Design for decent work and acceptable work/life balances

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Agenda

Future of work is working with digital technologies

Current state of work 4.0

Automation of processes	A) Autonomous non-human agents	Product ↔ Product
		↕ ↕
		Machine ↔ Machine
Digitalised information systems	B) Working with assistance systems	Tablets, head-mounted displays, analysis assistance, …
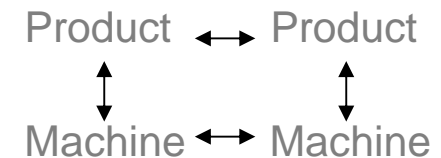
Further visions for a distant future

New business models

Value chain controlled by cyber physical systems (CPS)

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Steps to industry 4.0
– Maturity modell

Change of work

Work with detailed available Information	Work with proposals and forecasts	Work with autonomous technological agents

Computeri-sation	Connectivity	Visibility	Trans-parency	Predictive capacity	Adaptability
1	2	3	4	5	6

Today →

Limited use of digital technologies in own production process

VDMA (2016): Impuls. Digital-vernetztes Denken in der Produktion

Remote Services (remote diagnosis, remote maintenance, software-updates)
| 56% | 12% |

Condition Monitoring (digital monitoring of operating state)
| 36% | 21% |

Software for modeling / simulation of production process
| 34% | 19% |

Machine with ability to exchange information with other machines
| 19% | 26% |

Data oriented services / services on the base of Big Data
| 11% | 19% |

Online survey of VDMA member compamies, N=335

■ Still in use   ■ Planned for the next 3 years

Industry 4.0. Not only a matter of technology

Possible scenarios for economy and society

Economic structure	Platform economy, volatile value chains with changing partners
New business models	Core competence = delivering mobility, light, production capacity, workforce, … / combined with outsourcing
New structure of employment	General upskilling? Differentiation into "nice jobs" and "lousy jobs"? Rise of "bullshit jobs" (D. Graeber)?
New kind of work and employment	App as employer, crowdworking ("gig economy"), mini jobs outside social security, "latte macchiato workplace", …

Driver and resources of change are complex

Outcome is almost unpredictable, but it is necessary to prepare for scenarios

Agenda

1. Possible futures of production

2. **Consequences for working conditions**

3. Designing decent work

Wide range of options for work design

Desirable options

- Use of technology to relieve work load
- Use of technology to integrate disabled persons
- Better work life balance
- Upskilling (worker as conductor / manager of technology)
- …

Concerns

- Unemployment of less educated people
- Growing psychological hazards (multitasking, growing demands for flexibility and availability)
- Precarious working conditions of freelancer
- Fully transparent worker
- Modern taylorism
- …

What will happen?
- **No technological determinism**
- **Future of work design is shaped by humans**

Today's Consequences of technological modernization: Survey of the Ministry of Labour and Social Affairs

Key Findings

- Work is in some aspects more demanding: Skill and competences, performance requirements

- Resources to cope with work load are not growing sufficiently

Implication

- Necessity for a new orientation of the design processes
- Orientation model for change management

What is a good socio technical design?

Result of	Need for …	Characteristics of today's processes of work design
Targets	Attractive targets for a roadmap integrating *technoloy, organisation* and *personnel* as a base	Targets mainly for technology and productivity
and		
Characteristics of the design process	Evaluation of progress Involvement of stakeholders Balance of targets: protection and flexibility, … …	Evaluation mainly of technological progress

Research project **Adaption**
http://www.adaption-projekt.de/

Regulation of work: Some critical issues in the current debate

Topic	Under debate: Examples
Working time act	11 h / 9h rest after work still necessary? How to deal with a short interruption of the rest period?
Healty and safety	Better protection against negative psychological strain necessary? How to manage?
Protection of personal data	Are we forced to limit protection with the purpose of a better use of big data?
Co-determination	Is more or less co-determination needed to modernize successfully? Is individual participation the better alternative?
Protection for the solo self-employd	Do they sufficiently care for themselves? How to improve protection?
Growth of productivity	Is technological unemployment possible? Need to reduce working time, robot tax, basic income, need to define "human quotas" for any sector?

Agenda

Processes to foster decent work – Model of technology assessment

Vorstand

Outcomes

- Acceptable
- Sustainable
- Desirable

Needed qualities of design process

- Anticipation
- Deliberation
- Reflection

Orientation Model

New prospects

- Project Adaption
- Project Steps
- Orientation on RRI (responsible research and innovation)

Missing: structured way to evaluate the degree to which practices of modernising companies align with responsible work design

What is decent work?
– Two main orientations

5 levels of human oriented work design (ergonomical criteria)

Participation

Contentment and Beneficial to personal development

Reasonability and Freedom from detraction

Practicability

Safety and Tolerability

DGB-Index Good Work (Gute Arbeit)

- Acceptable work load

- Resources to maintain the work load

- Safety and security (income, future perspectives)

Responsible design of work
– Maturity model of the design process

|	
Motivation (Purpose)	Ethical motivation for the designing of work (decent work) …
Process	Anticipation / risk assessment Stakeholder engagement is part of process Reflection and measures to prevent risks Governance for responsible work design Responsivness to feedback and outcomes
Outcomes (work process and work design)	Sustainability (work ability, competence) Diversity Inclusion …

Based on: Stahl, u.a. (2017): The Responsible Research an Innovation (RRI) Maturity Model: Linking Theory and Practice. www.mdpi.com/journal/sustinability

Designing work in projects: Experiences

IG Metall cooperates with networks and projects: Arbeit 2020, It's owl, network industry 4.0

- **Gains:** Participative work design, decent work as target from the beginning

- Development of an instrument to foster reflexivity and participation (*factory map* / "Betriebslandkarte")

- **Results**: high degree of usability of the technology, improvement of production process (learning, quality, productivity), protection of personal data, …

Betriebslandkarte Industrie und Arbeit 4.0
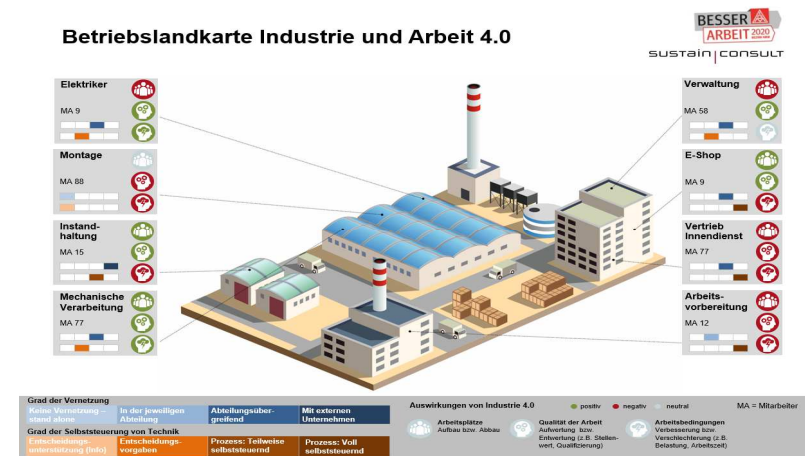
Main results:

Learning process for the involved actors

Company gains a higher level of maturity regarding to responsible work design

Qualification programmes and learning factories: IG Metal projects

- **Arbeit & Innovation 4.0:** Qualification programme for works councils, application with a project needed (employer involved).

- **Learning factory** (Ruhr University Bochum): new technology & didactic concept: Learn how to design work.
  - Step 1: Work with new technology
  - Step 2: Workplace assessment
  - Step 3: Modification of technology and work tasks / work organisation
  - Step 4: New workplace assessment
  - → …

Conclusion

- Good work design needs processes that provide **acceptable**, **sustainable** and **desirable outcomes**

- Processes must include **anticipation**, **deliberation** and **reflection**

- Projects which follow these guidelines lead to a **higher level of maturity** regarding to responsible work design

Kontakt

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