Industry 4.0 – the future of textile manufacturing

Yves-Simon Gloy
Content

• Institut für Textiltechnik der RWTH Aachen University
• Industry 4.0
• Successful examples
• Perspectives and opportunities

Control of a weaving machine via tablet;
Reference: ITA
Content

- Institut für Textiltechnik der RWTH Aachen University
- Industry 4.0
- Successful examples
- Perspectives and opportunities

Control of a weaving machine via tablet;
Reference: ITA
The unique position of ITA

Raw materials: natural fibers, polymers, ...

Comprehensive textile process chains

Semi-finished textiles & products

Technology and competence fields

Application fields

Mobility
Building & living
Health
Energy
ICT

RWTH AACHEN UNIVERSITY
ITA – Facts and Figures

**Staff:**
- 95 Scientists
- 55 Service personnel
- 190 Graduate research assistants
- 50 Students majoring in textile technology each year

**Research and development**
- Publicity and third party funded research
- Academic and industrial education

**Development and transfer**
- Direct industrial research
- Further education

**Budget:** around 14.3 Mio. €
Institut für Textiltechnik der RWTH Aachen University

Industry 4.0

Successful examples

Perspectives and opportunities

Control of a weaving machine via tablet;
Reference: ITA
Industry 4.0

1. industrial revolution follows introduction of water- and steam powered mechanical manufacturing facilities
   - end of 19th century

2. industrial revolution follows introduction of electrically-powered mass production based on the division of labor
   - start of 20th Century

3. industrial revolution uses electronics and IT to achieve further automation of manufacturing
   - start of 1970s

4. industrial revolution Based on Cyber-Physical Systems
   - today

- 1784: First mechanical loom
- 1870: First production line
- 1969: First programmable logic controller (PLC)
Control of a weaving machine via tablet; Reference: ITA
Successful examples
Successful examples
Successful examples

Hold the yarn at the prewinder's entrance and push the buttons to insert the yarn.
Successful examples

- Winding machine
- Spinning
- Knitting machine
- Knitted Goods
- Loom
- Fabric production

Yarn Production

Fabric Production

Smart Spool

Information
Successful examples
Successful examples

• Future of Manufacturing - Autonomik 4.0

• Aim:
  – Production of highly individualized products
  – Highly flexible production infrastructure

• Consideration of
  – Basic cognitive technologies
  – Interfaces between process steps
  – Human-machine interaction
  – 3-D in industrial applications
Successful examples
Successful examples
Successful examples
Composites manufacturing

Internet of things and services

PLC
Ethernet fieldbus

Warp knitting machine
Robot
Cutter

Automatic guided vehicle

Mobile HMI
Content

- Institut für Textiltechnik der RWTH Aachen University
- Industry 4.0
- Successful examples
- Perspectives and opportunities

Control of a weaving machine via tablet;
Reference: ITA
Perspectives and opportunities
Perspectives and opportunities
Thank you for your kind attention

Adjunct Prof. Dr.-Ing. Yves-Simon Gloy

Institut für Textiltechnik (ITA) der RWTH Aachen University
Otto-Blumenthal-Str. 1, 52074 Aachen, Germany
Fon +49 (0)241 80 234 70
yves.gloy@ita.rwth-aachen.de