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)

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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 **accelerater** 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

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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** und **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**

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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**

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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**

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