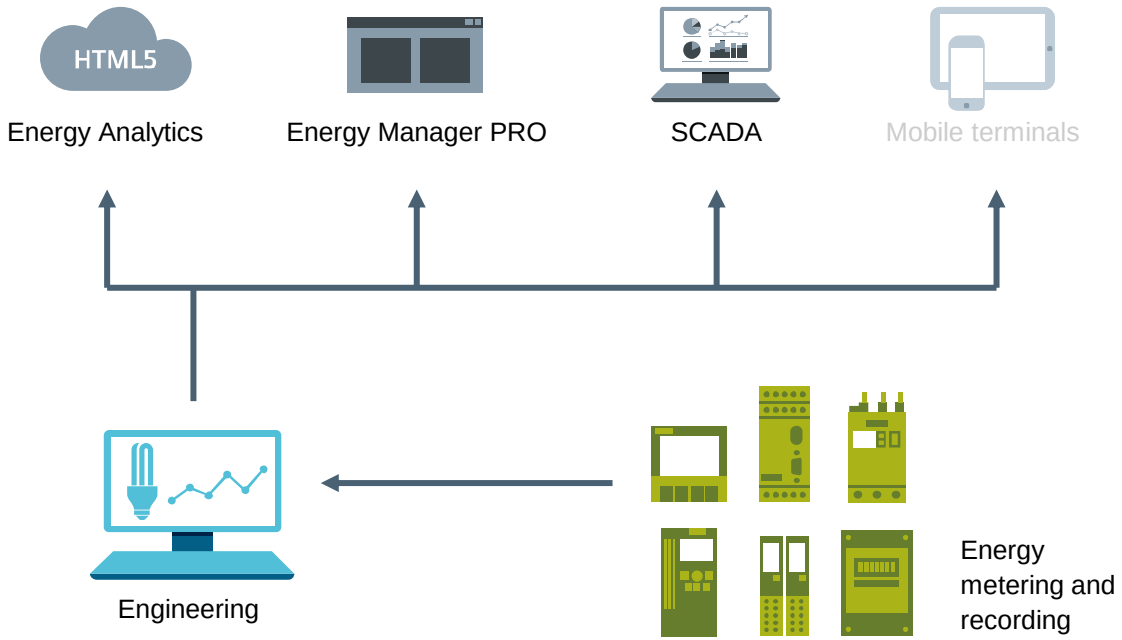
5 Easy acquiring and visualizing energy consumption data



TIA Portal with *SIMATIC Energy Suite*

- Intelligent linking of energy and production data
- Automatic generation of energy management program
- Seamless connection to the energy management system

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With Siemens' integrated technologies, Maserati was able to reduce development time considerably while increasing production output

Reducing the time to market

30% shorter development time

Close integration of suppliers

Enhancing flexibility

Ghibli available in

70,000

combinations

Increasing efficiency

3 times

more cars produced than before

Integration of two new assembly lines into existing factory

1 Product design	2 Production planning	3 Production engineering	4 Production execution	5 Services
NX CAD NX CAE LMS CD-adapco Star-CCM+ Teamcenter	Tecnomatix Teamcenter	SIMATIC	SIMATIC SIMATIC IT SINUMERIK SCALANCE SITOP SIRIUS	Uptime and sparepart services

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Siemens Amberg plant

Fast! **~1 Million** monthly production of SIMATIC products

Flexible! **1200+** Teamcenter managed products shipped to **60,000+** customers worldwide each year

24 hour lead time for new orders

Efficient **75% OEE** plus **20% buffer** for overcapacity

Quality! **~11 dpm** means near perfect quality – every time

Overview of Siemens Digitalization

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Digitalization In Process Industries

Services

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From Integrated Engineering to Integrated Operations

- Lifecycle plant management with a holistic tool landscape
- Common data model for a shorter time-to-market
- Increased efficiency through simulation
- Optimized operations based on high plant and process transparency with a digital twin

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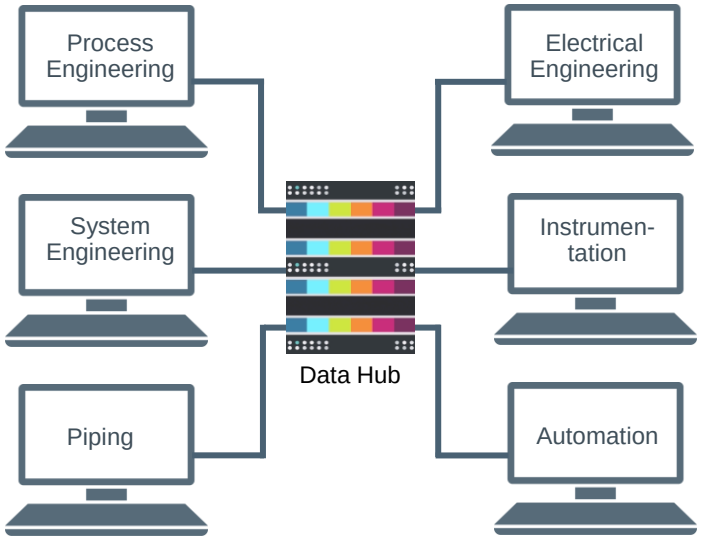
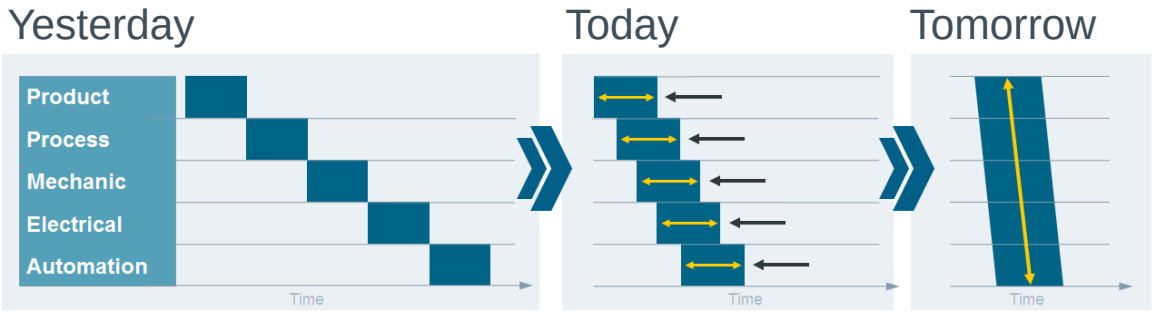
Integrated Engineering for process plants: Common data model ensures consistency for all workflows along the lifecycle

One data hub that completely integrates all disciplines into a globally consistent database …



… and workflows can be executed in parallel, which saves valuable time and thus reduces costs



1 Product design | 2 Process & plant design | 3 Engineering & commissioning | 4 Operation | 5 Service

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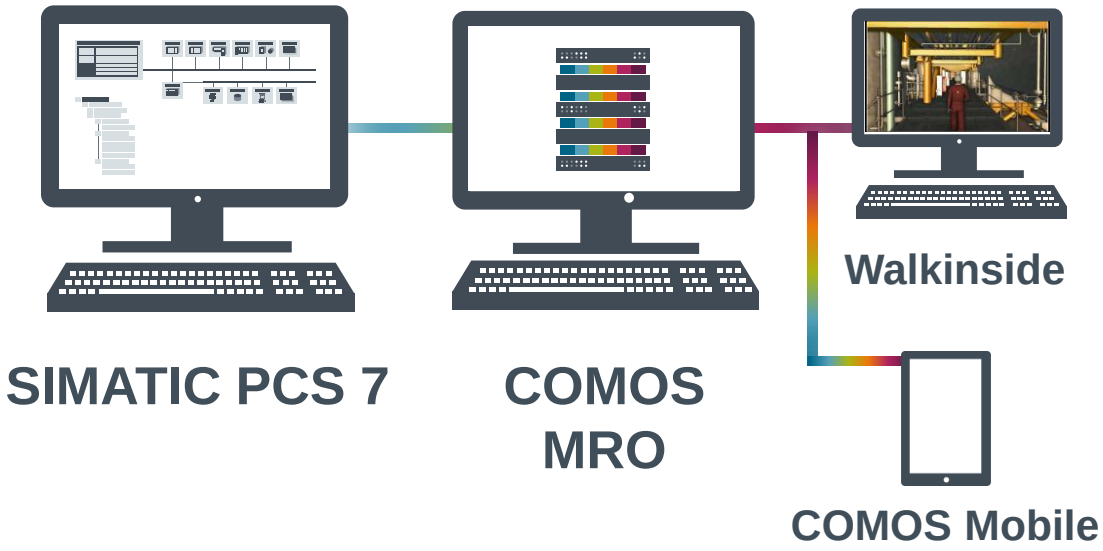
Integrated Operations:
Optimized workflow for maintenance management



Your benefits in Maintenance

- ✓ Time saving by direct and easy communication between operator and service personnel
- ✓ Asset location and necessary documentation available via COMOS and COMOS Walkinside
- ✓ All information also available on site
- ✓ Direct feedback about maintenance execution
- ✓ Plant documentation immediately updated

1 Product design | 2 Process & plant design | 3 Engineering & commissioning | 4 Operation | 5 Service

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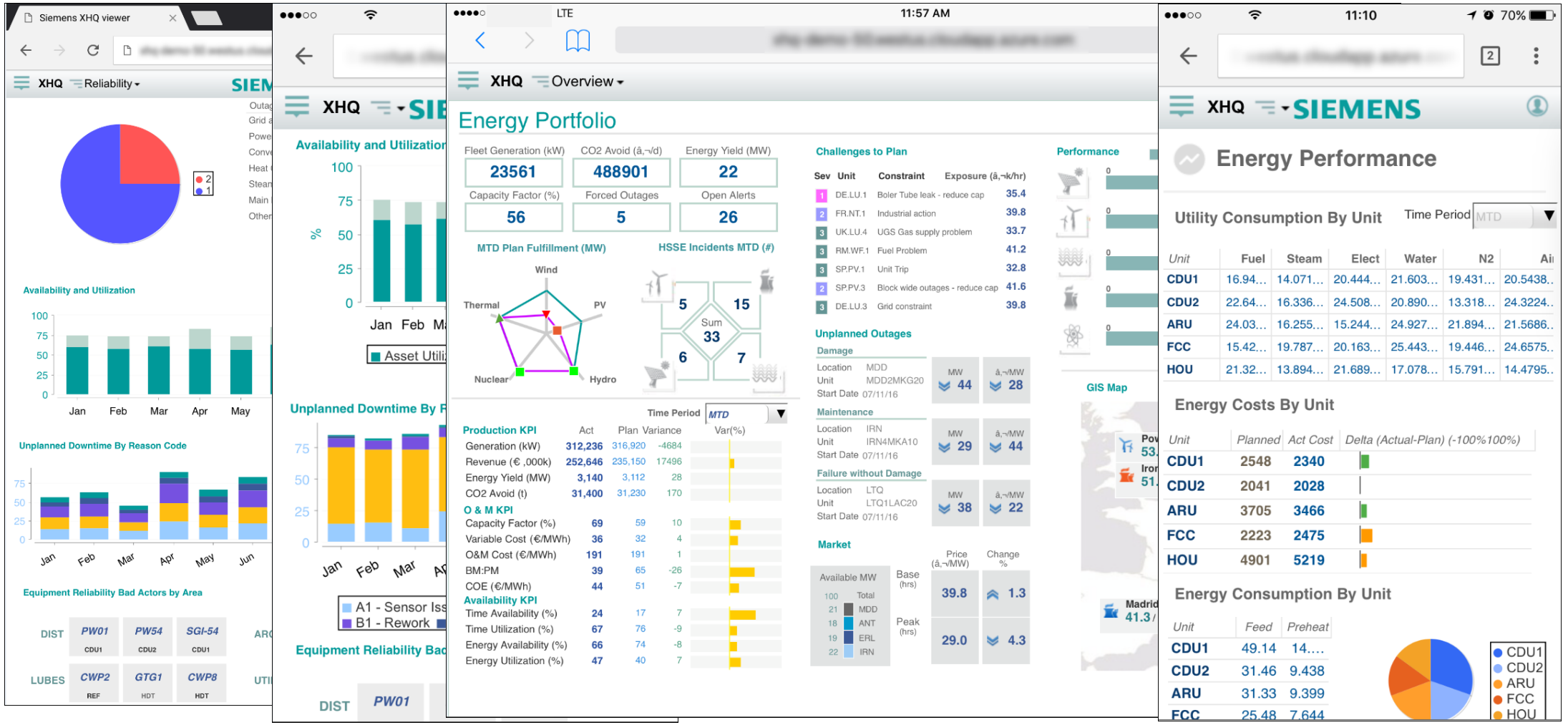
Management Dashboard – XHQ runs on iOS, Android



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Twin plants from one plan: Efficiency through cloning – BASF, China and Brazil

Simultaneous engineering of two plants for superabsorbent polymers in China and Brazil (cloning)

- Immediate learning effects support optimization of the system design and engineering processes
- The synergy effects exceeded all expectations
- Additional benefits that extend beyond the engineering and design phase

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- Overview of Siemens Digitalization
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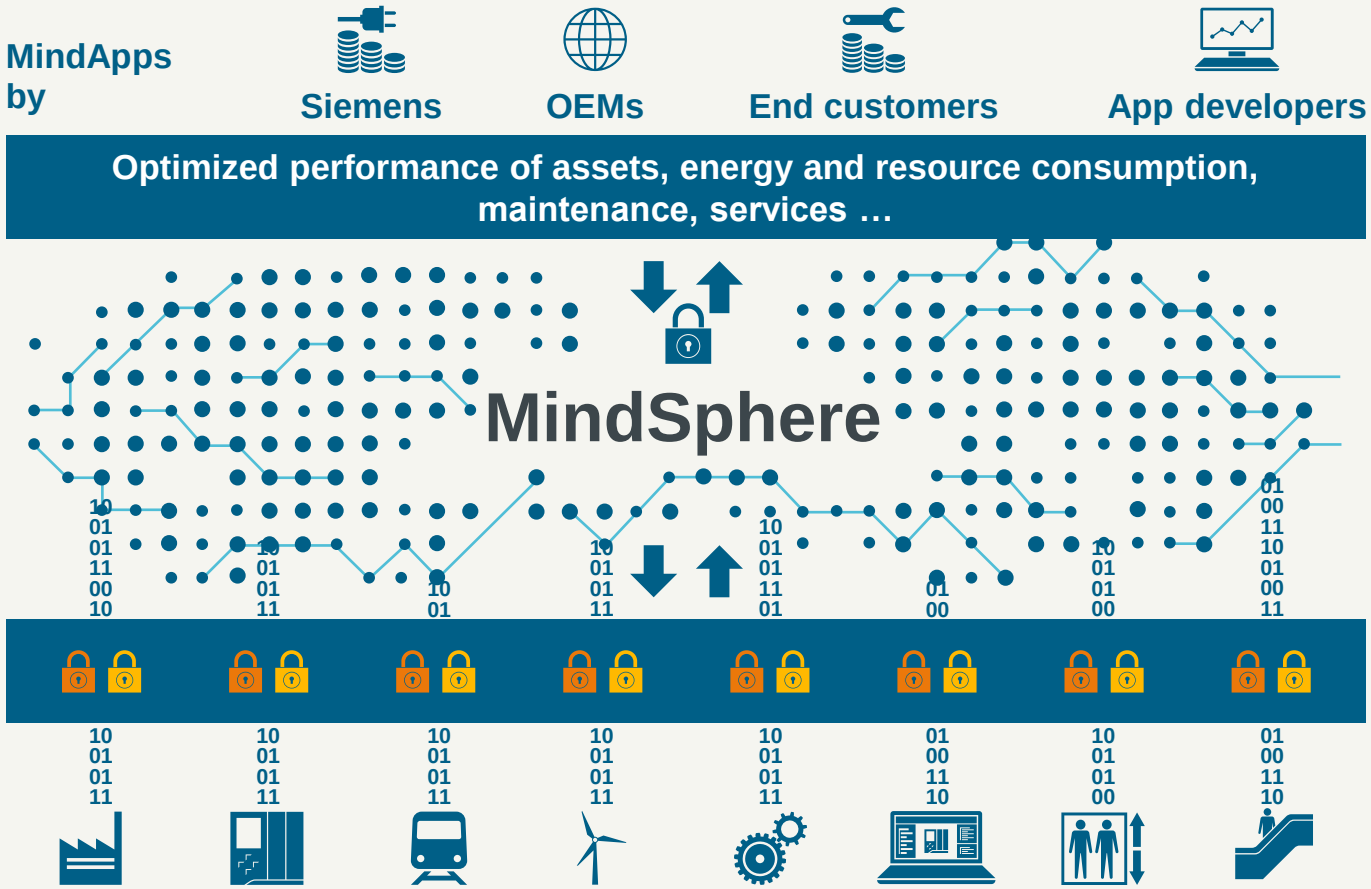
MindSphere –
The cloud-based, open Internet of Things operating system



MindApps

- Asset transparency and analytical insights, e.g. predictive maintenance
- Subscription based pricing model
- Fleet management

MindSphere

- Open interface for development of customer specific apps (MindApps)
- Various cloud infrastructures: Public, private or on-premise

MindConnect

- Open standards (e.g. OPC UA) for connectivity (also to 3rd party products)
- Plug and play connection of Siemens products

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Summary: Steps for Implementing successful Digitalization

Identify pain-point

Convince your stakeholder

Evaluate which comes first

Roi evaluation

Plan road Map

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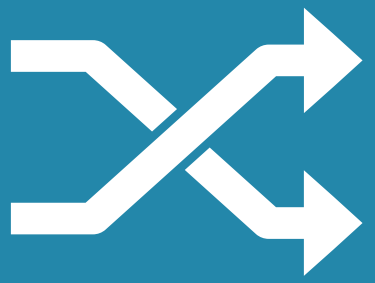
Focus on

Speed

Flexibility



Quality

Efficiency

Security

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Thanks You

Goh Siew Boon

Digital Factory /Factory Automation

Assistant Vice President

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