Siemens Industry drives the next generation of manufacturing

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November 27, 2012
SPS IPC Drives
Nuremberg, Germany
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Cohesive support for the product creation process using software tools enhances the speed, productivity and quality of industrial innovation processes.

Siemens supports the entire industrial value creation process with software tools.
The theme of this presentation is the expansion of our offering along the entire product development and production process.

Siemens supports the entire industrial value creation process with software tools.

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

Acquisition of LMS International
Launch of SIMATIC S7-1500
TIA Portal incl. SINAMICS Startdrive
Drive Technologies innovations

Intelligent networking

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Industrial software is the key to competitive industrial product creation processes and to interesting perspectives for growth.

The market for industrial software is growing about 8 percent a year.
By acquiring UGS, Siemens has set itself the challenge of merging virtual and real lifecycles in the product and production worlds through the medium of software.
Simulation is the digital technology with the greatest productivity potential within the product creation process - Example: Consumer electronics

1) Considered Data types: Image Data, ASIC, CAD, PDM, Animation Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Physical (real) Function Prototype</th>
<th>Physical (real) Product Prototype</th>
<th>Physical (real) Production Prototype</th>
<th>Physical (real) Mass Production Prototype</th>
<th>Production Check</th>
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<tr>
<td>2002</td>
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<td></td>
<td></td>
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<tr>
<td>2008</td>
<td>Virtual (digital) Function Simulation Prototype</td>
<td>Virtual (digital) Product Simulation Prototype</td>
<td>Production Check</td>
<td>- 40%</td>
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</table>

Simulated prototypes reduce costs and time without compromising product quality

Product Data in TeraByte (TB) 1)

<table>
<thead>
<tr>
<th>Year</th>
<th>Data</th>
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<tr>
<td>2002</td>
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<td>2005</td>
<td>28.0</td>
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<td>2008</td>
<td>296.0</td>
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</table>

1) Considered Data types: Image Data, ASIC, CAD, PDM, Animation Data
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LMS boosts the Siemens portfolio in the field of mechatronic system simulation and model verification

**Portfolio overview**

| LMS Virtual.Lab and LMS Samtech | 3D Performance Simulation  
3D Structural Analysis |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
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</table>

| LMS Imagine.Lab – Mechatronic System Simulation | System Synthesis  
Multi-physics Modeling |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
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</tbody>
</table>

| LMS Test.Lab – Test Based Engineering | Laboratory Testing  
Mobile Testing  
LMS SCADAS |
<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
</tbody>
</table>
LMS International:
Leading PLM provider for the simulation and verification of mechatronic systems

**Company profile**
- Founded in 1980, Headquarters in Leuven (Belgium)
- Employees in 40+ offices worldwide with more than 1,200 professionals
- EUR 140 million sales in Q1-Q3 of 2012

**Revenues**
- 2010
- 2011
- 2012

+25% CAGR

**Market coverage**

**Endmarket penetration**
- Aerospace 20%
- Automotive 55%
- Energy and others 25%
- Automotive 23%
- Energy and others 40%
- USA 37%
- Europe 40%
- Asia 23%

- LMS is partner to some 5,000 companies in automotive, aerospace and other industries
- Strong emphasis on innovation with ca. 25% of budget in R&D

LMS has a strong growth track record and covers the leading industries
Strategically sound selection of targets and circumspect integration will secure the success of our exogenic growth plan. Total investment since 2007 over 4 bn EUR.

**Date of announcement:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Country</th>
<th>Product/Service</th>
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<tbody>
<tr>
<td>2007</td>
<td></td>
<td>USA</td>
<td>PLM software</td>
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<td>2009</td>
<td>September</td>
<td>Germany</td>
<td>MES software</td>
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<tr>
<td></td>
<td>November</td>
<td>USA</td>
<td>CAD design software</td>
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<td></td>
<td>January</td>
<td>USA</td>
<td>Industrial communications and network solutions</td>
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<tr>
<td></td>
<td>February</td>
<td>Canada</td>
<td>Industrial quality and production management</td>
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<tr>
<td></td>
<td>September</td>
<td>Germany</td>
<td>Product cost management software</td>
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<tr>
<td></td>
<td>October</td>
<td>France</td>
<td>Computer-aided motion software</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>Belgium</td>
<td>Systems Test and Simulation</td>
</tr>
</tbody>
</table>

- **PLM software**: Software for discrete industries
- **MES software**: Integrated plant management
- **CAD design software**: Pharmaceutical and biotech industries
- **Industrial communications and network solutions**: Production of composite materials
- **Industrial quality and production management**: Across vertical market lines
- **Product cost management software**: Across vertical market lines
- **Computer-aided motion software**: Software
- **Systems Test and Simulation**: Software

**Countries and Dates:**
- **Germany**: September 2009, January 2012
- **Brazil**: USA
- **Canada**: Germany
- **France**: Belgium
- **Belgium**: September 2011, October 2012, November 2012
Paradigm shift allows next level of productivity: Integrated product and production lifecycles

"These initiatives deserve the same long-term investments that manufacturers made in ERP for transaction processing."

Gartner, July 2009
TIA Portal
One (1) engineering tool for the whole range of automation tasks

- Standardized operating concept
- Automatic data consistency
- Intuitive – efficient – future-proof
TIA Portal Feedback
Positive from all over the world

“…the speed and high-performance functions of TIA Portal software have created an enormous benefit”

New Baima Mining LLC (China)

“…time savings of around 20-25% in project creation”

Breton (Italy)

“…an integral system, resulting in substantially higher efficiency and minimal downtimes”

REINHOLZ Software & Technology GmbH (Germany)

“…we achieve time savings of at least 50% in Engineering”

Crawford Technical Systems (USA)
# SIMATIC
## Innovation of modular controller

<table>
<thead>
<tr>
<th>Year</th>
<th>Advanced</th>
<th>Basic</th>
<th>Micro</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>SIMATIC S7-400</td>
<td>SIMATIC S7-300</td>
<td>SIMATIC S7-200</td>
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<tr>
<td>2012</td>
<td>SIMATIC S7-1500</td>
<td>SIMATIC S7-1200</td>
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</tbody>
</table>

- **TIA Portal**
- **SIMATIC S7-400**
- **SIMATIC S7-1500**
- **SIMATIC S7-300**
- **SIMATIC S7-1200**

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TIA Portal and SIMATIC S7-1500
The ultimate boost to power and efficiency
Protection of intellectual property and investment
Protection against unauthorized duplication of executable programs
Advanced protection against unauthorized project engineering changes
Protection against unauthorized manipulation for greater plant availability
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Three dimensions of integration for higher productivity and efficiency

**Horizontal**
- Reliable system of seamless and compact integrated components
- Guaranteed performance and productivity
- Guaranteed efficiency for the entire drive train

**Vertical**
- Seamless integration into automation system
- Optimized utilization and control of the machinery
- Maximum productivity, best efficiency

**Life Cycle**
- Fast development process, fast at the market
- Easy commissioning by “Virtual machine”
- Guaranteed process safety and performance

**SINAMICS V20**
The compact and robust inverter for basic applications

**SINAMICS Startdrive V12**
Integration in das TIA-Portal: Effiziente Inbetriebnahme und Projektierung von SINAMICS-Antrieben

**Virtual NC**
Easy commissioning by “Virtual machine”
SINAMICS V20
Introducing a new member of the integrated drive system portfolio

**SINAMICS V20**
The cost-effective, reliable and easy-to-use inverter for basic applications

- Compact and robust
- Four sizes to cover the performance range from 0.12 to 15 kW
- Energy-optimized control mode (ECO Mode)

**Applications**
- Pumping, ventilating, compressing
- Moving
- Processing
Efficient with high usability
- Usage of TIA Portal functions for drives
- Easy parameterization with graphical masks and user oriented interface
- Easy integration of SIMOTICS motors
- Integrated unit conversion and safety functionality

Perfect interplay between PLC and drives
- One database, no multiple entries necessary
- PROFINet, PROFIdrive inclusive
- One application engineering with STEP 7 motion control

Motion never was that easy:
Reduced engineering and trainings effort, fewer programming errors
SINAMICS Engineering within TIA Portal
For measurable customer benefit

SINAMICS StartDrive
Easy integration of drives

"In terms of engineering time, we're saving some 30% to 40%.”

Jimmy Bruner
Control Systems Manager, Hurst Boiler and Welding
Coolidge, GA, USA

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## Benefits for our customer´s value chain across all life cycle phases

| Customer        | Vattenfall Europe Mining AG  
|                 | (Reichwalde Lausitz – Germany) |
| Order           | Construction of a 13.5 km long belt conveyor system with a coal output capacity of 6,000 t/h |
| Solution        | - Complete engineering, manufacture, delivery and assembly of the drive stations and installation of the conveying system  
|                 | - Drive systems with S120 converters in six stations  
|                 | - Construction of a control center with WinCC  
|                 | - SIMATIC S7-400 controls  
| Customer benefit| - 98% availability  
|                 | - Energy savings of up to 15%  
|                 | - Maintenance cost savings of up to 15% |
Questions and Answers …
Trade fair highlights

**SIMATIC S7-1500**

New generation of controllers SIMATIC S7-1500 for the medium to upper performance range

**TIA Portal V12**

Engineering framework TIA-Portal extended for automation and drive technology
Trade fair highlights

SIMATIC WinCC V7.2

Scada software SIMATIC WinCC Scada V7.2 expanded into plant-wide information system

Embedded Industrie PC

More performance for fanless, embedded industrial PCs
Trade fair highlights

SIMATIC ET 200SP

Distributed IO SIMATIC ET 200SP extended for AS-Interface and IO-Link, as well as with a SIPLUS device version

SIMATIC ET 200MP

New distributed IO SIMATIC ET 200MP with modular and scalable station design
Trade fair highlights

SIMATIC Field PG M4:
new generation of rugged and ready-to-run industrial notebooks

Safety relays SIRIUS 3SK1
Flexible and modular range of safety relays for a faster implementation of new machines and plants or adaptation to new requirements.
Motor starter SIRIUS 3RM1

Particularly compact motor starter with integrated overload protection for smaller motors with a rating of up to 3 kW. Requires very little space in the control cabinet at just 22.5 mm wide.

Load current supplies SIMATIC PM 1507

Power supplies provide all the system components of SIMATIC S7-1500 with 24 volts.
SIMATIC Top connect

Cabling system for fast and reliable wiring of SIMATIC S7-1500 input/output modules.

SIMATIC CP 1543-1

Communication processor with industrial security features that securely connects the SIMATIC S7-1500 controller to Ethernet networks.
SIMATIC CM 1542-5

Communication module that adds a Profibus connection to SIMATIC S7-1500 controller.

SINAMICS V20

- The cost-effective, reliable and easy-to-use inverter for basic applications
- Compact and robust
- Four sizes to cover the performance range from 0.12 to 15 kW
- Focus on energy efficiency with an energy-optimized control mode (ECO Mode)
Trade fair highlights

SIMOTICS – extended portfolio

- Flameproof explosion-protected SIMOTICS XP 1MD5 motors
- Cover efficiency class IE2
- Enable pumps, fans, compressors and mixers to be operated safely and energy efficient in areas subject to explosive hazards

SINAMICS Startdrive – Integration TIA Portal

- Efficient commissioning and configuring of SINAMICS drives by using SINAMICS Startdrive.
- Clearly structured and intuitive user interface ensures simple converter parameterization
- Convenient functions such as integrated system diagnostics and trace functionality help minimizing downtimes and optimizing motion sequences
Thank you.

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