Overview

• Why Change?
  • To accommodate the demanding he need to move into the digital enterprise.

• Why Now?
  • Delay will reduce competiveness and profits.

• Why Siemens Automotive?
  • Siemens and our Automotive Group can guide you to success in for your automation projects.
How effectively is your company dealing with the current and future industry challenges?

Key challenges in Automotive today
- Changing Global Consumer
- Increased Productivity
- Getting to market faster
- Generational Workforce Transition
- Digital Transformation
How prepared are you to change your business?

The products, business models and legacy positions that once gave companies their competitive edge are no longer secure. Change is necessary!
Leveraging data to fuel innovation is important, but...

Even if you knew what you needed to do, could you do it efficiently, flexibly and fast?
Why Change?
Challenges for the industry are growing worldwide

Siemens has the answers to the challenges of our customers in the manufacturing industry.

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

- Individualized mass production
- Volatile markets
- High productivity

- Resource, Production and Energy efficiencies are key competitive factors

Strengthening our customers’ competitiveness

Reducing the time to market

Enhancing flexibility

Increasing efficiency
Manufacturing is moving into the age of digitalization

1st Industrial Revolution
- Water and steam

2nd Industrial Revolution
- Electricity, mass production
- Automation

3rd Industrial Revolution

4th Industrial Revolution
- Digitalization

Digitalization Complexity Elements
- Big Data and analytics
- Augmented reality
- Additive manufacturing, e.g. 3D printing
- Simulation
- Cloud
- Cyber security
- Industrial Internet (network of hardware-integrated sensors)
- Autonomous robots
- Horizontal/vertical software integration

Sources: BITKOM, BCG
Roadmap towards Industry 4.0: Evolution, not Revolution!

- Introduction of electronics and IT to further automate production
- Integration and optimization of the entire product development process
- Self-optimization of Cyber-Physical Systems (CPS)

Path to Industry 4.0

1960  2010  2030  today

Industry 4.0
The Future of Manufacturing with Industry 4.0

- Faster time-to-market to master short product lifecycles
- Improve operational excellence to increase productivity
Digitalization shrinks time to market and improves quality

- Seamless integration of product and production intelligence
- Shared data stores and models
- Collaborative closed feedback loop
Cyber-Physical Systems
Digital Twin contains all the information from virtual to real

The Digital Twin contains all the information through:
- Software
- Mechanics
- Electrical
- Automation, HMI
- Safety, Security
- Maintenance
- Location, Identity
- Status
- SW Versions
- Interfaces
- ...

The digital model is always up-to-date and is extended over the entire lifecycle

| Product design | Production planning | Production engineering | Production execution | Services |
The Evolution continues in Industry 4.0
Intelligent production based on Cyber-Physical Systems

“Smart” products

• The product to be manufactured has all the necessary information for every step of its production.

Autonomous production facilities

• Self-organization of networked production facilities taking into account the entire value chain.
• Production steps are configured flexibly in response to changing situations.

Reduction of complexity resulting from “smarter” structures
Why Now?
We are living in an age of transformative technologies

The basic building blocks of the Industrial revolution are combining for exponential progress.
The Future of Manufacturing
Profit Model

[Diagram showing the life cycle of a product with stages: Early Production, Growth, Maturity, Decline, and End of Life. Key points include:
- **EARLY PRODUCTION**: Speed to Market
- **GROWTH**: Increase Revenue
- **MATURITY**: Production Peak
- **DECLINE**: Break Even
- **END OF LIFE**: Phase Out

Strategic actions:
- **Profit**: Minimize
- **Speed to Market**: Increase
- **Reduce Cost**: Minimize
- **Extend Returns**: Increase

Financial highlights:
- Increase Revenue
- Minimize Costs
- Boost Productivity
- Launch
The Siemens Approach to the Future of Manufacturing

Only a holistic automation approach including the whole value chain will yield sustainable competitiveness.
The Siemens Future for Manufacturing

Step 1: Faster development of product design through Siemens PLM software
The Future of Manufacturing
Step 1: Faster development of product design through Siemens PLM software

Landing on Mars is one of the hardest jobs on Earth.

On August 5, the Mars rover Curiosity landed successfully on the surface of Mars. There was only one chance to get it right. For this unprecedented challenge, NASA employed Siemens PLM software solutions. The development team at NASA’s Jet Propulsion Laboratory digitally designed, tested, assembled, and simulated the entire Mars rover before a single physical prototype was created.
The Future of Manufacturing
Step 2: Simulation of production planning reduces time to market

Faster Time to Market
Moving from serially phased silos to simultaneous collaborative engineering, improves planning schedules and production start.
The Future of Manufacturing
Step 2: Simulation of production planning reduces time to market

Collaborative closed loop feedback
Digital design platform reduces individual physical collaboration requirements, between teams, to identify design flaws and allow for a faster production cycle.
The Future of Manufacturing
Step 3: Cost savings through the highest efficiency in automation engineering

TIA Portal is the key to unlocking efficiency
TIA minimizes time and costs through data consolidation, bringing the virtual world to the real world.
The Future of Manufacturing

Step 3: Cost savings through the highest efficiency in automation engineering

TIA Portal is the key to unlocking efficiency
TIA minimizes time and costs through engineering efficiencies and increased access to data.

Long-term development of automation costs

- Total costs
- Engineering cost/hour
- Automation complexity (time)

Legend:
- Pink: Cost of engineering
- Blue: Complexity of automation
- Dotted line: Total automation costs
- Turquoise: Engineering Efficiency
The Future of Manufacturing
Step 3: Cost savings through the highest efficiency in automation engineering

TIA Portal is the key to unlocking efficiency
TIA minimizes time and costs through integrated diagnostics, common data management, safety and security.

One common framework
Unique and consistent user interface concept
Common and centralized services
The Future of Manufacturing
Step 3: Cost savings through the highest efficiency in automation engineering

TIA Portal is the key to unlocking efficiency
TIA minimizes time and costs through improved engineering efficiencies.
The Future of Manufacturing
Step 3: Cost savings through the highest efficiency in automation engineering

TIA Portal is the key to unlocking efficiency
TIA minimizes time and costs through interoperability of automation components.
The Future of Manufacturing

Step 4: Efficient production based on high performance technology

Minimize your downtime
Integrated system diagnostics and commissioning tools help you quickly diagnose issues so you’re quickly back up and running
The Future of Manufacturing
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1. Product Design
2. Production Planning
3. Production Engineering
4. Production Execution
5. Services

The Future of Manufacturing
Step 4: Efficient production based on high performance technology
The Future of Manufacturing

Step 5: Services throughout the lifecycle are built upon the previous step’s data

Data Transforms Production Maintenance
Maintenance teams have to now add iPads and laptops to their toolbox.
The Future of Manufacturing
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Defense in Depth
Solve the challenge of big data, the Siemens Industrial Security Concept: Assess, Implement, Manage

- Know-how protection
- Authentication management
- Firewall & VPN
The Future of Manufacturing
Step 5: Services throughout the lifecycle are built upon the previous step’s data

Siemens Standard Support Services
No charge single toll-free number, with live operators, technical support during normal business hours.

A workforce improvement program that is customized to your exact learning needs.

Courses include:
- Product
- Safety
- Certification learning programs

Course delivery methods:
- In-person
- Virtual instructor-led
- Digital
The Future of Manufacturing

The complete cycle
Siemens Automotive

Products, solutions, services and vertical expertise from a single source

A

Products
TIA Portfolio: PLC, HMI, SIMATIC Net, SIMATIC IT, Sirius, energy efficient drives, SINUMERIK, etc.

B

Solutions
Conveyor systems in final assembly, test rigs, automation engineering, etc.

C

Services
Business based Maintenance, Energy efficiency consulting, etc.

D

Verticals
Automation concepts for powertrain, assembly, body, paint, tier 1, machine builders.
Siemens Automotive
Our approach

Planning
- Development of standards
  - Architectures and Components
  - Functional Definition & Design
- Migration
  - Optimize installed base
  - Digitalization

Realize
- Pilot installations
- Engineering Value Add
  - Validation
- Production Efficiency
  - In Plant Service
  - Support operation uptime

Modernize
- Siemens Automotive Group

Operate
- Siemens Automotive Group

Our approach:
- Planning
- Realize
- Modernize
- Operate
Siemens Automotive
World-wide setup to support our customers wherever they go to

Siemens Automotive represented in 20 countries
Covering over 1,500 plants globally
In every project phase, the Automotive Team supports the end users and machine builders.
A future-focused, totally integrated approach

Siemens is your Automotive Solution

<table>
<thead>
<tr>
<th>BENEFIT</th>
<th>RESULT</th>
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</thead>
<tbody>
<tr>
<td>Improved engineering efficiency</td>
<td>Lower design costs</td>
</tr>
<tr>
<td>Integrated diagnostic functions</td>
<td>Minimized downtime</td>
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<tr>
<td>Integrated communication tools</td>
<td>Production flexibility</td>
</tr>
<tr>
<td>Integrated security functions</td>
<td>Lower plant and network risk</td>
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<tr>
<td>Technologies that protect personnel, machinery and the environment</td>
<td>Improved safety</td>
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<tr>
<td>Single, streamlined database</td>
<td>Optimized data quality</td>
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<td>Increased access to common data</td>
<td>Better decision making</td>
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<tr>
<td>Global standards</td>
<td>Simplified implementation of automation solutions</td>
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<tr>
<td>Interoperability of system-tested components</td>
<td>Improved overall performance</td>
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Industry 4.0 with the Siemens TIA approach optimizes the entire manufacturing process, leading to increased ROI.
Thank you for your attention!

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Enjoy the rest of Manufacturing in America 2016
**Every portfolio segment of solution business has a clear ownership to drive innovation and cover project responsibility**

<table>
<thead>
<tr>
<th>Segment</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>General contracting</td>
<td>Global professional project management of turnkey projects comprising planning, engineering and commissioning</td>
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<tr>
<td>Conveyor systems</td>
<td>Heavy EMS, Light EMS, EMS Driver, Skillet-, roller bed and slat-/belt conveyors and special conveyors for bodyshop</td>
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<tr>
<td>Assembly systems</td>
<td>Assembly fixtures, frames and systems e.g. for frontend, cockpit, marriage</td>
</tr>
<tr>
<td>Automation engineering</td>
<td>Automation solutions for Body shop, Paint shop and Assembly shop;</td>
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<tr>
<td>EOL – Test and diagnostics</td>
<td>Testing technology for the check of car electronic and rigs for roller test and wheel alignment</td>
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<tr>
<td>Industry logistics</td>
<td>Turnkey solutions for pallet, tote and customized warehouses</td>
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