

Dynamics of agency within complex systems

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Industrial work in transformation

Artificial intelligence (AI) and automation technologies are increasingly being used to enhance industrial processes. It remains uncertain, however, how the application of this technology transforms industrial work. In the proposed thesis and relevant projects, we address this question from the perspective of:

- cognitive systems
- AI, automation and autonomy
- process transparency
- resilience
- skill requirements and task allocation

The study is a 4-year doctoral thesis project aiming towards determining how worker agency is affected by the use of intelligent technology in industrial manufacturing, and developing models that help industrial organizations make conscious decisions about resilience and human-machine collaboration in the implementation of automated and AI-based technologies. The study is conducted as interviews and on-site observations with operators and managers in relevant industrial fields.

Industrial digitalization challenges worker agency

The influence of AI on work practices is a popular, multifaceted topic. Emerging human-machine close collaboration in unprecedented scale raises questions about task allocation and skill preservation.

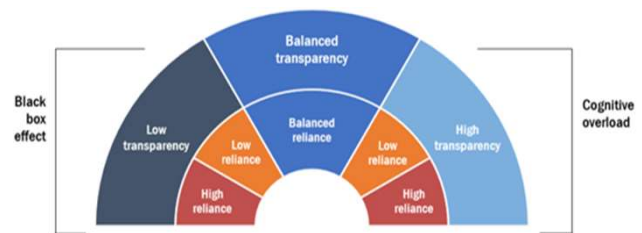
We approach the subject from following viewpoints:

- **Hybrid Intelligence** as a solution for resilient, upskilling human-AI collaboration
- **Embodiment** as a source of resilience, meaningfulness, and skill retention
- **Fragmented intelligence** / **skill fragmentation** as a risk of unsuccessful implementation of intelligent technologies
- **Transparency** and understandability as guideline for promoting worker skills and a resilient use of AI
- **"Double black box"** effect vs. **"infobesity"** as main concerns for resilient AI design
- How these viewpoints undermine or promote worker **agency**

Fragmented intelligence is a logical consequence of a "double black box"



Balanced AI transparency and user reliance to support upskilling and resilience



The project supports the intelligent technology transition in industry by

- Helping industrial organizations make conscious decisions about resilience and human-machine collaboration in AI implementation.
- Determining the systemic interdependencies associated with implementation of AI within industrial work processes
- Developing models for managing the double black box effect and promote AI transparency and understandability in an industrial setting

Use this QR code to read our article
AI and the transformation of industrial work: Hybrid intelligence vs double-black box effect.

Applied Ergonomics, Volume 118, 2024.

