Technology in Disaster Response and Management: Narratives of Ethical, Legal, and Social Issues

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ABSTRACT

Ethical, legal and social issues (ELSI) are widely recognised as important in IT innovation for crisis response and management. However, attention often struggles to get beyond theorising basic concepts, when the realities of how difficulties and opportunities manifest are complex and practical. Unless these realities are understood, solutions to ELSI will remain at the surface, missing opportunities to responsibly and creatively leverage the potential of IT in disaster response. This workshop brings together narratives of lived experiences of ethical, legal, and social issues encountered in the context of IT innovation in disaster response, and analyses of normative, policy and regulatory backgrounds. In this editorial, we motivate this turn to narrative, summarise the contributions that will be presented on the day, and set out some key questions.

Keywords

Disaster, Computer Ethics, Ethical, Legal and Social Issues, Value Sensitive Design, Humanitarian Principles

INTRODUCTION

All too often, ELSI are collapsed into shorthands, blaming 'misuse', organisational 'politics' or 'culture', or regulatory frameworks like data protection laws as barriers to progress. Yet, the realities of how difficulties and opportunities manifest are much more nuanced and practical. Unless these realities are understood, solutions to ELSI will remain on the surface, missing opportunities to responsibly and creatively leverage the potential of IT in disaster response. Moreover, information technology (IT) designers can only notice and address constraints and opportunities for innovative approaches if they can understand ELSI concretely. This workshop assembles narratives of lived experiences of ethical, legal and social issues (ELSI) encountered in the development and use of IT in disaster response as a starting point to enable more concrete and practical discussions. This is enriched with accounts of normative, policy and regulatory background. With this foray into real world experience, we seek to encourage more productive, creative and ambitious ideas and collaborative approaches to innovation amongst practitioners, public, researchers, and technology developers and designers. In this overview, we summarise the eight contributions that will be discussed on the day, and conclude with a set of questions that will structure our discussions.

ELSI TALES: LEARNING, DISCRIMINATION, AUTONOMY, INEQUALITY

Exploring the barriers to IT uptake for knowledge sharing between disaster responders, Gimenez, Labaka, Sarriegi, and Hernantes (2015) examine ELSI

involved in sharing lessons learnt. They find that IT solutions to interoperability problems cannot stand as a separate system that replaces expert and local practices. The ELITE project, from which they draw their experience and data, set out to mitigate the many barriers to sharing lessons learned between agencies. These barriers include underdeveloped social and technical communication channels, fear of punishment for sharing what might be considered subjective information, issues surrounding the maintenance of confidentiality, and an unwillingness to share failures related to individuals and organizations for fear of political, legal, and ethical consequences, that in some cases could be career ending. Considering how crucial such information is to all phases of disaster response and all responding agencies involved, designers and stakeholders alike often express great hopes that technological solutions can be found. During the ELITE project, 72 multidisciplinary experts were brought together through three scenario based workshops to establish a VCoP (Virtual Community of Practice). They envisioned the VCoP to be a living repository for documenting and sharing lessons learned. Yet, despite great workshop participation and the ELITE team's creative response to feedback the experts provided, there was little follow-through in using the system once the development phase was over. The ELSI barriers were stronger than the technological potential. As Gimenez et al explore ELSI barriers to the ELITE system's acceptance into regular practice, they elaborate on how issues of confidentiality, trust, liability, already existing hierarchies of practice, and issues with translating between cultural and linguistic differences manifest. Furthermore, lack of incentives – both internal to the organisations and in terms of policy and regulatory frameworks – played an important role in the stagnation of the system. In conclusion, they find that technology cannot stand alone – it will only work if combined with intermediary agents and active experts whose role it is to analyze, maintain, and facilitate the use of systems in ways that secure individual and organizational privacy. Along with this, both explicit and tacit layers of practice need to be supported.

Taking on issues surrounding the data itself, Jasmontaite (2015) looks into the ELSI challenges of sharing personal data. While issues regarding employee or volunteer data are relatively easy to foresee, personal data collected about affected people poses more specific legal challenges. Focusing on the rules provided by the EU Data Protection Directive (Directive 95/46/EC), Jasmontaite explores how first responders could determine the legitimate ground for the processing of personal data of affected people. Anticipating situations of disasters, first responders should determine what are legitimate grounds to invoke different legal bases for processing and sharing personal data with or without consent. Directive 95/46/EC provides for an exception - the vital or essential interests of the data subject – that could ease the hurdle for the first responders. Counting on this particular exception would be possible, as explained by the European Data Protection Authorities at times of life and death or harm to a subject's health. First responders could also share data about affected persons in order to perform their tasks being carried out in the public interest. But, Jasmontaite asks, who has the right to make such a determination? Who and what determines when such decisions are 'strictly necessary'? How can it be made in a way so as not to be questioned? Further, how can technologies be designed to aid in such a process of decision making when Article 7(f) states that such decisions should not be automatically made or extended? To explore how these questions have been answered in the past can help think about how they could be addressed in the future. Jasmontaite proposes to consider recent judgments of the Court of Justice of the EU that interpreted Directive 95/46/EU in a very restrictive way.

Jasmontaite and Dimitrova (2015) follow this line of questioning around what constitutes legitimate grounds for data sharing and mobile disaster management to take on the specific issue of personal data processing by mobile apps during emergency/disaster response. Considering the legal challenges to processing and sharing personal data by first responders via such apps is made increasingly complicated by the diverse nature of first responders: they range from state employees to volunteers, from strategic decision makers to tactical 'feet on the ground' staff, moving injured members of the public to safety. Consequently, it is difficult to have a single comprehensive legal framework. As Dimitrova and Jasmontaite explore cases in which apps have been used in disaster response, they find that such use often requires the first responders to be aware of the legal conditions and exceptions for the data processing in order for them to determine on-the-spot if such data can be legitimately processed. This becomes even more complicated when apps gather more than words, including images, communications and sounds, since incidental data comes as part of this process. The legality of data processing via mobile apps is also discussed from the

perspective of common citizens, who are directly affected by an emergency. Apps used by these citizens, they argue, need to address the privacy and data protection risks. Transparency should be an essential characteristic ensuring that citizens provide freely given, specific and informed consent to the use of such apps. In particular, citizens should be informed about their rights, the data collection and uses triggered by such apps.

Liegl and Oliphant's two papers 'Logging, surveillance and the question of autonomy in emergency response' and 'Automation, responsibility and control in actor-agent processes and systems of systems architectures' develop this discussion (2015a,b). They explore the implications of leaving some of the data processing and sharing to technology, in their case a middleware intended to enable interoperability between diverse information systems used in emergency management and response. What does moving what had used to be done by experts (or not at all) into 'the hands' of algorithms mean for responsibility, control, and autonomy? Interoperability requires the production of an overview of the situation and mutually translatable details about the workflow. Emergency responders are faced with a tension between seeing the benefits and potential of such technology but also the emergence of concerns around what would this mean in practice. Liegl and Oliphant consistently find responders finding an ELSI dilemma of what is just: speed or security in response? Similar to Gimenez, Labaka, Sarriegi, and Hernantes (2015), Liegl and Oliphant suggest that new technologies can only manage ELSI if the technologies themselves are accompanied by acknowledgements that they help produce new ways of being aware. For them, ELSI are not only found in the design of IT, but in the design after the design: in how the user comes to understand their experience though the socio-technological assemblage.

Managing issues of surveillance and monitoring are also a major concern with a view to contributions from the public, as Galdon Clavell, Arroyo-Moliner, and Sanz Pascual's contribution on social media surveillance illustrates (2015). Social media have fostered IT practices that cannot be ignored by first responders, changing their relationship to the public and introducing many new ELSI to consider around observation and surveillance. While social media provide access to information from the scene at a scale and immediacy that is beyond first responders' capabilities, it also provides first responders and decision-makers with unprecedented access to novel capacities for monitoring individuals' actions at the scenes. To examine more specifically the nuances of ELSI around surveillance and monitoring, both passive and active, the authors explore situations when big data and social media were used in recent emergency contexts, including the Haiti Earthquake (2010), Chilean Earthquake (2010), UK Riots (2011), and Northern Ireland Floods (2014) focusing on how social media data is collected, distributed, stored, analysed, and disposed of in order to develop situational awareness of the hazard being faced. Other than the more typical ELSI discussions about privacy, autonomy, and dignity that often come with issues of surveillance, by exploring specific situations from these emergencies when social media got wrapped into emergency response, the authors find that of concern are also questions about the social contract between state and citizen, the nature and quality of democracy and due process, as well as social integration. Jasmontaite (2015), Dimitrova and Jasmontaite (2015) , Liegl and Oliphant (2015a) and Galdon Clavell, Arroyo-Moliner, and Sanz Pascual (2015) show that surveillance and monitoring happen in unintended ways, via technologies intended for other purposes, and in ways that turn the gaze back onto the responders just as much as the affected publics.

While Galdon Clavell, Arroyo-Moliner, and Sanz Pascual look at how data gets 'thicker' with the inclusion of the visual medium and incidental data, Liegl and Oliphant look at how, once this is logged it has an air of completeness or even over-completeness, but in fact, it demonstrates itself to be thin. They ask: What kind of contextual information (rather than demographics) is required for fairness in assessment to be achieved?

Rizza transposes the analysis and instead of looking at the ELSI within how social media is used in crisis situations, she discusses how these media themselves identify and manage ELSI. By examining the narratives within social media during the Chilean student led-protests of 2008 and 2011, the Vancouver Riots of 2011, and the Genoa floods 2011, Rizza finds that the ELSI are all related to the unintended – both positive and negative. Social media unintentionally create socio-technical configurations that mobilize students against censorship within mainstream media; these unintentionally opened up the space for vigilante justice; unintentionally empowered citizens to organized rescue operations. The narratives

in each of these cases all point to unexpected ethical and legal consequences of socio-technical configurations around social media, consequences that need to be considered in greater detail in order to better foresee what might come next.

Leese (2015) revisits surveillance, as he targets discrimination as another issue that arises from monitoring technologies and automatic data processing. Focusing on early warning systems, he demonstrates the value of tracing ELSI narratives not only through pre-defined ELSI check-lists but also through prolonged dialog running alongside the innovation process. Bringing into focus questions of inclusion and exclusion, fairness, and justice, he examines how these issues were discovered and dealt within the EU funded project Alert4All. Throughout the process of designing a new system, the project team found claims to reach the greatest number of citizens with alert messages to be ethically quite problematic. Drawing upon ELSI that emerged in interaction with an ethical advisory board, they discerned many issues of discrimination, including people with disabilities, different languages, and reduced mobility. By tracing the advisory board's narratives of experience, they were also able to identify instances when complete inclusion might not be politically desirable, and to understand the ethical problem as one of a more nuanced nature. This made it possible to see that a solution might be found in changing the pathways of communication, including the modalities in which information is distributed (e.g., visually and not just orally). The contradistinction of this conclusion with the issues raised by Liegl and Oliphant who find that this type of data provides a false sense of completeness, demonstrates the challenges of finding singular, precise definitions and answers for ELSI which could be easily transformed into more generally applicable algorithms and taxonomies.

Kumar and Mishra (2015) approach ELSI from a more meso-scale of data sharing -- gathering and sharing information about affected communities – to offer another narrative where 'including everyone' is a complicated and not always most ethically correct solution. They also remind us very pointedly that bias is not always on the part of the responders; sometimes the responders have to negotiate biases built into the communities they are trying to serve. During the 2013 Uttarakhand Floods in India, efforts of getting up-to-date and accurate baseline information about the socio-cultural context of the emergency was difficult for the first responders, as they consulted with community members and village heads. They encountered biases within the communities, not just amongst the responders or inadvertently 'built into' the gathering technologies. For instance, communities might have more detailed data regarding specific members of the community who have greater power, who are community leaders or those with voices that come from specific demographics that have the power to influence the description of needs. There are also members of the communities whose voices are unnoticed or even silenced. Decision-makers must then balance the inaccuracies and assumptions built into their own data with inaccuracies and assumptions built into data they are gathering from the communities in order to strive for fairness. Ethically, inclusion needs to be achieved, but socially, there is a delicate game that needs to be played to manage the cultural issues of social stature. This gets even more complicated when aid comes as cash, and questions emerge about what is considered 'equal' treatment. Is it equal treatment to give everyone the same amount of money, regardless of their present income status, or is it equal to make sure everyone has access to necessary funds for survival, which means some might get more cash than others? Focusing on these issues of community demographic data gathering and aid distribution during the floods makes visible, echoing concerns raised by Leese, how the most basic ELSI terms cannot be reduced to a check list, as the meanings and intentions are not unproblematic. Here, the quality of fairness rides on the particular definitions provided in relationship to bias, justice, and equality.

DISCUSSION

The goal of the workshop is to compile, debate, compare, contrast, and map detailed descriptions of ELSI in disaster response and IT use for consideration in the design of new emergency response ICT as well as for sharing with the larger emergency response community. The contributors bring together studies from different perspectives and different places and show how challenging decisions arise in practice in the field. The contributors are ethnographers, qualitative researchers, sociologists, legal scholars, IT designers and practitioners who document and reflect upon observations of ELSI and consider the implications of technology design. Key issues raised resonate with debates in different research

fields, including:

- Critiques of visual 'evidence' and the trap that false impressions of 'completeness' and objectivity pose for situation awareness (Suchman, 2015)
- Calls to critically examine our own assumptions and understandings of autonomy, control and responsibility, to develop better ideas of when and why new versions of these ideas are enacted and what their consequences might be (Suchman and Weber, 2015).
- The paradox of privacy as conceptualized as a quality that provides security by building walls and a contextual practice that enacts liberty by providing individuals with the discretionary freedom and capacity to move and disclose in digitally augmented environments (Büscher, Perng and Liegl 2015).
- Debates on *what* an emergency is, *who* has the authority to define it and *which* emergency measures are justified in which situations, bringing to focus the importance of asking *how* ethics work in disasters in ways that make it possible to synthesize emergency power and liberal democracy (Campbell, 2012, Kerasidou, Buscher, Liegl, Oliphant, 2015)
- Studies of technology and their users that demonstrate that technologies do not exist independently from their situations of use; that technologies are made sense of – through design and use (Woolgar 1990, Ehn, 2008, Feenburg 2010).
- Critical engagement with tools that make shared action possible, that explore how the norms of society and value systems are situated in specific events, places, and times, as well as the work being asked of the people and the information (Bowker and Star 1999).

ELSI opportunities and barriers are currently ill understood and not addressed with sufficiently creative and serious ambition, and not in a way that integrates social and technical innovation. With this workshop we aim to intervene in these debates and practices to critically engage with the notion of "making IT work" in a manner that responds to ELSI as part of the socio-technical innovation as a whole, from design conception to final use patterns, as opposed to something that can be seen only in the consequences of use.

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REFERENCES

1. Bowker, G. and Star, S. L. (1999) *Sorting Things Out: Classification and Its Consequences*. Cambrdige, MA: MIT Press.
2. Büscher, M., Perng, S-Y., Liegl, M. (2015) Privacy, Security, Liberty: ICT in Crises. *International Journal of Information Systems for Crisis Response and Management (IJISCRAM)* (forthcoming)
3. Campbell, T. (2012) *The Library of Essays on Emergency, Ethics, Law and Policy: 4 Volume Set on Emergency Ethics, Emergency Law, Emergency Policy, Emergency Research Ethics.* Ashgate.
4. Dimitrova, D. and Jasmontaite, L. (2015) Data protetcion challenges to mobile disaster management. ELSI Narratives Workshop, ISCRAM 2015.
5. Ehn, P. (2008) Participation in Design Things, PDC '08 *Proceedings of the Tenth Anniversary Conference on Participatory Design*, 92–101.
6. Feenberg, A. (2010) Ten Paradoxes of Technology, Techné 14, 1.
7. Galdon Clavell, G., Arroyo-Moliner, L., Sanz Pascual, E. (2015) The use of social media surveillance in disaster management contexts: Using societal impact for benefits and pitfalls assessment. ELSI Narratives Workshop, ISCRAM 2015.
8. Gimenez, Labaka, Sarriegi, and Hernantes (2015) Which Challenges do members of a VcoP encounter to share information on past Disasters? ELSI Narratives Workshop, ISCRAM 2015.

9. Jasmontaite, L. (2015) Finding legitimate ground for the processing of personal data of affected persons: First respodners face uncertainty. ELSI Narratives Workshop, ISCRAM 2015.
10. Kerasidou, X., Buscher, M., Liegl, M. Oliphant, R. (submitted 2015) Emergency Ethics, Law, Policy & IT Innovation in Crises. *IJISCRAM* (under review – available from m.buscher@lancaster.ac.uk)
11. Kumar, A. and Mishra, G. (2015) Ethical, social problems from the field experience of the Uttarakhand floods. ELSI Narratives Workshop, ISCRAM 2015.
12. Leese, M. (2015) Discrimination issues in alert and communication design. ELSI Narratives Workshop, ISCRAM 2015.
13. Liegl, M. and Oliphant, R. (2015s) Logging, surveillance and the question of autonomy in emergency response. ELSI Narratives Workshop, ISCRAM 2015.
14. Liegl, M. and Oliphant, R. (2015b) Automation, responsibility and control in actor-agent processes and system of system architectures. *ELSI Narratives Workshop, ISCRAM 2015*.
15. Suchman, L. (2015) Situational awareness: Deadly bioconvergence at the boundaries of bodies and machines. *MediaTropes eJournal* Vol V, No 1 (2015): 1–24.
16. Suchman, L. and Weber, J. (2015) Human-Machine Autonomies. Paper presented at the symposium 'Autonomous Weapons Systems – Law, Ethics, Policy', 24-25 April, European University Institute, Florence https://www.academia.edu/9659770/Human-Machine_Autonomies [Accessed 6/03/2015]
17. Woolgar, S. (1990), Configuring the user: the case of usability trials. The Sociological Review, 38: 58–99.