Exploring ethical perspectives and views of the human and technology in IT innovation processes

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Advancements in biotechnology, nanotechnology, and A.I. bring up ethical issues that target not only our societal structures, but the question what it means to be human itself. This motivates new ways towards an ethically aligned design of new and emerging technologies. While traditional IT innovation approaches often focus on technological capabilities, alternative approaches try to account for human values in IT design and development. In a two-study mixed-methods research project covering three IT case studies, we show that a value-based approach inspired by utilitarianism, virtue ethics and deontology significantly increases creative output and ethical foresight, especially when compared to traditional product roadmapping.

PROCEDURE

- 75 participants first employed traditional product roadmapping and then the value-based approach
- Sample 1: N=40; age: M=23.9, SD=2.6; 47.5% female
- Sample 2: N=35; age: M=24.6, SD=2.6; 38.2% female

CASE STUDIES

1. smart teddy bear for entertaining children
2. app for biker couriers delivering food orders
3. platform connecting patients to specialized doctors

ANALYSES

- **Qualitative analysis**: We identified ideas that related to values and virtues, assigned common labels and categorized them based on the underlying sustainability dimension
- **Measures**: We developed measures for *fluency*, *flexibility*, and *originality* following J. P. Guilford's theory of creativity and assessed the consideration of *stakeholders* and *adverse effects* in participants' ideas
- **Quantitative**: We computed mixed-factorial ANOVAs to statistically evaluate the influence of the respective approach

Product roadmap

"What is the target group, the market situation and competition?"

vs.

Value-elicitation phase of value-based engineering

Utilitarianism
"What are harms and benefits considering the consequences?"

Virtue ethics
"What is the long-term impact on stakeholders' character?"

Deontology
"What universal moral rules or duties could be affected?"

What value(s) does this relate to?

RESULTS

- **Instrumental** values with a technical and economic focus (e.g. efficiency) dominated ideas in the traditional product roadmap, while participants acknowledged higher principles with **intrinsic** value (e.g. freedom or personal growth) in the value-based approach.
- The value-based approach considered a much broader set of **stakeholders** and took potential **adverse effects**–– not captured by the product roadmap––into account.
- At the same time, it inspired participants to be more creative: Participants came up with more than three times as many value ideas compared to the roadmap (**fluency**). Value-based ideas were also more **flexible** with regard to the spanned value classes (e.g. individual and social values) and uncovered more **original** value ideas (e.g. community or flexibility).
- Each theory of ethics showed a **unique focus** in the identification of issues and value potentials of the investigated technologies.

OUTLOOK

A better understanding of implicit beliefs and attitudes regarding humans and technology can inform research and practice in the fields of technology ethics, design, and engineering. For example, different groups of people involved in IT innovation might differ in how they see technological enhancements of the human body. In the upcoming months, I plan to develop items that account for individual differences in the view of humans and technology to test how they influence technology innovation processes.

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