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Work 4.0 – Revolution or gradual reform?

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Work 4.0

„Arbeit 4.0“: term comes from the german discourse
It derived from the so called 4th industrial revolution and the way how in software development different versions are numbered.

Cyber Physical Systems

Anglo-saxon discourse
Information and communikation technologies play important role

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Chronology of Terms and Definitions in connection with Work 4.0

Phase	Stage of Development	Examples
1. Industrial Revolution End of 18th Century	Mechanical production with the help of water or steam	Weaving Loom
2. Industrial Revolution Beginning of 20th Century	Massproduction and division of labour with the help of electricity and electronics	Conveyor Belt
3. Industrial Revolution Beginning of 1970s	Automation of Production with the help of electronics und information technologies	Digital Office, Robots, Internet, Laptop, Mobile Phones, Web 2.0, Broadband, Social Media, Big Data
4. Industrial Revolution Work 4.0 today	Use of cyber physical systems, intelligent factory, interconnected office	Radio-Frequency Identification (RFID), 3D-Printer / Machine-to-Machine commuication (M2M) / Internet of Things

Adaption von Holtgrewe et al. 2016 & Viernull Magazin 2016

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Work 4.0 – what are the pictures presented?

Human-Robot-Touch Antropomorphism and Humanisation of Technology
https://www.land.nrw/de/blogbeitrag/was-veraendert-die-arbeit-40-minister-schneider-laedt-zum-dialog-ein

In Anlehnung an Igelsböck (2016)

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Work 4.0 – what are the pictures presented?

Gear, Wheels and Managers controlling a huge economic system
http://blog.otto-office.com/wandelnde-berufswelt

In Anlehnung an Igelsböck (2016)

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Work 4.0 – what are the pictures presented?

Tablet Control through the eyes of the worker
http://www.plattform-i40.de/I40/Navigation/DE/Industrie40/Handlungsfelder/Arbeit40/arbeit-40.html

In Anlehnung an Igelsböck (2016)

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Work 4.0 – what are the pictures presented?

Augmented Reality
http://www.unternehmens-kultur.com/blog-1/2015/9/7/25-thesen-zur-zukunft-der-arbeit

In Anlehnung an Igelsböck (2016)

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Work 4.0 – what are the pictures presented?

Deserted Factory
https://www.bertelsmann-stiftung.de/de/themen/aktuelle-meldungen/2015/maerz/megatrend-digitalisierung/

In Anlehnung an Igelsböck (2016)

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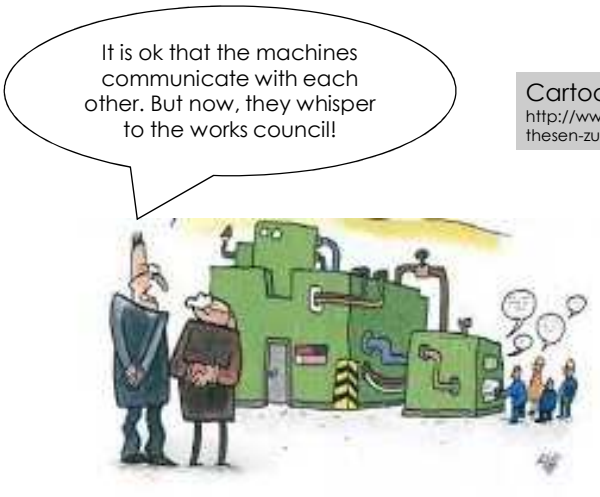
Work 4.0 – what are the pictures presented?



Cartoons & Parodies
http://www.cio.de/a/25-thesen-zur-arbeit-4-0,3247469

In Anlehnung an Igelsböck (2016)

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Is it a revolution or gradual reform?

Process of implementation of new technologies is slow, gradual and ongoing.

What is new?

Work processes get faster, more anonymous, and use and produce a multiple amount of data.

But …

Not everything that is possible is also implemented!

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„You have to understand that technological options are not the same as their application. (...) When you look at the situation in most companies, you will find out that the world of tomorrow rather is the world of the day after tomorrow.“ “

Melanie Arntz, Zentrum für Europäische Wirtschaftsforschung (ZEW)
In: Landgesell (2016)

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Laid off?
Employment trends and forecasts

- 47% of all jobs in the US („Oxford-Study“, Frey/Osborne 2013) and 54,1% of jobs in Austria (Bowles 2014) are potentionally automatable during the next years
- Dynamic of 1.5 Mio jobs in Germany (rise or decrease) (Spath 2013, S. 46ff)
- Up to 390,000 new jobs in Germany during the next 10 years (Boston Consulting, Rüßmann et al. 2015)
- In Austria every 10th job is endangered in the medium term (Nagl/Titelbach 2017)

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Distribution of Work

We have to ask questions

- → about how different sectors, jobs, regions, countries, age groups, gender,… are affected
- → about new approaches for employment protection, health protection, social dialogue, collective bargaining, …
- → about the definition of „dependent employees“
- → about the definition of (gainful) eployment and work

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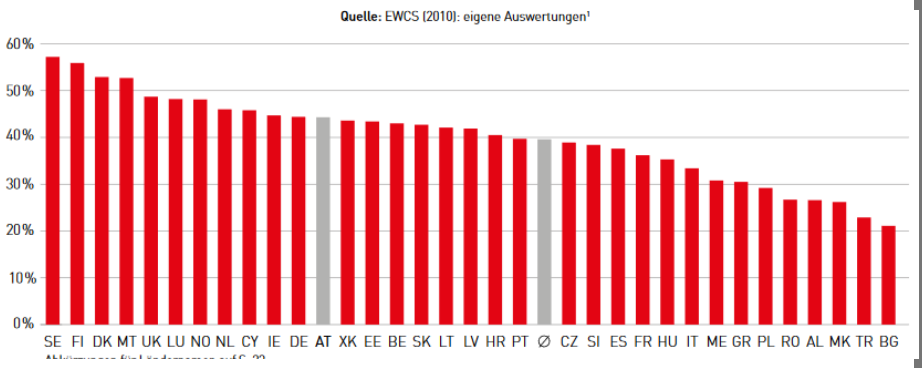
Employees which experienced the implementation of new technologies during the last three years



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Companies which offer further training in ICT

	Small	Middle	Large	Companies
FI	32 %	59 %	88 %	
AT	28 %	59 %	87 %	
DE	23 %	50 %	80 %	
SI	22 %	49 %	79 %	
EU-28	17 %	40 %	69 %	
IT	10 %	25 %	53 %	
BG	6 %	13 %	34 %	

Quellen: Eurostat, Europäische Erhebung über den IKT-Einsatz in Haushalten und über den IKT-Einsatz in Unternehmen, Jahreswerte 2015 und Zeitreihe

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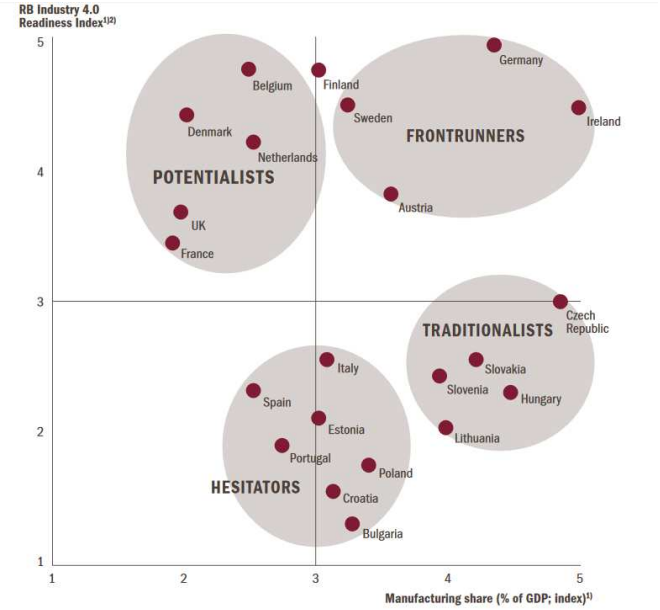
Readiness Check Industry 4.0



1) 1 = low, 5 = high

https://www.rolandberger.com/publications/publication_pdf/roland_berger_tab_industry_4_0_20140403.pdf

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Reasons for dynamics in employment

Digitisation and Work 4.0 play an important role, but are not the one and only driver!

Trends:

- **Rationalisation, Digitisation and Automation**
- Relocation and Fragmentation of Work
- Consumption Work

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Rationalisation, Digitisation und Automation

How strongly do we want to push and promote automation?
Whats the role of workers and their experiences and know-how?

Atomation-Scenario:
The aim is a self-controlled production process

or

Tools-Scenario:
The aim is that technology supports workers

(Windelband/Spöttl 2012)

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Rationalisation, Digitisation und Automation

→ Direction of the development is still open and different according to sectors, companies and countries

→ There is no distinct or necessary development direction:

Expansion of scope of action, rise of qualification and participative management

Expansion of devision of work, standardisation and deskilling

→ In this context future distribution of work is still open

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Polarisation: Individualisation and external control

Individualisation, high autonomy, freedom and scope of action, high responsibilities, extensive working hours and internalised pressure

External control, standardised tasks, low paid, monitored via digital technologies, putative replacable staff

Both developments rely on digital technologies to a great extent

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Individualisation

… e.g. project workers, middle and higher management

- Standard employment is declining: E.g. All-In Contracts and disregard of working time regulation, pressure is internalised.
- Problem of boundariless work started with flexible working time arrangements in combination with technological innovations (mobile tools).
- Mobile work: in Austria 22% of all employees get mobile devices including the access to the internet from their employer (Companies with more than 10 employees). In ICT: 65% (Statistik Austria 2015).

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Individualisation

„(…)you think that you have to be available for the company all the time. If I get an E-Mail on the weekend, I answer it. There is not any line, when working time is over. On the one hand side this means stress, because you think you have to be available alle the time. If the boss says „I need you tomorrow at 7 p.m.“ then you work from 7 to 10 in the evening. Perhaps some don‘t dare to say no. I don‘t know. Because it is paid in the all-in contract.“ (All-In Worker, IT, 2015)

Individualisation

… e.g. project workers, middle and higher management

- also some small trends in the opposite direction:
  Share of german academics working from home in a regular way is decreasing; highest level in 2008: 33% → 2014: 25% (Brenke 2014)

- but also trend to „desk sharing“ in offices:
  Has the risk of anonymisation and alienation

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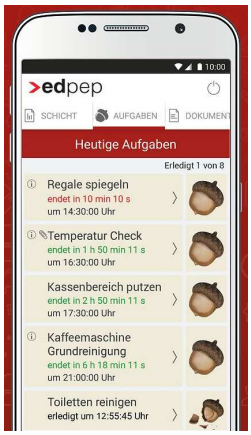
External Control

… e.g. personal services, mobile health care

Smart phone technology is used for documentation and to communicate staff rosters.

There is a high risk of anonymisation and alienation and employees miss the recognition of personal communication.



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Problem of gratification

- Missig balance of performance and compensation in form of money, carreer, employment security or recognition
- Performance-oriented self-esteem is suffering

Vircious circle of exhaustion

- People earn self-esteem through supernatural performance
- To be needed gives sence to what we are doing. „stress makes you happy“
- After this „up“ there is fatigue – you motivate yourself again – more fatigue – you feel worthless – work even harder - collapse

Reasons for dynamics in employment

Digitisation and Work 4.0 play an important role, but are not the one and only driver!

Trends:

- Rationalisation, Digitisation and Automation
- **Relocation and Fragmentation of Work**
- Consumption Work

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Relocation and Fragmentation of Work

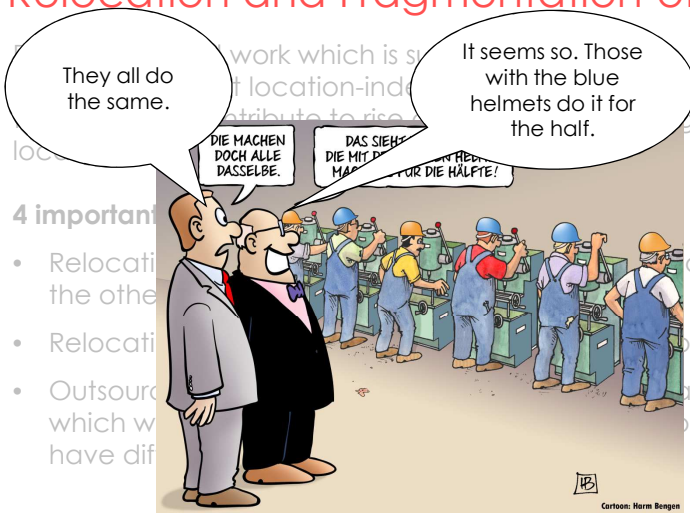
Digital work and work which is supported by digital technoligies is not location-independent at all, but technologies contribute to rise of option for choosing a location

4 important forms of „relocation“ of work

- Relocation within a company or corporation (people at the other side of the world have same employer)
- Relocation through Outsourcing to another company
- Outsourcing of work to workers of another company, which work at the same place (workers at one company have different employers)
- Relocation through Crowdworking Platforms to individual workers (self-employed)

28 All developments rely on digital technologies to a great extent

Relocation and Fragmentation of Work



https://www.igmetall.de/neue-bundesregierung-muss-werkvertraege-regulieren-12385.htm

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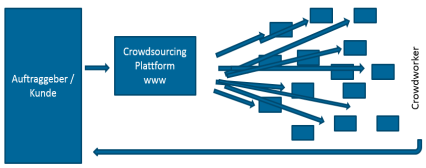
Crowdworking Platforms



→ Precarisation: self-employment whith low income, no seperation of work and freetime or of workplace and home, high pressure to get projects

Companyborders get loose. Companies or Customers use platforms for outsourcing to precarious self-employed workers

Plattformbased work:

- Digital work via e.g. AMT, 99designs,…
- Lokal based work via e.g. Uber, MyHammer, Helpling,…

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Crowdworking Platforms

"The first thing I do in the morning, after getting up is switching on the computer, then I feed the cat and prepare breakfast. But then I'm curious and I have to switch on my mobile, because maybe something [a request, project] rolled in during night time. From Canada or America sometimes requests come after midnight and occasionally I'm not online any more after midnight."

"When you are the first who applies for a job and you have somewhat decent communication skills and your pricing is acceptable, you are contacted rather quickly. So, it's about quickness, people [the clients] are not waiting for long."

"If I don't confirm jobs on my mobile immediately I wouldn't even get half the jobs I'm getting now."

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Reasons for dynamics in employment

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Consumption Work

or Prosumption (Production + Consumption), self-service of customers or citizens, customers become part of the value chain or administration

- E.g.: banks, shops: customers take over search, dataentry and payment (often online)
- E.g.: games and competitions in the form of unpaid work

reCaptcha serves as a tool to identify you as an individual. In addition it is a tool for digitisation of numbers and letters for google earth

Developments rely on digital technologies to a great extent

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Empirical Results

Future will be characterised by:

- Technological progress
- Globalisation: Relocation and Outsourcing
- Fragmented and unsecure employment
- Differences in working conditions between and within sectors and jobs
- Rise of standardised and subjective work
- Blending of work and free-time

Empirical Results

- Consequences of digitisation must not be underestimated, but scenarios of natural tremendous job reduction are not appropriate.
- Complexity of connected technologies is rising, new interfaces emerge and the need for coordination rises.
- Consequences of the use of information and communication technologies do not result from the technology itself.
- Consequences result from the conditions and modalities of their implementation.

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Central Subjects for Workers Representatives and Unions

- Establish international cooperations between workers representatives along the value chains
- Design and implementation of technology need to be oriented on human needs: important role of participation
- Identify and support the positive aspects of technology and combat the negative ones
- Safety of handling of new technologies (E.g. Virtual-Reality-Sickness because of the use of wearable computers)
- Data Security and Data Privacy
- Secure labour market participation through qualification
- Financing of post-growth societies: working time reduction and new forms of taxation

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Central Subjects for Workers Representatives and Unions

- Establish intern… …ers representative…
- Design and im… …be oriented on hu… …pation
- Identify and su… …logy and combat th…

http://www.bigdata-insider.de/kollaborierende-roboter-fuer-zusaetzliche-ergonomie-a-539405/

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http://www.automotiveit.eu/vw-bringt-datenbrillen-in-den-serieneinsatz/news/id-0051337

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Thank you!

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