Industrie 4.0 – A Chance for the Swiss Industry

Robert Rudolph
Member of the Board Swissmem / President Industrie 2025
Agenda

- Initiative «Industrie 2025»
- Understanding of Industrie 4.0
- Examples / Use Cases
Examples of Products

• **Machinery**
  – Machine tools, textile machinery
  – Pumps, compressors
  – Turbines
  – Packaging & filling machines

• **Precision Instruments**
  – Tools
  – Medical Instruments

• **Electronics**
  – Electrical switches and cables
  – Electrical drives
  – Control equipment & sensors

• **Metals**

• **Vehicles**
National Initiative for Industrie 4.0

- inform
- raise awareness
- network
- promote

www.industrie2025.ch
@Industrie2025
History of «Industrie 4.0»

2012
January: Working Committee «Industrie 4.0» (acatech)
April: First presentation on «Industrie 4.0» @ HMI

2013
April: Presentation of final report of WC to Chancellor Merkel @ HMI, Launch of «Zukunftsprojekt Industrie 4.0»
June: Start of Plattform Industrie 4.0, Start of working groups, lead by VDMA, BITKOM and ZVEI

2014
Industrie 4.0 is main topic @ CeBIT and HMI

2015
@ HMI BMWi (Gabriel) and BMBF (Wanka) take over leadership of Plattform Industrie 4.0

2016
VDMA-Forum Industrie 4.0: Pathway to networked production
International Activities

• Germany: Plattform Industrie 4.0
• Netherlands: Smart Industry
• Schweden: Produktion 2030
• France: Usine du Futur
• USA: Industrial Internet Consortia (IIC)
• China: 物联网 (wù lián wǎng)
• Austria: Industrie 4.0 Österreich
Digital Transition in Industry

Cheap Electronics

Miniaturisation

Applications spec. Electronics

Materials

Storage Capacities

Automatisation Electronics (3. Revolution)

Intelligent Value Chains (4. Revolution)

Wireless

Radio Identification

Broad Band Internet

Web Technologies
Basic Understanding

Optimization of **production equipment**, **processes** up to cross-company **value added chains**

Digitalization of **products**, **services** and their **Life cycles**

Users

- Increase of productivity and agility
- New business models
- Innovationen for the market (customer value)

Suppliers

Conzzeta / 23. June 2016
Opportunities for «Use Cases»
«Use Case» have a range of aspects

«Use Cases» are a combination of:

- Technologies
- Data
- Processes
- Methods / Models
- Services
- Safety / Security
- Standards
Large field of technologies

- Production Technologies
- Big Data
- Artificial Intelligence
- Labor 4.0
- Production Planning
- Sensors Actuators
- Augmented Reality
- Digital Life Cycles
- Production Control
- Visualization
- Resilient ICT
- Supply Chain
- Additive Manufacturing
- Wireless Communication
- Innovation Methodology
- (System) Simulation
- Vision Systems
- Pervasive Computing
- Digital Business
- Robotics
- ICT Security
- Identification Technologies
- ICT Architecture
- Internet of Things
- Assistence-Systems
- Digital Engineering
- Data Safety
- Digital Life Cycles

* Not complete
Use Case: Connected Factory

Prevention of deficiencies in assembly

• Unplanned situations are detected and handled by the system
• Product is guided through assembly
• Cooperation of smart automatisation with cognitive and creative skills of workers
Use Case: Market Place Application Know-how

Access to internal and external application and technology know-how allows to optimize machine tool operation in terms of quality, time and efficiency

• Application data from archive
• Cross-machine logging and evaluation of operation and condition data
• Comparison with manufacturer data
• Business model on public market places
Use Case: Condition Monitoring

Lenses are consumables in laser machine tools
• Identification of lenses
• Diagnosis system evaluates specification of lens
• Measurement/Calculation of wear buffer
• Recording history
Example: Pilot Line Bosch Rexroth

Six basic types of disc valves in 200 variants → Enhanced assistance systems
Example: Digital Engineering for Faucets
Where is the biggest benefit of Industrie 4.0?

Percentage of companies / multiple answers allowed

- Individualised Products
- Flexible Production
- Increase in Product and Service Quality
- Stronger Customer Relation
- Resource / Process Efficiency
- New Customer Value
- Increase of Productivity

82% of the respondents see one or multiple benefits in the concept Industrie 4.0.

Source: Swissmem Survey May/June 2016
### Status of Project Implementation

Percentage of companies/ multiple answers allowed

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential in own company: all respondents</td>
<td>82%</td>
</tr>
<tr>
<td>Potential in own company: SME only</td>
<td>63%</td>
</tr>
<tr>
<td>Implemented Projects</td>
<td>44%</td>
</tr>
<tr>
<td>Ongoing Projects</td>
<td>55%</td>
</tr>
<tr>
<td>Planned Projects</td>
<td>43%</td>
</tr>
</tbody>
</table>

Amongst the respondents 1‘225 projects are implemented, running or planned. Of those 718 are with SME.

Source: Swissmem Survey May/June 2016
What are the biggest obstacles?

Percentage of companies / multiple answers allowed

- Missing understanding or incomplete conception of subject
- Missing personnel resources
- Missing holistic strategy on Industrie 4.0

Source: Swissmem Survey May/June 2016
Some Thoughts on Data

• «Data is the new oil» → Transparency → Control

• Fundamental for new (digital) business models
  – Use of publicly available data
  – Models from web world probably not applicable in industry

• Interpretation of data in manufacturing context

• Modelling / Semantics

• Data rights / trade secrets / trust / personal data protection
Take the Challenge!

Watch Visionary

Conzzeta / 23. June 2016