

Experimenting with the Ethical Impact Assessment as a Grounding Socio-Technical Practice

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ABSTRACT

This paper discusses an experiment with a formative method for ethical impact assessment (EIA) in the context of IT design for multi-agency crisis management that draws on scenarios and role-playing to ground ethics in a broader socio-technical domain not just in user needs and values. Contextualising the EIA discussions in this way opened up new avenues for addressing ethical concerns, broadening the design context from a focus on usability to thinking creatively and collaboratively through ethical, legal and social implications.

Keywords

Ethical impact assessment, design, innovation, situated practice

INTRODUCTION

This paper explores what it means to practice ethical socio-technical innovation¹ in crisis management. To do so, it explores how ethical impacts of an innovation process can be assessed in ways that encourage ‘good’ practice based on deliberation, whilst avoiding the trap of policing design or use through ‘experts’. It provides a summary and analysis of an experimental ethical impact assessment (EIA) in the context of a project developing a common information space concept and technologies for international cross-agency collaboration (www.SecInCoRe.eu). The EIA used a scenario and role-playing to expand and experiment methodologically with how ethical impact assessment might be undertaken as part of innovation. This experiment helped us see ethical impacts as a living process rather than abstract issues, and to form new lines of inquiry that integrated the social and the technical. It offers insight into a way to develop better tools for identifying ethical issues that will need to be addressed in the design and use of a socio-technical system.

We begin with an overview of the aims of the EIA and then briefly describe the process. We analyse key results, identifying emergent themes and issues. In the process, we highlight moments where key ethical, legal, and social issues (ELSI) were identified, where proposals emerged for addressing them, and where new questions arose. The paper concludes with an evaluation of the effort and suggestions for follow on work.

¹ ‘Innovation’ does not denote a discrete groundbreaking invention or original product here, but a process where new ways of working are shaped in relation to new technologies (Ingram, Shove and Watson, 2007).

RETHINKING THE EIA

We are interested in how to expand EIA from a process of policing, expert evaluation, or finding immediate solutions, to one of formative reflection and mutual learning (Twidale and Randall, 1994). Using a participatory and co-design framework our aims included:

- *Making ELSI concrete*: To think through ELSI in emergency management concretely with reference to a specific case study so that our design and concepts may help notice and address them productively.
- *Deeper dialog*: Engage with ELSI through collective multi-disciplinary inquiry, including perspectives from emergency response practitioners, social scientists, and IT designers.
- *ELSI aware innovation*: To bring attention to how ELSI are emergent within design and situated use in a critical, creative and constructive manner. Identifying ELSI should not just be a matter for periodic expert-led evaluation. Designers and users should be supported in a more sustained way in defining what makes good technologically augmented crisis management.

The aim of the EIA is to provide tools to examine the ethical issues surrounding the “design, use and social impact of technology” (Verbeek, 2011, p. 3) as well as the study of the technology itself, including its embedded values (Nissenbaum, 1998; Floridi 1999). In some ways, the EIA is a form of disclosive ethics (Introna, 2009) aiming to bring to light the morally opaque features (Brey, 2000) of technological design and use. A variety of approaches to ethical impact assessments of information technology have been developed for both policy makers and technology developers and typically emphasise the importance of identifying and involving stakeholders in the process. One prominent example is Wright’s (2011) EIA framework. This includes a set of ethical principles and values to be explored through surveys, user panels, checklists, and lists of questions. The framework also includes procedures to ensure that stakeholders are engaged, that the process is transparent, that results are communicated to the public and independently evaluated.

Other approaches to evaluating ethical impacts include Value Sensitive Design, based in human-computer interaction, which aims to provide a theoretical and methodological framework for handling “the value dimension of design work” that asks for iterative evaluation practices through the life of a project (Friedman, Kahn and Borning, 2013, 70). There has also been a long history of user-centred design that addresses the views, practices and needs of users. However, Yoo et al. (2013) argue that while these user-centred approaches have often focused on end-user needs and desires, there has not been the same focus on societal concerns or values, suggesting that we need to focus on designing for not just the user but the broader socio-technical context of use. In a similar vein, DiSalvo et al. (2014, p. 2403) argue that design practices should work with users to develop support structures or “infrastructures” to support “collective inquiry into matters of concern”, including emergent ethical issues and their consequences. Many EIA methods are procedural, assuming that ethical values can be defined, issues identified and addressed in an iterative manner. But as Yoo et al. and Di Salvo et al. point out, when supporting deliberation rather than instruction and when contextualizing ELSI in these broader frames, EIAs need to be able to ground the design process in a simultaneously concrete and open manner. Inspired by these and social science studies that show that, in practice, these are not separate phases (e.g. constructive technology assessment, Schot and Rip, 1997), this EIA experimented with scenarios to try to ground design and use in matters of concern and provide a richer understanding of how ethical issues could be addressed.

Scenarios are also commonly used as a tool in design. They can help “designers get more of a feel for the potentials and problems of their future artefact in context, and thus really to understand the problems as well as their current solution better” (Bodker, 2000, p. 73) and evoke “action-orientated reflection” about different design moves and diverse user practices – as opposed to cleanly delimited “user needs” (Carroll, 2000, p. 50). This makes it possible to learn more about the dynamics of a problem domain, to see from a range of perspectives, and interact intimately with a concrete situation (ibid., p. 57). However, scenarios are seldom used in design with an explicit emphasis on ELSI. This is in contrast to the field of ethics where both scenarios and role-plays are used as tools for ethical enquiry. In applied ethics settings, particularly in business and educational settings, participants may role-play different situations as a way of gaining ethical insight (e.g. Brown, 1994) and for developing broader awareness.

THE SCENARIO-BASED EIA PROCESS

To facilitate deeper reflection, learning and grounding in how ELSI manifest concretely in multi-agency collaboration, this EIA staged an encounter between a fictional disaster management committee looking for new

collaboration technology and our project's design team. The committee was played by the project's domain analysis team comprised of social scientists, legal scholars and a representative of the British Association for Professionals in Public Safety and Civil Contingencies Communications and Information Systems (British APCO), a practitioner with over 30 years of experience as a senior police officer. All social science researchers have experience of participant observation with emergency responders as well as knowledge of the literature. The design team was played by engineers and computer scientists in the project, most of whom have also worked with emergency responders. The idea was not to simulate real world experience with maximum fidelity to 'tell it like it is', but to seek concrete grounding in different knowledges and perspectives of real world practice.

The fictitious commissioning committee specifically looked for support in addressing ELSI arising in multi-agency collaborations. This was based on their experiences during the Germanwings crash, which were described in a briefing document. This brief was given to the technical/conceptual developers, who were asked to make a pitch for the SecInCoRe project's products, explaining how the SecInCoRe concept and technologies could help responders address the challenges. The role-playing members of the disaster management committee then posed questions from their respective perspectives (e.g. as legal experts, police authorities, environment agency members, aviation experts) and asked questions from those perspectives. This activity was carried out five times, with each session focusing on a different aspect of the project and involving different team members. The sessions were transcribed and analysed.

This process instigated broad discussions of the potential and the limitations of technology, needs and opportunities for technical, organizational and regulatory innovation. A range of issues was explored, from data gathering to public-private partnerships to the afterlife of data. The role-playing discussions generated new insights into ELSI and new design ideas.

EMERGENT SOCIO-TECHNICAL CONCERNS

Through using this process a number of key themes emerged that had not surfaced in previous, more procedural, EIAs undertaken by the project team. Discussions revealed the inescapably socio-technical nature of ELSI because ELSI were found to never be simply about tools, but always also about how specific practices met and even developed alongside specific technologies. Below are four of the key themes that were identified.

The Inadequacies of ELSI Sensitivity "by Design"

One conception of how to support ethical and lawful conduct was to have 'ELSI by design' (inspired by ideas on 'privacy by design' (Cavoukian, 2001)). For example access to sensitive information, such as satellite photography of the crash site, the airline's employee records and their medical data, genetic data of victims, the responders' psychological data could be controlled through role-based access protocols in the SecInCoRe system. But discussions revealed that roles change and that it is necessary to leave room for improvisation, leading the team to explore how one might support holding organisations rather than individuals accountable and how to do this also retrospectively rather than just prospectively through denying access. Technology designers cannot extract clear rules from complex data protection laws, emergency law, and information sharing agreements to enforce ethical or lawful conduct. Through the role-playing it emerged that embedding rules into technologies cannot mean: we have the ELSI solved and you do not need to worry about them. Questions were also raised around whose values are enacted through different forms of design and use. For example, the Germanwings case made clear that German conceptions of privacy are not the same as French or UK. It has to be up to the user in the specific situation to understand how ELSI might be of concern and to decide how to address them. But design can support people in noticing potential ELSI (e.g. by including meta-data that record variations in sensitivity within the data structure) and by enabling flexible, yet accountable access.

Building trust in data

The role-playing design pitches often focused on measures for showing levels of authenticity and accuracy of data and the security of the system, almost to the point where trust in other people remained unaddressed. At the same time, the disaster management committee's experiences in multi-agency response and knowledge of the Germanwings case highlighted that trust in other people is often what shapes practices of data-sharing. This led discussions to circle around trust as an active practice, which may be experiential, contextual, intuitive, social, emotional, and not just rational. For example, if interactions with data, technologies, or people produce positive experiences, people will trust. Data consulted in the Germanwings collaboration included, for example, the co-

pilot's employment and medical records, information regarding the co-pilots private life (e.g. Facebook page, interviews with friends/former partner, Internet search records), email correspondence regarding the co-pilot, previous flight records which had been seen as normal, but now came to seem like test-runs for the crash. Reflecting on processes of assembling and making sense of this kind of information highlighted practices of *trusting*. For example, if data seems irrelevant or inconsistent, people will not trust it, what might seem normal in isolation can tell a different story when seen in context. Trust is a situated practical accomplishment, it is *made* in such practices (Clarke, Hardstone, Rouncefield and Sommerville, 2006).

As the role-players asked questions about how they could trust the data, we realised there was a disconnect between the questions (about their practices with data) and the answers (about system security). Consequently, we started to ask: what makes trustworthiness? Accuracy? Consistency? Previous Experience? Completeness? Comparability? Security? The discussions turned from a check box of whether data is trusted or not, to how to map relationships between data, technological practices, and ethical issues and how to build support for practices of trusting into search algorithms to produce domain and situation relevant results (not just topic relevant). This initiated a new design trajectory for the project.

Supporting quality of information

When talking about patterns emerging from assemblages of data, so easily seen retrospectively in the Germanwings case, yet missed prior to the crash, the discussions delved into what kinds of engagement with data SecInCoRe concepts and technologies should enable. The discussion raised many questions. How can one ensure data quality within a highly diverse group of contributors? How to ensure that people can represent multiple perspectives in such an internationally sensitive incident? How to deal with data that is personally sensitive in a highly mediated disaster response? One frequent conflict point in lethal disasters is between public speculation and official confirmation about who has been injured or killed. In social media, new self-organised models of ensuring trustworthiness are emerging (Palen, Vieweg, Sutton and Liu, 2009). While these may fail to meet the rigorous requirements of official obligations to ensure reliability, is there a way to enable constructive dialog with or inclusion of concerned stakeholders and new data quality/trust models? One idea that was raised was to present a mapping of different perspectives and data sources so that at least an overview can be obtained.

However, by role-playing a dialog between practitioners, the practicalities of this idea could be explored in more depth. Mapping different perspectives raises new challenges of how they should be linguistically and culturally translated in order to be understandable and comparable. This also applies with a view to coordination between the different formal agencies, where, for example, different decision making models by different response agencies involved in an incident need to be explained as part of any representation of data so that it becomes possible to understand why some things are included in one agency's view but not in another, which could otherwise easily become a source of distrust.

CONCLUSION AND FUTURE WORK

This paper discusses an experiment with a formative method for ethical impact assessment (EIA) in the context of IT design in multi-agency collaboration and information exchange that draws on scenarios and role-playing to place ethical consideration in a broader socio-technical context that goes beyond user needs and values. This highlighted ethical impacts as living socio-technical processes, not just as abstract issues. Contextualising the EIA discussions in this way opened up new avenues for addressing ethical concerns, broadening the design context from a focus on usability to thinking creatively and collaboratively through ethical, legal and social implications. It helped make visible how IT design choices themselves constructed specific ethical concerns or opportunities. Finally, the EIA proved to be a useful co-design tool, helping us see the limitations of our knowledge and experience and identify where we need to engage further with practitioners.

The aim of the EIA was *not* to test technical solutions for their viability in view of ethical, legal and social challenges, to identify wrongs in the technology or its potential use and police them. Instead, it aimed to create an environment for grounding innovation in organisational practice, technology, policy and regulatory reform in concrete experiences and examples. This overcame difficulties produced through approaches that treat as separate phases conceptualization, design, attention to ELSI, and use. By approaching design, use and ELSI as interdependent components of a larger disaster IT practice, this EIA became one step within a larger co-design process. The benefits included grounding collaborative reflection and learning in the ambiguities of real world experience, connecting complexities of practice with complexities of design through concrete narratives, and

opening debates around situated use of technologies to facilitate the development of creative strategies and responses.

The role-playing provided an opportunity for grounding research in realistic experience, but absolute fidelity and authenticity were not a goal. Even a panel of experts who had a role in the international response to the Germanwings crash and an interest in procuring new collaboration technologies would not have ensured such a goal, as some key actors would always be missing. Moreover, such a panel would lack some of the expertise we have in the project team, such as scholarly knowledge about policy, legal frameworks and the social organisation of work. The role-play enabled sufficient grounding in real world concerns for in-depth interdisciplinary exploration of the emergent quality of ELSI in the design and use of new technologies. It helped us to understand the limitations of our knowledge, experience and design approach. The temptation of research and development is all too often to identify problems and seek solutions at the expense of considering interactions and ambiguities. The EIA's insights into the emergent quality of ELSI highlight the need for design methodologies that avoid premature generalisation or being too narrowly specific, to not fall into the trap of reinforcing socio-cultural ideals that make local practice difficult.

The EIA also made us think about ourselves as ethical actors. What are our values? For instance, do we want to make users more aware of stakeholders they often exclude and the implications of such decisions? How can we be transparent about such decisions to ourselves and the prospective users of the technologies we design? This also enabled broader and more creative thinking around the shifting nature of emergency planning and response. In doing so it became clearer where, in the conceptualisation of our project, limitations exist and energy should be focused.

ACKNOWLEDGMENTS

The research is part of research funded by the European Union 7th Framework Programme in the SecInCoRe project (Grant no: 261817) and the BRIDGE project (Grant no.: 261817). We thank our colleagues for their participation in the EIA and their comments on this paper.

REFERENCES

1. Bodker, S. (2000) Scenarios in user-centred design--setting the stage for reflection and action. *Interacting with Computers*, 13, 61–75.
2. Brey, P. (2000) Disclosive Computer Ethics. *Computers and Society*, 30, 4, 10–16.
3. Brown, K. M. (1994) Using Role Play to Integrate Ethics into the Business Curriculum A Financial Management Example. *Journal of Business Ethics*, 13, 105–110.
4. Carroll, J. M. (2000) Five reasons for scenario-based design. *Interacting with Computers*, 13, 43–60.
5. Cavoukian, A. (2001) Taking Care of Business: Privacy by Design. Presentation given at the IBM/Tivoli Privacy Summit, 31 May, Toronto. <http://www.ontla.on.ca/library/repository/mon/2000/10296375.pdf>
6. Clarke, K., Hardstone, G., Rouncefield, M., and Sommerville, I. (2006) *Trust in Technology: A Socio-Technical Perspective*. London, Springer.
7. DiSalvo, C., Lodato, T., Jenkins, T., Lukens, J., and Kim, T. (2014) Making public things: how HCI design can express matters of concern. *Chi 2014*, 2397–2406. <http://doi.org/10.1145/2556288.2557359>
8. Floridi, L. (1999) Information ethics: On the philosophical foundation of computer ethics. *Ethics and Information Technology*, 1, 1, 33–52. doi:10.1023/A:1010018611096
9. Friedman, B., Kahn Jr, P. H., and Borning, A. (2013) Value Sensitive Design and Information Systems. In N. Doorn, D. Schuurbiers, I. van de Poel, and M. Gorman (eds.), *Early Engagement and New Technologies: Opening up the Laboratory*. London, Springer, 55–95.
10. Ingram, J., Shove, E., & Watson, M. (2007) Products and Practices: Selected Concepts from Science and Technology Studies and from Social Theories of Consumption and Practice. *Design Issues*, 23, 2, 3–16. doi:10.1162/desi.2007.23.2.3
11. Inrona, L. (2009) Ethics and the speaking of things. *Theory, Culture & Society*, 26, 4, 25–46. Retrieved from <http://eprints.lancs.ac.uk/23202/>
12. Nissenbaum, H. (1998) Values in the design of computer systems. *Computers in Society*, 28, 1, 38–39.

13. Palen, L., Vieweg, S., Sutton, J., and Liu, S. B. (2009) Crisis Informatics: Studying Crisis in a Networked World. *Social Science Computer Review*, 27, 4, 467–480.
14. Schot, J., and Rip, A. (1997) The past and future of constructive technology assessment. *Technological Forecasting and Social Change*, 54, 2-3, 251–268. doi:10.1016/S0040-1625(96)00180-1
15. Twidale, M., and Randall, D. (1994) Situated Evaluation for Cooperative Systems. In *Proceedings of the 1994 ACM conference on Computer supported cooperative work*, 441–452. doi:10.1145/192844.193066
16. Verbeek, P.-P. (2011) *Moralizing Technology: Understanding and Designing the Morality of Things*. Chicago, University of Chicago Press.
17. Wright, D. (2011) A framework for the ethical impact assessment of information technology. *Ethics and Information Technology*, 13, 3, 199–226. <http://doi.org/10.1007/s10676-010-9242-6>
18. Yoo, D., Hultgren, A., Woelfer, J. P., Hendry, D. G., & Friedman, B. (2013) A value sensitive action-reflection model. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems - CHI '13*, New York, ACM Press, 419-428.