Plattform Industrie 4.0 and Siemens
Driving the digital transformation
Pasquale De Leo & Thomas Hahn, Siemens
June 2017 | Turin
Digitalization changes everything
The world is becoming more digital ...also in industrial environments – taking into consideration of the installed base, lifetime and processes

- Manual machine configuration
- Virtual commissioning

- Large power plants
- Virtual power plants

- X-ray photography
- Digital imagine and analysis

- Fixed maintenance intervals
- Predictive maintenance
Holistic view is needed!
Digitalization impacts business models, value creation processes, products

Source: ZVEI following PwC
What is a possible way to address the challenges?
Plattform Industrie 4.0 perspektive
Future projects in the Demand Area Communication of the “Forschungsunion”

Development of ten future projects in the demand areas climate/energy, security/safety, mobility, health/nourishment and communication to assure that Germany has a pole-position in solving the global challenges.

“Industrie 4.0”

Smart Factory: Manufacturing sites in Germany are guided into a new era by merging of technical processes with business processes via ICT.

“Smart Service Welt”

Using secure cloud infrastructures and provisioning of new service platforms are the basis for internet economy in Germany.

“Autonome Systeme”

Misc. Documents
Online Library
Plattform Industrie 4.0

Umsetzungsforum Industrie 4.0, Berlin, October, 2012, Plattform Industrie 4.0, HMI April 2015
CeBIT, April, 2015
Hannover April 2017
CeBIT, April, 2017

Unrestricted © Siemens AG 2017
Page 6
June 2017
Pasquale De Leo, Thomas Hahn
Plattform Industrie 4.0
The digital transformation needs a broad-based foundation

… is a project of and for society as a whole …

… which requires close cooperation among the private sector, academia, politics, trade unions and associations …

… and needs to be translated into practice and be implemented right now.

The Platform Industrie 4.0 provides support for the coordinated and organized transition to the digital economy in Germany.

Source: Plattform Industrie 4.0
The Working Group
Five thematic priorities

Reference architectures, standards and norms
Chair: Kai Garrels, ABB STOTZ-KONTAKT GmbH

Research and innovation
Chair: Johannes Diemer, DXC Technology

Security of networked systems
Chair: Michael Jochem, Robert Bosch GmbH

Legal Framework
Chair: Dr. Hans-Jürgen Schlinkert, ThyssenKrupp

Work, education and training
Chair: Konrad Klingenburg, IG Metall

Source: Plattform Industrie 4.0
Working Group
Reference architectures, standards and norms

Reference Architectural Model Industrie 4.0 (RAMI4.0) – An Introduction
Structure of the Administration Shell
Interaction Model for Industrie 4.0 Components
Network-based communication for Industrie 4.0
VDMA’s activities in the development of OPC UA Companion Specs

Source: Plattform Industrie 4.0, VDMA
Working Group
Research and Innovation

Source: Plattform Industrie 4.0
Working Group
Security of networked systems

IT-Security in Industrie 4.0
IT-Security in Industry 4.0 fields of action for operators
I4.0-Security in Education and Training
Security in the Administration Shell (yet, only available in German)
Technical Overview: Secure Identities
Technical Overview: Secure cross-company communication
Security in RAMI 4.0

Source: Plattform Industrie 4.0
The Online-Library
Access to all relevant information

Results

Expert knowledge

Available documents

The Online-Library offers a systematic access to Industrie 4.0.

Results of the Plattform Industrie 4.0 and partners are available as specifications, compendiums and documents and can be downloaded.

Expert knowledge available.

Source: Plattform Industrie 4.0

www.plattform-i40.de/i40/Navigation/EN/InPractice/Online-Library/online-library.html
Examples of applications and products
Where Industrie 4.0 is already being practiced today

>260 examples of Industrie 4.0 applications and products …

… from large and small enterprises in a wide range of different industry sectors.

Number of employees
of the enterprises

- More than 15,000 employees: 28%
- 5,000 – 15,000 employees: 29%
- 1 – 250 employees: 28%
- 250 – 5,000 employees: 15%

Source: Plattform Industrie 4.0
Examples for international cooperation
Around the globe Plattform Industrie 4.0 initiated cooperation

- **Industrial Internet Consortium (IIC)**
- **Alliance Industrie du Futur Frankreich**
- **Digitising European Industry**

**Cooperation with China**

#Digitalassieme: Industry 4.0 Plan with Italy

**Robot Revolution Initiative Japan**

Plan with Italy

Source: Plattform Industrie 4.0
Holistic approach is needed

Setup a strong triangle for Recommendations, Testing and Standardization

Initiation of cross-sector standards
Coordination of national / international standards
Strengthen the international collaborations

Source: Plattform Industrie 4.0, Labs Network Industrie 4.0, Standardization Council Industrie 4.0

Network of test centers
Practical testing
Validated input for standardization
Siemens
Digital Enterprise Suite
We address Digitalization with a holistic approach

Value creation processes
Smart factory, smart plant

Digitally enhanced products
Smart products

Business models
Smart services
Data analytic supports availability of CERN's LHC

**Challenge**

99.999991% the speed of light

The biggest detectors ever …

… 600 million collisions per sec

**Solution**

Huge supervisory system and hundreds systems controlling the production

With rule and pattern mining methods increase operating hours

Source: CERN
With Siemens’ integrated technologies, Maserati was able to reduce development time while increasing production output.

<table>
<thead>
<tr>
<th>Reducing the time to market</th>
<th>Enhancing flexibility</th>
<th>Increasing efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>30% shorter development time</td>
<td>Ghibli available in 70,000 combinations</td>
<td>3 times more cars produced than before</td>
</tr>
<tr>
<td>Close integration of suppliers</td>
<td></td>
<td>Integration of two new assembly lines into existing factory</td>
</tr>
</tbody>
</table>

1. Product design
   - NX CAD
   - NX CAE
   - LMS
   - CD-adapco Star-CCM+
   - Teamcenter

2. Production planning
   - Tecnomatix
   - Teamcenter

3. Production engineering
   - SIMATIC

4. Production execution
   - SIMATIC
   - SIMATIC IT
   - SINUMERIK
   - SCALANCE
   - SITOP
   - SIRIUS

5. Services
   - Uptime and sparepart services

---

Increasing efficiency
- Enhancing flexibility
- Reducing the time to market

Production planning: 2
Production engineering: 3
Production execution: 4
Services: 5
Product design: 1
The Operating System for the Internet of Things: MindSphere positioning inside the Digital Enterprise Suite

MindSphere

Totally Integrated Automation

Product Lifecycle Management

Manufacturing Operations Management

Teamcenter
Data-driven services based on MindSphere enable new business

MindSphere –
The cloud-based, open IoT operating system

Gain immediate insights on whole fleet as well as individual assets using own, Siemens or partner apps

Transform insights into actionable results to increase uptime and efficiency

Configure data collection as well as connectivity quickly and easily

Virtual World
Real World
MindSphere@Siemens EWN: Data available in one platform, accessible for data analytics and connected business processes

- Connection of productive machine tools to MindSphere, robotic turning center and rotor mounting station
- Machine utilization and productivity data analysis
- Direct user feedback interviews and application requirements

Benefits
+ no homegrown data acquisition solutions
+ global transparency on production KPI
+ secure collaboration platform with external experts
Thank you!
Contact:
Thomas Hahn
Siemens AG - Corporate Technology - CT RDA CES
Günther-Scharowsky-Str. 1
91058 Erlangen, Germany
Tel.: +49 9131 7-23912, Mobil: +49 172 8352610
Mail: hahn.th@siemens.com