Digital Humanism: How to shape digitalisation in the age of global challenges?

Resuming Experiences in Human-centred Design
of Computer-assisted Knowledge Work Processes

Extended abstract by Prof. Dr.-Ing. Peter Brödner, Siegen University

Under the labels of »AI« and »Machine Learning«, adaptive systems using methods of function approximation for adapting their performance to given sets of data from the environment are increasingly being deployed in the domain of knowledge work. Their design and effective use raise new questions with respect to their specific qualities.

Summarizing relevant experiences from more than four decades of human-centred design of software artifacts and computer-assisted work processes, I want to reflect on the results achieved under the perspectives of

• how far lessons learned can further be applied to future systems design with particular regard to specific qualities of adaptive systems (often erroneously referred to as »AI«),

• what are new challenges brought about by those adaptive systems,

• what new research questions related to their design need to be raised.

Answers to these questions entirely depend on the concept of man underlying the research and design processes. At this stage, two conflictive concepts prevail: The computational model of mind suggesting far reaching achievements in automating knowledge work versus the concept of superior human autonomy and its specific action competence making specific demands on systems behaviour. Accordingly, two opposing design perspectives exist, i.e. imitating and replacing human skills by »intelligent agents« versus using computer power for augmenting and supporting skill-based human actions.

A salient property of adaptive systems is that their current behaviour depends on their use history which means that they might react differently and unexpectedly in similar situations. This kind of intransparent and confusing systems behaviour might interfere with instrumental systems use and cause high mental stress to users exposing them to risks of mental disorder. In order to limit this kind of confusion and to avoid such stress risks, appropriate explainability of systems outcomes under user's control as well as sufficient standards for the quality and suitability of the data used for function approximation turn out to be essential design requirements.

Based on a resource-oriented relational model of stress generation proven in previous research, these relationships and appropriate design requirements that can be inferred from them will be elaborated in more detail in the paper.