Digitalisation & Work: Challenges and Perspectives

Dr. Martin Kuhlmann
Soziologisches Forschungsinstitut (SOFI)
an der Georg-August-Universität Göttingen
Sociological Research Institute (SOFI)
at the University of Göttingen

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Digitalisation: What is it about?

To clarify a somewhat puzzling discussion about digitalisation & work at least a little bit, it is important to differentiate

(1) **Networks and integration** of machines – man – products – things is leading towards embedded cyber-physical (production) systems (IOT)

(2) A **surge of new technologies related to working life**: RFID, augmented reality, robotics 2.0, apps, wearables and handhelds, ...

(3) Accelerated **automation** of manual and cognitive tasks:
flexible batch-size 1 production, advanced algorithms, AI, ...

(4) Digitalisation enables **new business models**: Predictive Analytics, after sales, IT-based services, esp. platforms, crowds *(collaborativ. Wikipedia, Tripadvisor; digitale markets: Uber, Airbnb; Online-Outsourcing [crowd-/cloud-working]: clickworker)*
What is going on: some findings (1)

(1) Up to now, organisational and social changes has been more important for work than technologies.
   (e.g. globalisation, lean production, labour legislation, demography, work values)

(2) Practitioners are often sceptical about the hype around 4.0 ...
   ... but, the new “new technologies” are already in use (or planned to be used).

(3) work policy (the design of work and organisation) is an important issue:
   → process optimization
   → operational leadership / management
   → flexibility
   → demographic change / skill shortage / (vocational) training

(4) In SMEs as well as in Germany in general the middle level of skill (skilled workers, technicians, supervisors) is seen as a competitive advantage (backbone):
   type of know-how, responsibility, engagement, dual system of voc. training
What is going on: some findings (2)

(5) heterogeneous but accelerating diffusion of 4.0-technologies ... ... with substantial differences between industries/sectors and fields of activity

(6) reliable forecasts of effects on work are so far hardly possible, but ...

(7) ... some preliminary results (generalisable findings) are available.
Effects on work: generalisable findings (1)

- **no uniform effects on work;** differences according to
  - sectors, fields of activity, technologies, ...
  - in sum: often up-skilling; but also: down-skilling; a lot of continuity
  - also: qualitative changes

- **digitalisation** often as an *intensifier* and *accelerator* of already *ongoing* trends and dynamics
  - flexible work, standardisation, formalisation, enhanced transparency
  - (vocational skill based) practical/tacit knowledge remains important
  - middle level of skill remains or becomes even more important
    (diverging result compared to the Anglo-Saxian world)
  - new technical skills *plus* higher competences around communication,
    (cross-functional) cooperation, self-organisation, process knowledge

- effects on work are mostly *evolutionary,* seldom disruptive
Effects on work: generalisable findings (2)

- **work policies (organisational strategies and concepts) are important**
  - they are becoming even more important because of digitalisation
  - often: path-dependent

- **growing need for work and organisational design (work policy)**
  - new technologies are designable

- **actors** (as well as **organisational structures** and **cultures**) are often **ill-prepared** to handle this
  - design of systems/technologies often distant from the shop-floor (doing level) and dominated by experts
  - training is often deficient (too late / too little / formal / too selective)
    - still not solved: the integration of working and learning
  - operations management (first-level supervisors) not much involved
  - works councils (trade union reps) are often ill-prepared (feel unsecure / uneasy with digitalisation) – and are therefore often sceptical
  - HR: no strategic actor, re-acting (at best), distant from work processes
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(7) ... some preliminary results (generalisable findings) are available.

(8) ... it is possible to identify some problems, challenges and perspectives.
Digitalisation & work: six challenges

(1) **task profiles/composition** and **roles** of human beings / work

(2) opportunities for **participation in** the **development/adaption, implementation** and **usage of technologies and systems**

(3) **consequences** of higher levels of **transparency** of systems and processes (How to use this)

(4) **skill requirements** and (vocational/further) **training issues**

(5) dealing with **extended flexibility** (requirements)

(6) design **requirements**, institutional and social **prerequisites** (and consequences) in the context of **new business models**
Digitalisation & work: six challenges /1

(1) **work organisation** (on the **doing-level**)
   → **task-integrated, self-organisation- and team-based**
   → combining **standardised and automated processes** with **autonomy/discretion** as well as **possibilities of intervention**

(2) **influence / opportunities for participation** of practitioners on the 1.) **development**, 2.) **implementation** and 3.) **usage** of technical systems
   → **usability** – **acceptance** (‘Akzeptanz’) – **performance**
   → active **role** of **first-level supervisors/management**
   → new, more substantial forms of **participation** on the doing-level

(3) extended possibilities for **communications and interaction**
   → combining **analogue/face-to-face** with **digital** communication
   → extended collaboration across domains, hierarchies, organisations
Digitalisation & work: six challenges /2

(4) **Handling** the growing demand for **flexibility**
   → from companies/markets AND employees
   → **negotiating, balancing** demands (power imbalances as problem)

(5) **Dealing with growing transparency** of systems and processes
   → **Who** uses it? **For what ends? How** is transparency used?
   → needs to be **discussed/negotiated** und **regulated**
   → supply and **usage** of data as **close to the doing-level** as possible

(6) **Skills / Skill formation**
   → **IT-Knowhow** and **process knowledge** (even) more important
      but also: **social-** as well as **self-competencies**
   → **domain specific professional knowledge, experience-based** and
      **tacit knowledge** are still important
   → **learning-friendly work organisation** and **working conditions**
   → **working** AND **learning; less inequality in further training**
Conclusion

1. **work** will **change qualitatively** and ...
   ... there is a **growing need for work policy** (organisational design).

2. more **likely trends** because of digitalisation:
   → **processes** are becoming (even) **more automated**
   → **interlinking, integration** and **complexity** of processes will **rise**
   → **work processes** are becoming **more transparent** and **flexible**
   → **growing importance** of **work / organisational design** (work policy)

3. **training** should be **less selective and restricted**
   → the knowledge base is **constantly renewing** because of technologies
   → **IT-related know-how** becomes (even) **more important** but, ...
   → **vocational skills** as well as **practical/tacit knowledge** remain **important**
   → **learning-oriented work systems** (and **conditions**) are **important**

4. there is a need for much stronger and more integrated **connections**
   between **personnel, organisational** and **process development**