FUTURE TRENDS OF INDUSTRY 4.0
COGNITIVE ASSISTANCE SYSTEMS IN MANUFACTURING

Central European Cooperation for Industry 4.0, 20 September 2017

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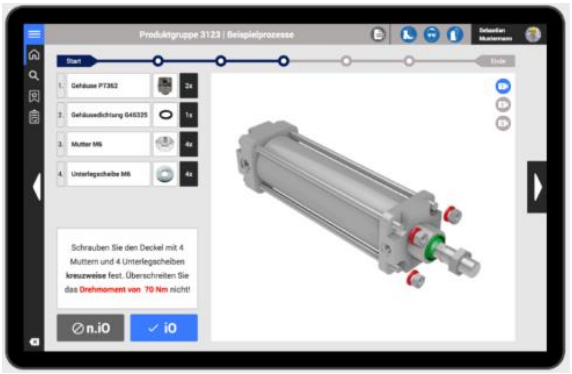
Future trends of Industry 4.0

Agenda



Economic benefits of assistance systems

Experience digitized production

Development of new technologies for assistance systems

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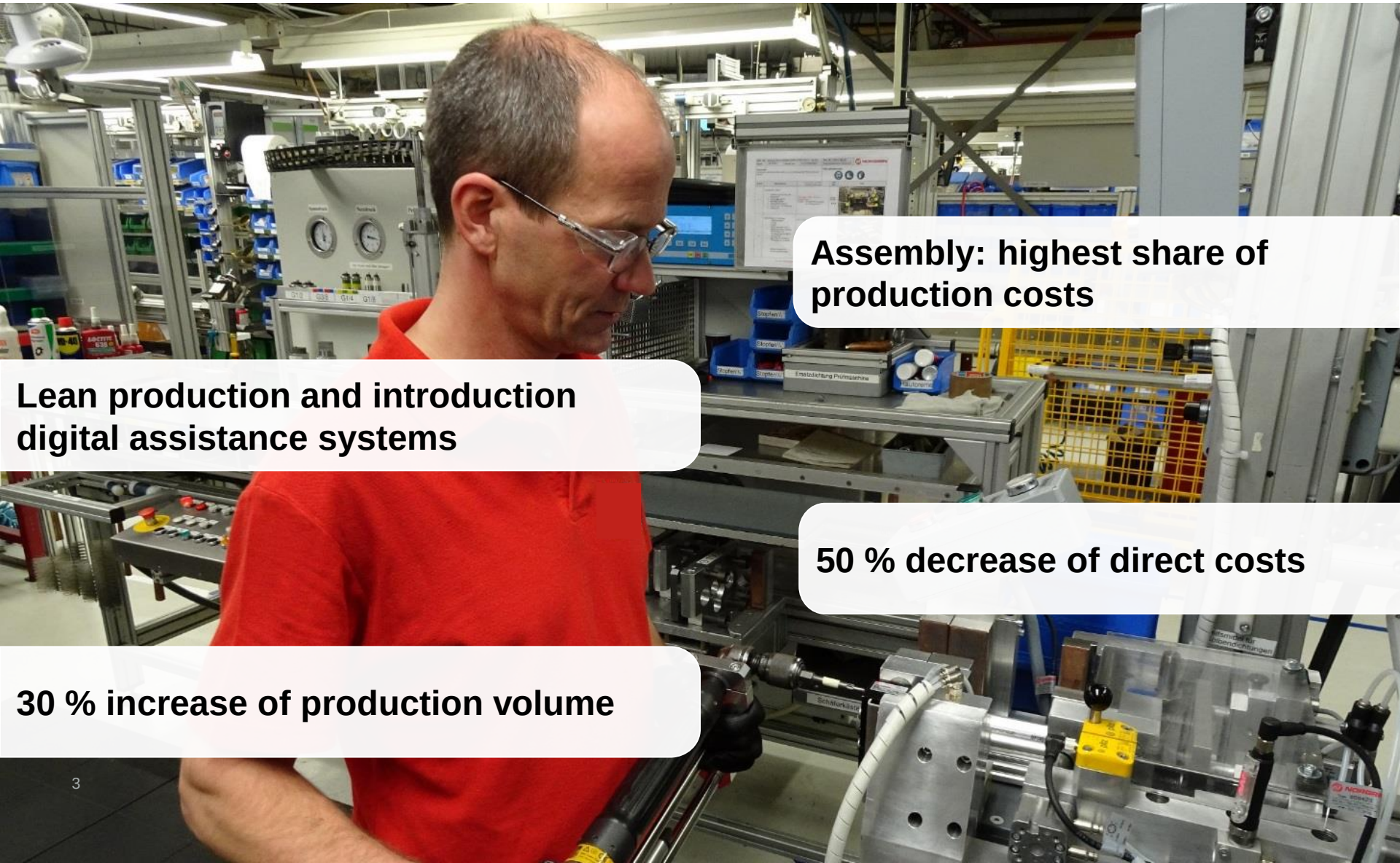
Benefits of assistance systems

Assembly of pneumatic cylinders



Assembly: highest share of production costs

Lean production and introduction digital assistance systems

50 % decrease of direct costs

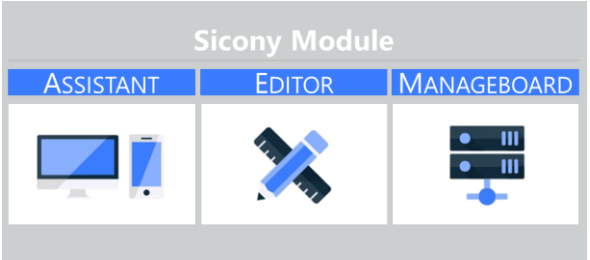
30 % increase of production volume

Benefits of assistance systems

Spin-off Sicony

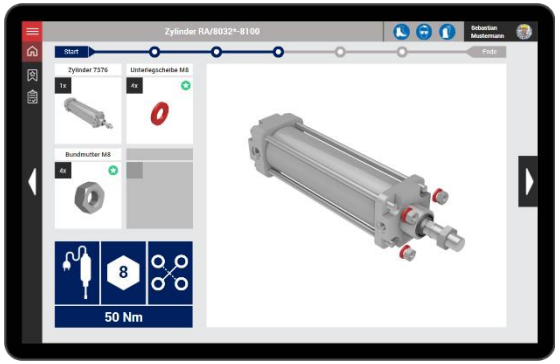
Digital worker guidance

- Comprehensive solution from creation of instructions to usage on the shopfloor
- Use of web technology
- Flexible integration



Human-centered support

- Simple creation and maintenance of work instructions
- Pictograms prevent language barriers



Picture source: Sicony GmbH

Learning factory for cyber-physical production systems

From paper-based to paperless assembly

Target group: Production managers

Learning objective: Participants experience the potentials of paperless assembly

Use case: Assembly of custom-designed remote controlled cars

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Learning factory for cyber-physical production systems

Roles and their responsibilities

Assembly worker

- Performs assembly tasks
- Responsible for quality

Production manager

- Shopfloor management
- Responsible for productivity
- External communication

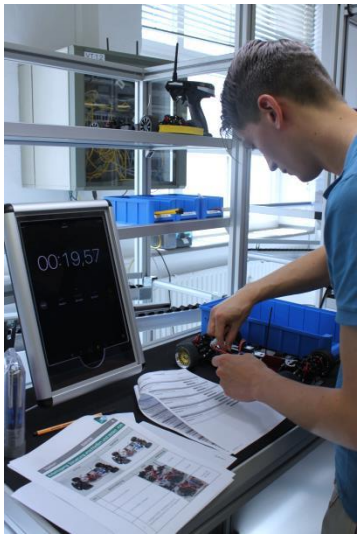
Logistics

- Responsible for material supply
- Transport between assembly stations

Learning factory for cyber-physical production systems

Three rounds with different worker support

1: Paper-based



- No digital support
- Two documents: Order sheet and general work instructions

2: Hybrid

- Barcode scans on staionary terminals for each step
- Tracking of order status

3: Paperless

- RFID-based tracking
- Use of tablets
- Order-specific assembly instructions

Image source (icons): flaticon.com

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Learning factory for cyber-physical production systems

Outcomes

Productivity: Tracking of produced cars during each 40 min. round

Acceptance: Impact of digitization on worker satisfaction

Transfer: Discussion of possible implementations

Augmented Reality Maintenance

Use Case

- Maintenance tasks of CNC-lathe
- Fast qualification of maintenance technicians and machine operators
- Main requirements
  - Hands-free
  - No specific knowledge required

Augmented Reality Maintenance

Video

Augmented Reality Maintenance

Experience with test groups

Picture source: Microsoft

- Mixed acceptance of voice and gesture control
- Necessity of feedback for user
- Further development of tracking technology needed
- Ergonomic requirements not fulfilled by current hardware

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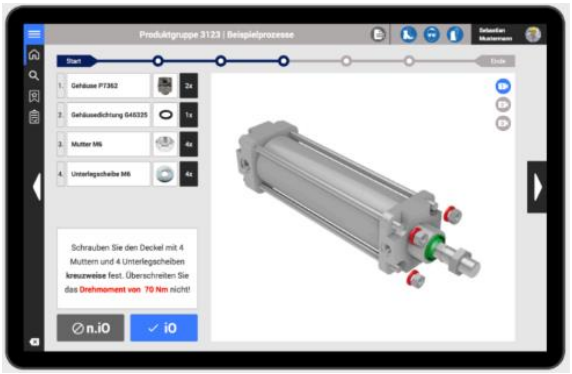
Conclusion



Market-ready industry 4.0 solutions are already available

Learning factories accelerate the transfer of new technologies

Cooperation of research and industry is needed to fulfill the right requirements

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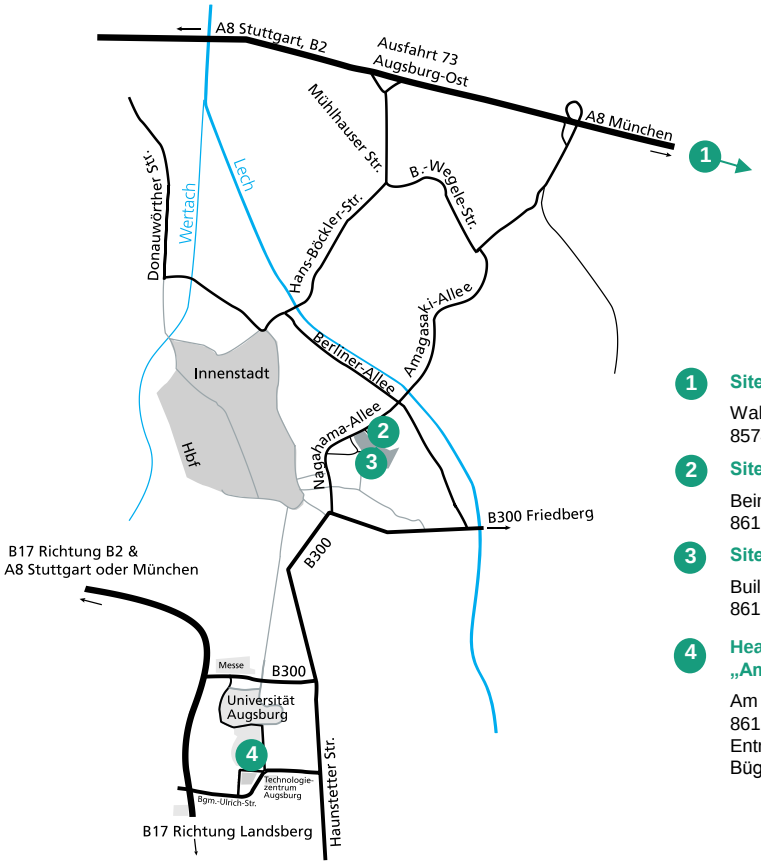
Thank you for your attention



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