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Rattay, Sonja; Vakkuri, Ville; Rozendaal, Marco; Shklovski, Irina

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Moral Stress in Technical Practice: The Affective Experience of Ethics Tools

Sonja Rattay
srr@di.ku.dk
University of Copenhagen
Copenhagen, Denmark

Marco Rozendaal
m.c.rozendaal@tudelft.nl
TU Delft
Delft, Netherlands

Ville Vakkuri
ville.vakkuri@uwasa.fi
University of Vaasa
Vaasa, Finland

Irina Shklovski
ias@di.ku.dk
University of Copenhagen
Copenhagen, Denmark, Linköping University
Linköping, Sweden

Abstract

Ethics toolkits, checklists and workshops are intended to help integrate ethical considerations into the design of data-driven systems. Yet little is known about what long-term effect such integrations might have. We conducted an ethnographic investigation of the adoption of an internal ethical toolkit in a major European city organization. We find that neither toolkit designers nor organizations that implement these, pay attention to the affective experience and emotional costs of integrating ethics toolkits into technology design team workflows. We demonstrate how moral awareness, while necessary for moral technical practice, also leads to unaccounted moral stress for practitioners.

CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**; • **Social and professional topics** → *Codes of ethics*.

Keywords

Ethics in practice, AI Ethics, Moral Stress, Ethical Sensitivity

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1 Introduction

There is a vast number of value sets, toolkits, and workshop formats available to help technologists consider potential ethical challenges involved in the design and development of data driven systems [21]. Such tools attempt to explore risks, limit harms, map unintended consequences, and support value alignment in the context of technology development and innovation processes [5]. While there

many studies exploring how AI designers and developers routinely engage with the ethical challenges of their work [6, 11, 16, 32, 33], little research has been able to assess how integration of ethics toolkits and other interventions may impact technical practice long term. Where studies have been conducted, the prominent finding has been a lack of impact [18, 34]. Yet the demand for addressing ethical quandaries is made only more acute through increasing regulatory pressure especially in Europe. As a result, many public and private organizations continue to seek and implement tools and interventions that might help address ethical concerns in their technological innovation processes.

We conducted an ethnographic study with a major European city, to investigate what happens when a development team working in a smart city environment integrates a value-oriented toolkit in their everyday work, as they design, develop, and implement data driven technologies (we will use the term “design of AI systems” to refer to this process throughout the paper). We find that developers in our study must find ways to cope with the uncomfortable feelings that arise from identifying and engaging with challenging moral situations. Such moral stress [27] is an aspect of emotional labor that affects the outcomes of ethical toolkit implementation in practice.

2 Background

The gap between AI ethics principles and practice is extremely well documented [9] and there is consensus that crossing this gap is a non-trivial problem [22]. Interviews with industry leaders report that lacking awareness and feasible practices are a challenge [17], and that ethics efforts are perceived to be in tension with industry structures and values such as technological solutionism and market fundamentalism [17, 19]. Scholars of ethics in practice [8, 25, 26, 29] argue against a too individualized approach to ethics. Rather ethics can be seen as a relational practice, where responsibility lies between the technical experts and the organizational structures within which they operate [15]. Research on ethical sensitivity [31] recognizes that practitioners already are ethical, aiming to understand when and how ethical decisions are being made and considers what this means from a situated and embodied perspective [10, 23, 24]. Yet ethical sensitivity has been mostly researched as a property of individuals, while technology design typically happens in teams and collaborative structures [3].

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One of the goals of ethical toolkits is to expand the worldview of developers and designers, enabling greater ethical sensitivity. Such capacity to recognize potential ethical challenges has been researched in many different fields and is often portrayed uncritically as a desirable quality [10, 14, 27]. Ethical sensitivity enables people to recognize ethical concerns that need to be addressed but does not necessarily correlate with action. In situations where moral action is difficult to achieve for whatever reason, such recognition can translate to emotional overload [31]. Balaam and colleagues [2] discuss the relevance of design researchers becoming aware and developing strategies for the emotional experiences they encounter through their work with ethically tense areas of investigation. In particular, the authors highlight that this kind of emotion work comes at a cost, where the outcome of deep reflection on relational aspects can lead to feelings of guilt, self-blame, and emotional exhaustion. We tie the discussion around the relevance of emotion work in HCI with the increasingly surfacing ethical dilemmas in the design of data driven system through the lens of moral stress.

2.1 Moral stress and its consequences

Moral stress is a well understood outcome of ethical sensitivity when the mismatch between people recognizing ethical issues and their capacity to redress these causes stress and can lead to failure to respond in morally relevant situations [27, 28]. The concept of moral stress, its antecedents and outcomes are well researched in several different fields, where work load, time pressure, and role ambiguity are cited as the most common [13, 20]. In nursing studies, for example, moral stress is observed when an individual finds that the constraints of nursing work, such as the lack of time, supervisory reluctance, or institutional policy, limit or prevent capacity for moral action [7]. In management studies moral stress is described as the weight of having to make morally relevant decisions. It occurs when there is a discrepancy between individual and organizational goals or views of the right actions. The discrepancy can come from choosing between what are seen as right and wrong actions, but it can also occur when choosing between two legitimate but contradictory right options or two options that appear equally wrong [28]. Research on moral stress agrees that such stress is an inevitable part of morally relevant decision-making processes. More importantly, when overlooked, the experience of moral stress is reported to lower the quality of patient care or management decision-making, can result in avoidance of morally relevant situations, and can even lead people to change work place or occupation [20]. The design and development of data-driven technologies is increasingly becoming a morally charged space. It therefore makes sense to consider whether concepts like moral stress can help us understand the dynamics around implementation of ethical interventions.

3 Our case and methodology

In the fall of 2023, we conducted an ethnographic investigation in collaboration with a European city that developed a framework for the integration of a responsible data manifesto into innovation practices. For the sake of anonymity of the teams we collaborated with, we will only describe the framework structure to provide context for our observations. The framework was structured as follows: A set of principles for the responsible use of data in the

development of data driven systems was developed in collaboration with citizens, businesses, and governmental bodies. A team of designers and ethics specialists then developed a workshop format to provide teams with support on how to translate these principles into practice. The process is kicked off with a long initial workshop led by a trained expert, where teams familiarize themselves with the principles, tools, and the workshop mechanics and are encouraged to select one person within their team to take ownership of the teams engagement with the principles going forward. The teams are encouraged to run their own workshop sessions internally as they see fit - in the beginning of projects to align on concerns and plan according actions, and during projects to reflect on ongoing developments. Activities of the workshop sessions include discussions of the principles in relation to the project being kicked off, mapping of potential actions to take in order to address concerns, and weighing of those potential actions in regards to their relevance, feasibility, and perceived importance.

The first author worked with two teams in the city for 5 weeks in person and attended meetings and sessions online for an additional three months before and after. During this time, they conducted interviews with all team members and attended regular and extraordinary team sessions such as stand ups, sprint planning, team retrospectives, and task refinement sessions. In total, the first author conducted 13 formal interviews, attended 30 team meetings, and 15 other non-team specific meeting sessions. At the start of the study, one team and parts of the second team had already attended the initial training workshop and selected a team member as *Ethics Owner*¹ [19]. The first team ran a few workshops for different projects by themselves, which the first author attended. Throughout the stay, the first author kept a diary for daily note taking and reflections. The research team maintained a weekly correspondence, engaging in joint discussion and reflection over email to facilitate ethnographic theorization [4]. In addition to mapping the logistical challenges, we paid attention to the emotional layers that shined through in the team members communications and actions.

4 Findings

Throughout the research we noticed that while the first author was impressed with how well the team had integrated the ethics tools into their daily practice, the team appeared to feel that they were not succeeding in this effort. In what follows below, we describe the difficulties they experienced as they negotiated what they identified as potential ethical challenges.

4.1 Integrating the tools

The data engineer who took on the role of the *Ethics Owner* in the first team is responsible for organising and facilitating recurring sessions of the workshop format the city designed, and later to integrate the outcomes of these workshops into their backlog of tasks. She feels that the process works pretty well, in the sense that the team engage with the materials continuously, even if encountering some logistical and structural challenges along the way. She also thinks the team trusts each other with being diligent in fulfilling

¹The team uses a different term to describe this role, however we were explicitly asked not to use the team's term. We therefore use the term *Ethics Owner*, defined by [19], as it is similar in meaning.

the tasks to their best abilities. Others in the team appreciate the way she translates the abstract discussions during the workshops into concrete and actual tasks for them to act on. Despite doing a good job by all accounts, the data engineer has issues with her role: “I really don’t like the term *Ethics Owner*. It feels heavy. I am the kind of person when I have responsibility, I take it very seriously. So if you call me *Ethics Owner*, it is just too much on my shoulder.” While the team members embrace the tools and experience support and openness within the team when facing doubts and insecurities, the affective experience of integrating the ethical work into their everyday processes nevertheless creates an emotional strain on the participating team members.

The heaviness that the engineer notes is a byproduct of the individualized responsibility for morality that she takes on in the role of the *Ethics Owner*. Even though she is personally invested in addressing ethical issues and cares about these dilemmas a lot, being put into a role of responsibility for moral conduct comes with the emotionally charged labor of moral judgement. She works to create explicit ties between the values and concrete tasks that she can put on the backlog for the next team sprint as the best way to integrate the responsibility as shared, “normal” work rather than special efforts. In this way, she also takes on a care role for the team - her efforts of making the outcomes fit with the given structures as well as facilitating the conversations in the first place require more relational labor than a standard data engineering role. By integrating the ethical considerations into existing flows and vocabulary, the work becomes more compartmentalized and less charged. However, due to their fuzzy nature, ethical dilemmas are inherently tricky to fit into the concise boxes of agile task management, especially if project requirements haven’t been clearly defined by upper management with regard to the desired values and dilemmas haven’t clearly been named.

4.2 Encountering ethical dilemmas

The team identified an ethical dilemma in a computer vision project. In an attempt to gather more information about the accessibility of the city public infrastructure, the team worked on a model to help measure the real width of sidewalks. While sidewalks are planned with a certain width by city planners, this is later compromised by additions of permanent fixtures such as polls, trees or signs, or temporary obstacles such as roadworks, wrongly parked vehicles or trash. The project was intended to enable support for people with mobility impairments who rely on wheelchairs or other mobility assistance mechanisms and require a particular width to maneuver. Having developed the model however, the team realised that the tool they created also brought up a number of questions about surveillance. Aside from estimating sidewalk widths, the algorithm could pick up on minor digressions such as mis-parked bikes and misplaced flower pots.

While trying to create a system that would provide one group with more useful information about the city infrastructure, the team realized that they unintentionally created a system that would also be able to inform on minor rule breaking by others. Reflecting on this project in particular, one of the data scientists worried: “We were so well meaning, so well-intentioned, and afterwards I thought, oh, should we even do this?” Of course, just because an

algorithm can be used in such a way doesn’t mean it will be. The team put extra effort into ensuring that such potential misuse is recognised, so that it could be curbed proactively. However, given that the teams also want to be transparent about the models they develop, and potentially share algorithms with other parties, such worries are potent. “We, as a team, have the same responsibility [as all civil servants to raise issues and concerns] and maybe even a stronger responsibility when it comes to AI” stated the team lead. Concerns and actions are however not always necessarily correlated, particularly in cases where the encountered dilemmas have many sides to them, such as weighing information about accessibility related versus surveillance concerns. “The less clear cases are, of course, the ones with more vague ethical feelings that you might have about something where, you know, you could somehow frame it in a way that meets all the official regulations, but still, your gut feeling says that it’s not a great idea” the team lead continues “In the end, it’s going to be a sort of political choice that a manager at some point needs to sign off on.” The “term political choice” has a rather specific meaning in a municipal context, highlighting tensions between capital P Politics (as in political programs developed by parties) and small p politics (as in implicit value judgements about who and what to prioritise). Capital P “Political Choices” can only be made if there is explicit mandate to do so, and such choices get escalated back up to the political decision layer where that is the case. “Political Choices” are by definition decisions that civil servants cannot make on their own. The tensions arise in differentiating when a dilemma is a managerial (political) choice, and when it is a Political Choice.

5 Ethics in practice: the challenges of moral stress.

As Metcalf [19] argued, aside from needing the necessary resources (such as usable tools and the time to engage with them within existing work structures), practitioners also need to be emotionally invested in the ethics initiatives organisations want to establish. In our study, the combination of an emotionally invested team and an actionable toolkit provided a good example of an ideal case, where such emotional investment and resources fit well together. Yet our observations indicate that even well-developed interventions have significant and uncomfortable emotional effects on teams who are becoming ethically aware and engaged, finding themselves faced with many challenges and few certainties. One main tenet of ethical toolkits is to provide scaffolding for deeper reflection on the social, political, ecological, and economic impacts of tech work beyond the primary goals of utility and efficiency. The reflections sparked by the ethics workshops in our study created moral awareness [14, 27], helping the technologists to see new aspects of their work and to give weight to moral considerations in their choices. While many ethics studies and toolkits in the tech field refer to moral (or ethical) awareness or sensitivity as one of their intended goals [1, 12, 30], both the tools and the research tend to overlook the emotional effects of moral awareness. While higher moral awareness results in more self-reflective behavior, it will also make people more self-conscious and uncertain of their actions [27]. In our findings we observed two tensions that allude to the technologists experiencing moral stress.

First, ethics tools are a moral comment on the existing practices. Introducing new ethics-oriented practices poses the question on whether work was morally lacking before. Will ethical reflection improve the resulting work and products because they receive an ethical upgrade, or did the people have shortcomings before and are better trained now, in which case the question would be better trained for what? Asking technologists to reflect upon their work demands them to face and recognize potential wrongdoings in the past and to respond accordingly as a consequence of reflection [27]. Integrating such recognition into their future work, demands emotional labor from the team members individually and collectively, working out the boundaries what they, as a team, might deem morally acceptable, in order to accommodate a shifting perception of their roles and responsibilities. Popova et al. [23] refer to three relational stances on ethical responsibility: the I-stance, where people take full individual responsibility for both actions and consequences, the we-stance, where people count themselves within a group of people responsible, and the they-stance, where others are assigned responsibility. The Ethics Owner as a role navigates the tension between taking individual responsibility for the ongoing engagement of the team with the ethical toolkit, but not necessarily the outcomes in the sense of moral decisions. The developer who took the role in this case study however, states that she tends to take this responsibility very seriously, thereby adding weight to the meaning of the role. The team as a whole straddles the tensions between their responsibility as a "we" of different configurations - both as civil servants and as a team with high technical expertise - and the responsibilities of others that are potentially part of the "we" (as civil servants) or not (when they are not technical experts). This straddling highlights the importance of relational configurations on the experience of moral stress, and emotions such as self-doubt ("should we even do this?") or guilt ("vague ethical feelings").

Second, reflecting on and recognizing the multi-layered character of tech work (such as reflections on trade offs between different affected citizen groups, legacies from other areas of city planning and dependencies on other political agendas) is always going to lead to a position of "what now?" where people must make decisions, take stances, and coordinate actions. The ethical toolkit used in this study - and we would argue many similar toolkits - offers little support for concrete action, but creates new social and emotional "costs" - trade-offs the teams encountered in their everyday work to fit the outcomes of the ethics workshops into their practices. Such costs can be logistical and procedural, such as spending more time and money on a project to accommodate additional work or changed features. In case of project course corrections, such costs can be political, in that the team needs to put extra effort into negotiating and convincing across layers of hierarchy. If neither project modifications nor course corrections are possible or feasible, the team needs to compromise on their own ethical standards, leading to the emotional costs of compromising personal values. These costs lead to moral stress which expresses itself as feelings of discomfort, vulnerability, and exposure. Such feelings are part and parcel of the inherent doubts and uncertainties of ethical decision making [29]. Moral stress occurs when a person realizes that they need to make ethical decisions but there is a mismatch between expectations and possible actions [28]. This can happen when a

person makes a moral decision to act but is prevented from following through due to circumstances beyond their control, or when results of reflection conflict with existing practices [28], such as the case in which political choices and Political Choices have to be calculated. Feelings of vulnerability then are more than "an active ethical stance" as Popova and colleagues argue [24]. Rather, they are endemic to making ethical considerations explicit in technical processes and practices, and require intentional training, in order to engage with these experiences not naively but intentionally [2] to avoid resignation [7, 13].

6 Conclusion

In this paper, we discuss the affective experience of integrating ethics driven interventions in technical work practices. Even when toolkits are designed with logistical necessities in mind, and technologists are emotionally invested and motivated to "do the right thing", ethics interventions require emotional labor and produce moral stress in the form of vulnerability, discomfort, and other difficult emotions. Ironically, interventions such as ethical toolkits consider their recipients as disembodied, impartial actors, who can engage with and work through the expected processes of reflection, identity work, and required action without any emotional reaction to the necessary shifts of perspective and awareness of positionality and responsibility. We argue that a successful and sustainable implementation of ethics initiatives requires accounting for the inevitability moral stress [28]. Teams that embrace moral awareness and attempt to influence organizational decisions accordingly will often encounter barriers that lead to frustration, disengagement, and stunted impact of any intervention that aims to develop moral awareness without political reach. Future research could explore how ethics initiatives address the socio-political dimensions of organizational practices and consider practitioners' emotional needs when facing ethical tensions and uncertainties.

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