

SIMP^{ORT}

Sovereign and Intuitive Management of Personal Location Information

Beyond guidelines:
What does it mean to do ethics
in software development?

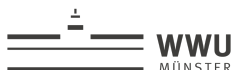
Executive summary

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Preface

This report was commissioned to develop comprehensive guidelines for the implementation of an Ethics by Design approach in software development. These guidelines should draw from the valuable experience gained during the BMBF-funded SIMPORT project. Over a period of three years, the SIMPORT project brought together software developers and ethicists in a collaborative Ethics by Design approach to develop applications for digital sovereignty by granting users of location-based services more intuitive control over their location data. The project aimed to seamlessly integrate ethical considerations into the software design process, as outlined in the project proposal.

Objectives

However, achieving deep integration of ethics into software development proved challenging during the SIMPORT project. Despite ambitious goals, day-to-day realities often exposed the typical challenges of interdisciplinary collaboration. Ethicists occasionally felt their insights were not adequately considered by developers, while developers found ethical input abstract and disconnected from their practical concerns. In this report, we ground our approach in the less obvious but very real daily practice of Ethics by Design.

From this vantage point, we outline two primary objectives:

1. **Theoretical objective:** Our foremost theoretical aim is to demonstrate that an Ethics by Design approach cannot be reduced to a set of rigid principles. It must begin by exploring and anticipating the myriad ways in which a particular technology is intertwined with social and ethical considerations. To achieve this, we articulate key insights from the Social Sciences and Humanities, highlighting the intricate interplay between technology and society, in a way that is accessible to Ethics by Design practitioners. These insights are intended to initiate thoughtful self-reflection on their ethical design practices.
2. **Empirical objective:** Recognizing the importance of amplifying the perspectives of Ethics by Design practitioners, our practical goal is to assess the extent to which they feel empowered to explore and address the social and ethical dimensions of their work. Through in-depth interviews with SIMPORT's software developers and ethicists, we aim to uncover the ideas and narratives they mobilize in articulating their respective responsibilities. By holding up a mirror, we aim to empower practitioners to engage in hands-on, collaborative initiatives for ethical software development.

Keeping these objectives in focus, we present the key theoretical and empirical findings below, serving as the foundation for the recommendations we propose in the end.

Key theoretical findings

1. **Technological mediation and consequences:** Once adopted, technologies shape how we perceive the world and what we can do in it. For instance, data-fuelled AI, while holding the promise of societal improvements, is already contributing to surveillance and widening societal inequalities. This underlines the need to anticipate that the actual impact of a technology often exceeds the original intentions of its developers.
2. **Cultural bias in technology:** From its inception, every technological affordance inherently reflects a cultural bias. A central design term like 'intuitive', for instance, carries the historical influence of profit-driven interface design. This underscores the importance of recognizing and challenging these biases in technology design.
3. **Ethics and dominant views:** The belief in a 'neutral' interpretation of ethics principles such as 'fairness' or 'human autonomy' often aligns with the dominant view, which always strikes us as self-evident. This encourages us to question the supposed neutrality of ethical principles and consider the broader societal context.
4. **Ethics principles as starting points:** Rather than rigid and neutral rules, ethics principles should serve as starting points for ongoing, reflexive deliberation. As such, neutrally framed ethics principles should come with warnings such as "beware, fairness may not be what you think it is", or "in the end, your design choices will ultimately shape human autonomy". This foregrounds the inescapable responsibility of technological design: it takes sides in the end.

Key empirical findings

1. **Socio-technical divide:** There exists a noticeable gap between ethics and software development, characterized by a perception that software developers primarily focus on functionality, while ethicists often work from a distance, employing abstract concepts. This socio-technical divide, marked by differing mindsets and narratives, impedes effective collaboration.
2. **The longing for an ethics toolbox:** Thinking within this socio-technical divide leads to a simplified view of Ethics by Design, with ethicists expected to create a universal 'ethics toolbox' for developers to ensure ethically sound outcomes. In practice, this approach leads to mutual frustration, with ethicists not meeting developers' expectations, or to the delegation of ethical responsibility to new bureaucratic structures.
3. **The role of cultural narratives:** The appeal of the 'ethics toolbox' is further reinforced by deeply ingrained, male-dominated narratives about technology and innovation. These narratives include the belief in technological solutionism, where technology is seen as the universal solution to all challenges, and the persistence of the linear innovation model, which separates research and development from societal application.
4. **The potential of open-ended practices:** However, the SIMPORT experience also shows glimpses of practices where the socio-technical divide is bridged, with new possibilities emerging. Collaboration between developers and ethicists can deconstruct entrenched narratives, highlighting the importance of experimental, open-ended practices where responsibility is actively taken in never easy but always evolving, context-specific ways.

Key recommendations

To empower practitioners in navigating social and ethical challenges in software development, we emphasize the importance of fostering a profound understanding of oneself and one's role in relation to others and society. Our recommendations are thus anchored in the narratives, practices and attitudes that guide practitioners in this pursuit.

- 1. Challenge entrenched narratives:** Disrupt culturally entrenched narratives that hinder ethical engagement in software development. Acknowledge that these narratives give shape to the role of developers and ethicists in society. Key recommendations include:
 - *Challenge stereotypes about developers and ethicists.* While some perceive developers as solely focused on functionality, needing spoon-fed ethics in bite-sized, actionable portions, others portray ethicists as armchair critics detached from practical and economic reality, relying on abstract concepts.
 - *Undercut the fallacy of 'technological solutionism',* which falsely assumes that innovation is the a priori remedy for all problems, including the ethical and social impact of technology. This belief results in a relentless pursuit of innovation.
 - *Deconstruct the myth that technology is neutral.* Embrace Social Sciences and Humanities vocabularies that highlight the inherently social nature of technology and explore concepts that emphasize power dynamics, competing interests, and ideology.
- 2. Foster open-ended, collaborative practices:** Build context-specific practices within innovation settings instead of importing generic approaches. Societal responsibility in innovation contexts should be an ongoing empirical exploration, involving all project members and external stakeholders. More specifically, we recommend to:
 - *Foster sustained socio-technical collaboration* between software developers and ethicists based on equivalence. Acknowledge and address affective tensions in interdisciplinary collaboration. Understand that moments of discomfort and frustration can be productive for transcending disciplinary boundaries.
 - *Employ existing Ethics by Design and Responsible Innovation tools* to map out responsibilities rather than shrugging them off. While cautioning against treating tools as shortcuts for ethical decision-making, we encourage their use as aids in articulating and deliberating ethical and social concerns.
 - *Consider embedding iterative reflexive exercises into agile processes* like scrum. Scrum ceremonies such as sprint planning and reviews are particularly apt to foster ethical deliberation and monitor design choices. In the absence of an embedded ethicist, consider assigning an 'ethics owner' role.

3. **Cultivate virtuous attitudes:** In navigating the intricate social implications of their actions, Ethics by Design Practitioners should adopt a virtuous attitude characterized by a clear sense of direction and determination. Key recommendations include:
- *Foster self-reflexivity:* There is an essential portion of ethics that is indispensably personal, in that it cannot be delegated. Allocate time for introspection, delving in the narratives and beliefs guiding your work. Analyze the origins and motivations behind your practices, organizational structures, and routines.
 - *Facilitate collective sensitivity:* Establish dedicated spaces and allocate time for team-wide reflection, discussions, and debates. Implement methodological approaches for group reflection to cultivate sensitivity and awareness of diverse perspectives.
 - *Embrace courageous determination:* Understand that ethics is not a one-time task, but an enduring commitment to navigating the intricate web of societal impact within one's actions. Challenge the status quo by transcending routine narratives and practices, willing to adapt to evolving ethical challenges.

Conclusion: Ethics beyond guidelines

In response to the task of developing guidelines for an Ethics by Design approach in software development, this ethics primer challenges the conventional, deontological model of ethics often found in guidelines. We argue that true ethical integration requires a deeper approach, one that embeds ethical reflection into the heart of the development process. This involves cultivating sensitivity to the complex interplay between technology and society, addressing power dynamics, and challenging cultural biases. Our findings reveal that Ethics by Design cannot be reduced to rigid principles but should be seen as a dynamic and ongoing practice. Bridging the socio-technical divide and disrupting entrenched narratives are essential steps toward meaningful integration of ethics in software development. We recommend fostering open-ended, collaborative practices that involve all team members in ethical deliberation, using existing Ethics by Design and Responsible Innovation tools as aids for mapping ethical and social considerations rather than shortcuts for ethical decision-making. Additionally, practitioners should cultivate virtuous attitudes, including self-reflexivity, collective sensitivity, and courageous determination. Fostering such attributes requires a supportive environment that values reflexive work and provides the necessary conditions.